

Canadian Agri-Food Processing Competitiveness, Quality Growth and Global Opportunities: A Snapshot of Current Trends Key Findings



Paper prepared for CAPI

by

Shelley Thompson, Ted Bilyea and Margaret Zafiriou

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The Canadian Agri-Food Policy Institute

960 Carling Avenue, CEF Building 60

Ottawa, ON K1A 0C6

Telephone: 613-759-1027

www.capi-icpa.ca

Canada

Canadian Agri-Food Processing Competitiveness, Quality Growth and Global Opportunities: A Snapshot of Current Trends- Key Findings

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Authors

Shelley Thompson, Ted Bilyea and Margaret Zafiriou

CAPI Project Management Team

Don Buckingham, Tulay Yildirim, Margaret Zafiriou, Elise Bigley

The views and opinions expressed in this paper are solely those of the author and do not necessarily reflect those of CAPI.

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1.0 Background and Introduction

In 2017, the Advisory Council on Economic Growth (ACEG) (aka Barton Report) identified Canada’s agriculture and agri-food sector as a key strategic growth sector with “a strong endowment and untapped and significant growth potential.”¹ The ACEG set an ambitious growth target for the sector, including a goal of \$75 billion (B) in agri-food exports by 2027. One third of the growth in exports (\$11 B) would come from agricultural exports, with the balance of the growth (\$19 B) from value-added food processing. The growth target was subsequently increased to \$85 B by the Agri-Food Economic Strategy Tables (AFEST) in 2018.²

The Canadian Agri-food Policy Institute (CAPI) held several dialogues to study the challenges, risks and opportunities associated with achieving these growth targets, with the participation of industry, NGOs and government stakeholders. CAPI concluded that the sector should aim for “optimizing” growth, which would allow Canada to maintain its natural capital at the same time as the growth targets were being achieved.³

In addition, in 2019, the Standing Senate Committee on Agriculture and Forestry (SSCAF) studied the value-added food sector and recommended that if Canada is to become an important player in world export markets, it must increase value-added growth opportunities.⁴ There is a realization by the sector, however, that to achieve this goal, bold new steps and ways of thinking are required. This is particularly the case given recent challenges the sector faces on the trade front from domestic cost pressures and as a result of changing consumer demands. In other words, the industry will need to remain resilient in the face of these challenges if it is to benefit from these opportunities.

The Canadian food and beverage (FB) processing sector has evolved since CAPI first undertook its program of work in 2012-14 looking at the competitiveness of the sector.⁵ This early work was motivated by an alarmingly large and increasing trade deficit in further processed high value-

¹ Advisory Council on Economic Growth, “Unleashing the Growth Potential of Key Sectors”, February 2017.

² Agri-food Economic Strategy Table Final Report (2018). Accessed at: [https://www.ic.gc.ca/eic/site/098.nsf/vwapj/ISEDCAgri-Food_E.pdf/\\$file/ISEDCAgri-Food_E.pdf](https://www.ic.gc.ca/eic/site/098.nsf/vwapj/ISEDCAgri-Food_E.pdf/$file/ISEDCAgri-Food_E.pdf).

³ Canadian Agri-food Policy Institute, “Barton Forward: What We Heard”, June 2018. Accessed at: https://capi-icpa.ca/wp-content/uploads/2018/06/2018-06-22-CAPI-Barton_WhatWeHeardReport_Eng-1.pdf.

⁴ Standing Senate Committee on Agriculture and Forestry, “Made in Canada: Growing Canada’s Value-added Food Sector”, July 2019. Accessible at: <https://sencanada.ca/en/Committees/agfo/Reports/42-1>.

⁵ Canadian Agri-food Policy Institute, “From Record Deficits to Competitive Resurgence”, May 2013. Accessed at: <https://capi-icpa.ca/wp-content/uploads/2013/05/From-Record-Deficits-to-Competitive-Resurgence-2013.pdf>; Canadian Agri-Food Policy Institute, “Taking the Sector from Trade Deficits to a Competitive Resurgence”, June 2014. Accessed at: <https://capi-icpa.ca/wp-content/uploads/2014/06/Taking-the-Sector-from-Trade-Deficits-to-a-Competitive-Resurgence-2014.pdf>.

added food products over the 2004 to 2011 period.⁶ While there is still a trade deficit in certain categories of further processed products, there has been a slight improvement. The challenge is to understand what factors have contributed to this and what the sector can learn for future growth opportunities.

Not surprisingly, some of the key competitiveness challenges the sector faced at that time continue to impede Canadian FB processors' growth. This includes regulatory barriers, labour shortages, tax impediments, and insufficient investments in machinery and equipment, advanced technologies and infrastructure. There has also been a slowdown in inward foreign direct investment (FDI), particularly from the U.S. and a continuation of the mergers and acquisitions that have led to increased concentration and changing players in the Canadian scene. However, while there has been an outflow of some major players from Eastern Canada, such as Kellogg Canada, Hershey Canada and Heinz, the West has seen the arrival of some new FB processors.

This is partly because the Canadian FB processing industry has responded to opportunities arising from changing consumer demands both at home and abroad. FB processors have been investing in new plants to produce plant-based (pea) protein products (e.g. Verdient Foods) and alternative meat products (e.g. Maple Leaf Foods).⁷ They have also been responding to consumers' desire for more sustainable, environmentally-friendly food production practices. As an example, Maple Leaf Foods has committed to carbon neutrality, reducing its Greenhouse Gas emissions (GHG) by 30% by 2030 and reducing its environmental footprint.⁸

At the country level, recent competitiveness indicators for Canada show how its ranking has deteriorated relative to other countries since 2012, when we were 9th in the world, falling to 14th by 2019, according to the World Economic Forum (WEF). Given the importance of trade for the agri-food sector, this raises concerns about the pressures it faces, its overall health and the measures needed to ensure it will remain competitive in the future.⁹

What has become evident since 2012-14 is how the global environment and its underlying assumptions have changed. There has been a dramatic rise in protectionism, a decline in rules-based trade, and a global economic sluggishness that are threatening future growth prospects. These have raised concerns for the Canadian sector with obvious challenges in achieving the

⁶ Canadian Agri-Food Policy Institute, "The State of Canada's Processed Food Sector: Trade Balance", November 2012. Accessed at: <https://capi-icpa.ca/wp-content/uploads/2011/11/The-State-of-Canadas-Processed-Food-Sector-Trade-Balance-2012.pdf>.

⁷ Nunes, Keith. "Maple Leaf Foods to keep eyes on the plant-based prize", *Meat+Poultry*, June 2019. Accessed at: <https://www.meatpoultry.com/articles/21698-maple-leaf-foods-to-keep-eyes-on-the-plant-based-prize>.

⁸ Maple Leaf Foods. Sustainability: Carbon Strategy. Accessed at: <https://www.mapleleaffoods.com/sustainability/carbon-strategy/>.

⁹ World Economic Forum, "The Global Competitiveness Report 2019". Accessed at: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.

value-added growth targets set by the AFEST, and for ensuring the sector’s future growth and sustainability.

Recent trade agreements that Canada has negotiated with Europe (CETA), Pacific partners (the CPTPP), and the United States and Mexico (CUSMA) hold some promise for the future. But Canada must now overcome the emerging headwinds that risk dampening Canada’s export prospects. Diversifying trade and adding more value here at home are solutions that could help address these headwinds, but these will require new strategies and approaches and innovative solutions.

This analysis updates CAPI’s earlier work on the FB further processing trade deficit, while describing some of the challenges and opportunities facing the sector. This includes answering several questions, such as:

- Are the new trade agreements providing opportunities for Canada’s agri-food sector and increasing exports?
- Is the current policy environment supportive of the processing sector?
- Does the sector have sufficient capacity to add more value at home to mitigate against the disruptions in the global trading environment?

The answers to these questions are the focus of this summary of key findings from a larger commissioned study undertaken for CAPI by SJT Solutions.¹⁰ It specifically considers the feasibility of achieving the targets set out by the AFEST and concludes by drawing implications for policy and industry strategies to support the sector’s future growth, competitiveness and resilience in the new world order.

2.0 Structure and Performance

The Canadian FB processing sector is the largest manufacturing sector in Canada, after transportation, accounting for 17% of overall manufacturing GDP in 2017. It is also one of Canada’s largest employers, with 266,000 employees, accounting for 17.6% of total manufacturing employment.

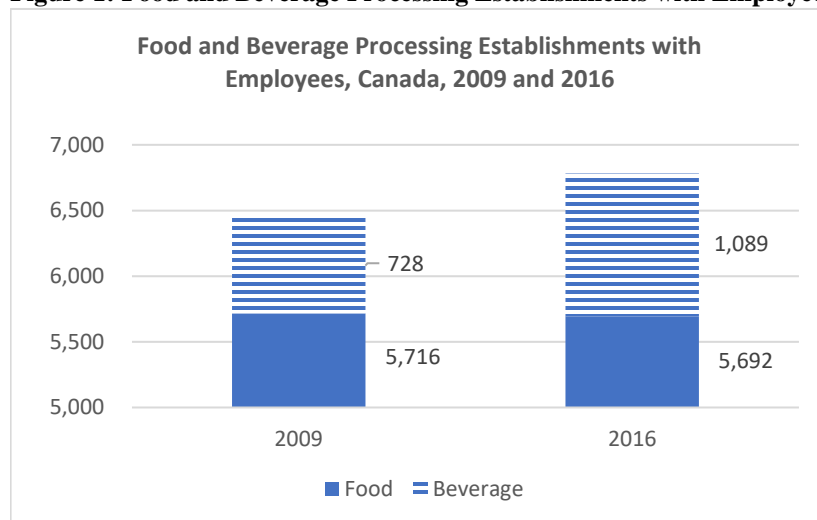
Number of Establishments

Canada’s FB processing sector is growing, but this growth is uneven, with some subsectors and provinces growing more than others. In 2016, there were 6,781 “establishments with

¹⁰ For access to the full report, please contact CAPI at info@capi-icpa.ca.

employees” in Canada’s FB processing sector (including animal food) compared to 6,444 in 2009. This represents a 5% increase over the period (Figure 1).¹¹ The number of food processing “establishments with employees” shrank slightly over that time while the number of beverage manufacturers increased by 50%.¹² The total number of FB manufacturing establishments both “with” and “without employees” in 2016 rose to 9,077 and 1,756, respectively.

Figure 1: Food and Beverage Processing Establishments with Employees



Source: Statistics Canada.

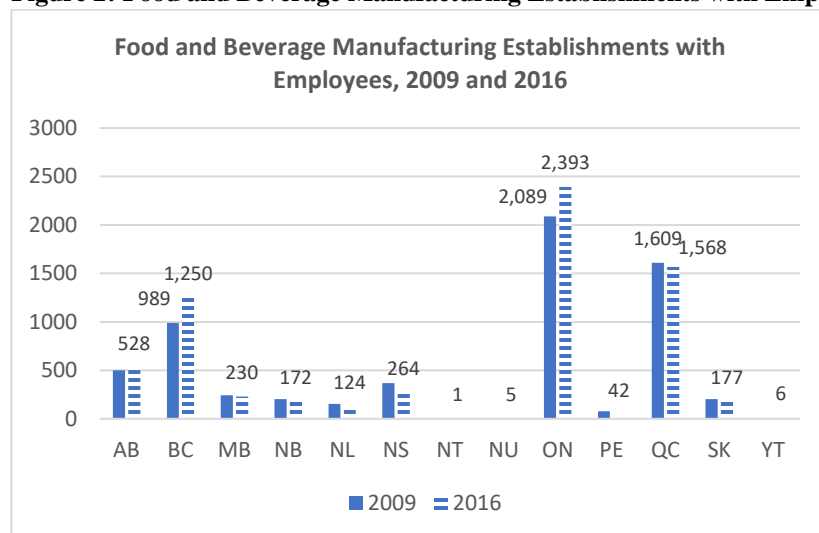
Between 2009 and 2016, Canada saw several key food processors close down operations in Eastern Canada and move facilities to the U.S. This included companies such as Heinz, Kellogg Canada, Campbell Company of Canada, Hershey Canada, and Bick’s Pickles, among others. However, at the same time, there was growth in value-added processing capacity in various provinces, including the construction of new pea protein processing facilities on the Prairies, meat and poultry packing plants in Alberta, Ontario and Quebec, dairy processors in Manitoba and bakeries and beverage plants in British Columbia (BC).

The breakdown by province for 2009 and 2016 is shown below (Figure 2). The number of establishments with employees shrank dramatically in Atlantic Canada, falling from 802 to 602, a 25% decrease. The number of establishments rose significantly in both BC and Ontario while the number in Quebec fell slightly. **Not surprisingly, the bulk of FB manufacturers tend to be concentrated in the provinces with the largest populations, where they are near their markets or distribution centres.**

¹¹ Statistics Canada reports the number of establishments with employees, and without employees. Unfortunately, the latter category is not available for 2009 so it was not possible to compare data. Data for the number of “other food manufacturing (3119)” was also not comparable for 2009.

¹² ISED (Statistics Canada, special tabulation, unpublished data, unclassified excluded, 2016); FPHRC (now FPSC), “Who is Processing Your Food? – 2011 Food & Beverage Labour Market Information Study”.

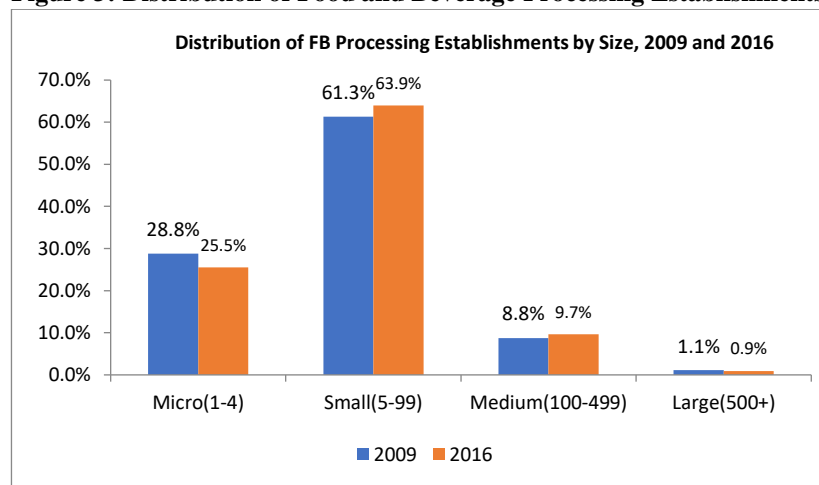
Figure 2: Food and Beverage Manufacturing Establishments with Employees



Source: Statistics Canada.

Looking at size distribution, in both 2009 and 2016, approximately 90% of FB processing establishments were small, with fewer than 100 employees (Figure 3). The significant share of establishments that were small is not unique to this sector. In 2016, 93% of *total* manufacturing establishments with employees in Canada were also small. Bakeries and tortillas manufacturers, as an example, which account for one third of FB processing establishments, tend to be very small.

Figure 3: Distribution of Food and Beverage Processing Establishments



Source: Statistics Canada.

Nevertheless, in many subsectors there are several very large players who dominate FB manufacturing. Some of them are Canadian subsidiaries of American companies. Table 1 below shows the major players in FB processing in Canada in 2010 and 2018, based on revenues. Dairy manufacturers had three of the top ten spots in 2018 with total revenues of \$20.5 B annually. Other major players in the top ten included George Weston Foods (\$48.5 B), McCain Foods Ltd (\$8.5 B)

and Maple Leaf Foods (\$3.4 B). There have been some changes in company profiles over time through mergers, acquisitions, and dispersals resulting in the structural changes we have seen since 2009.¹³ Some of these players have also expanded operations domestically and others have invested abroad to benefit from trade opportunities. Global supply chains which source inputs and export outputs from within Canada and across borders have become the norm with the rise in global freer trade since the 1990s.

Table 1: Major Canadian Food and Beverage Manufacturers

Top Canadian Food and Beverage Manufacturers			
Company	2010	2018	Sector
	B of \$		
George Weston Foods	32	48.5	Baked Goods & Retail (Loblaw)
McCain Foods Ltd	6.1	8.5	Packaged Goods
Saputo	5.8	11.6	Dairy Products
Agropur Cooperative	3.3	6.4	Dairy Products
Maple Leaf Foods	5	3.4	Packaged & Meat
Premium Brands Holding Corp	1.9	3	Packaged Goods
Kraft Heinz Canada (Kraft in 2010)	1.0	3	Packaged Goods
Pepsico Canada	3.2	3.5	Packaged & Beverage
Nestle Canada	2.9	2.6	Packaged Goods
Parmalat Canada	2.2	2.5	Dairy Products
Lassonde Industries	0.5	1.6	Fruit, Beverages
General Mills Canada Corp	.08	1.2	Packaged Goods, Cereals, Snacks
Sunopta	0.9	1.6	Packaged Goods
Rogers Sugar	0.6	0.8	Sugar
Highliner Foods	0.5	1.4	Seafood
Smucker Foods of Canada	0.4	0.6	Packaged Goods

Source: Financial Post 500, various years; USDA, FAS, GAIN Report, “Canada Food Processing Ingredients, Food and Processing Sector in Canada”, 2013 and 2019.

Performance

Given the nature of food demand and its products, FB manufacturing tends to be less affected by economic downturns than other manufacturing sectors. This is because the demand for food does not change dramatically when prices or income swings, unlike furniture or cars, as an example.

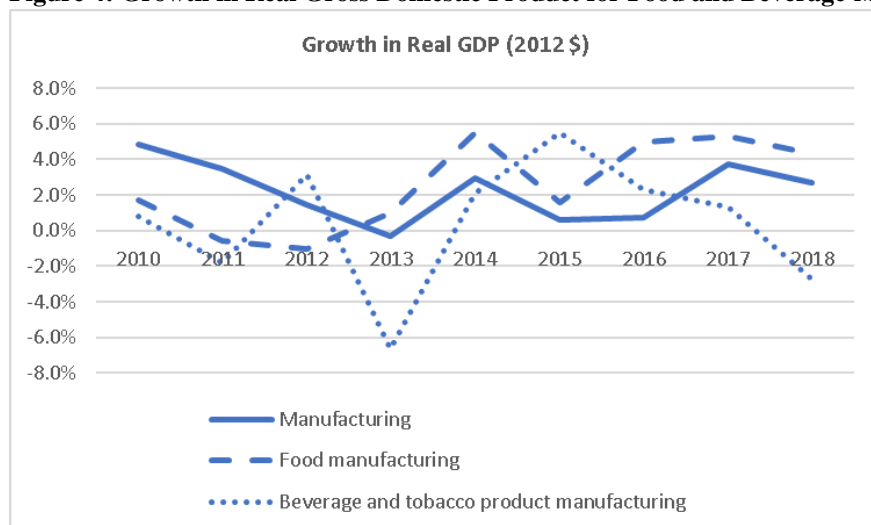
Over the period 2009 to 2018, growth in food manufacturing Gross Domestic Product (GDP) outpaced that of beverage manufacturing and total manufacturing. Annual growth in real GDP (2012 chained dollars) averaged 2.5% for food manufacturing and 2.2% for total manufacturing. Real GDP growth for beverage and tobacco manufacturing grew only 0.4% on average over the period (Figure 4).¹⁴ Given that Canada’s population has been growing by about 1.2% per year, on average, real GDP growth in per capita terms has still been positive.

¹³ USDA, FAS, GAIN Report, “Canada Food Processing Ingredients, Food and Processing Sector in Canada”, 2013 and 2019.

¹⁴ Statistics Canada. Accessed at: <https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=361004340>.

By subsector, grain and oilseed milling grew the most (6.5%) followed by other food manufacturing (5.8%), while meat and dairy processing and bakeries grew more slowly, by 1.6%, 0.6% and 1.6% respectively.¹⁵ FB manufacturing GDP in Saskatchewan, Prince Edward Island, New Brunswick, Quebec and Alberta experienced the highest provincial growth.¹⁶

Figure 4: Growth in Real Gross Domestic Product for Food and Beverage Manufacturers



Source: Statistics Canada.

In 2018, Canadian shipments of food, beverages and tobacco (FBT) were \$117.1B, up from \$98.2 B in 2013.¹⁷ Food manufacturing shipments were \$103.4 B and beverage and tobacco shipments were \$13.7 B in 2018. Both were up significantly since 2013.

Profit margins in food manufacturing, measured by profits as a share of gross income, as an indicator of performance, averaged 2.6% in 2017, compared to -1.4% in beverage manufacturing. However, these profit margin data only cover small and medium-sized enterprises with revenues between \$30,000 and \$5 million and \$5 M to \$20 M respectively, and not large firms with revenues over \$20 million. Hence, it is inaccurate to draw inferences on industry performance for the industry as a whole based on these data.¹⁸ The average profit margin ranged from a low of -11% for small and medium-sized grain and oilseed milling to 5% for fruit and vegetable preserving and specialty food manufacturing. For small and medium-sized beverage manufacturing, only wineries had a positive profit margin.

¹⁵ See Annex A for a description of the FB processing industry subsectors classified by the North American Industry Classification System (NAICS).

¹⁶ For access to the full report, please contact CAPI at info@capi-icpa.ca.

¹⁷ Statistics Canada. Accessed at: <https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=1610011801>. Note: depending on the data series, the most recent year for which data are available varies by time series.

¹⁸ ISED (Statistics Canada, special tabulation, unpublished data, unclassified excluded, 2016).

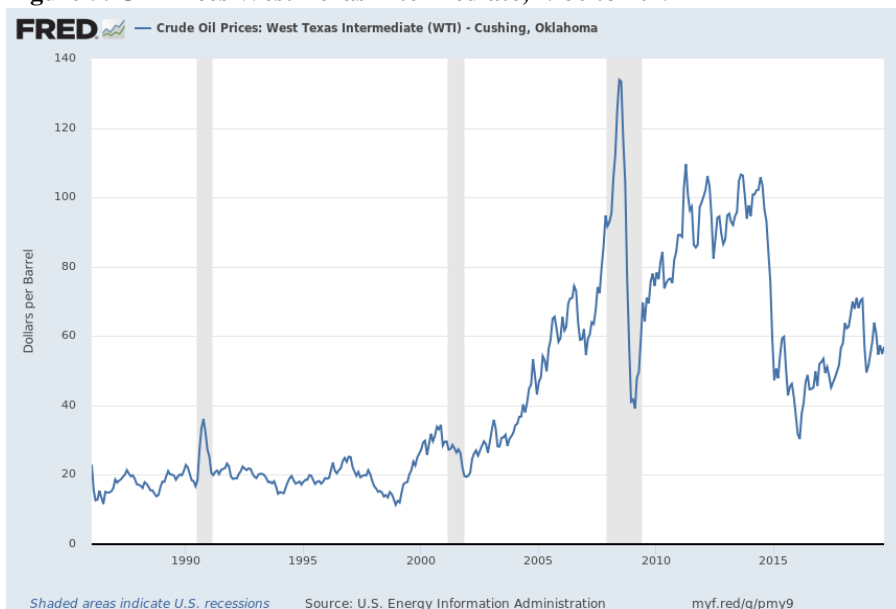
Value-added measures the return to capital and labour and reflects returns after the cost of inputs such as raw materials and energy are taken into account. These data cover all enterprises, small, medium and large. In 2016, food manufacturing establishments (including animal feed) generated an average of \$3.5 M in value-added while beverage manufacturing generated \$4.2 M.¹⁹ Dairy product manufacturing, grain and oilseed milling, meat product processing, and breweries generated the highest value-added per establishment, while wineries generated the least.²⁰

The performance of FB processing establishments can be partly explained by input and output price movements over the period 2009 to 2018. Raw materials and supplies represent about 65% of FB processors' expenses, on average. Hence any price inflation contributes to cost pressures on FB processors. About 40% of domestic agricultural production is purchased by the Canadian FB manufacturing industry as inputs. Over this period, oil prices increased dramatically between 2010 and 2014 before falling back in 2015 (Figure 5). Also, various agricultural commodity prices rose over the period. Figure 6 shows how these raw material prices varied relative to FB manufacturing selling prices. Any large differences contributed to a cost-price squeeze. For most months, the industrial product price index (IPPI), which reflects output (selling) prices for FB processors lay below the indices for raw material prices (RMPI) of crop, animal, and fresh fruit and vegetable inputs. Over the early part of the period, crop prices rose faster than FB processors' selling prices, and in the latter part, vegetable and meat prices rose more quickly. Consequently, for much of the period since 2009, there has been a significant cost-price squeeze facing food manufacturers. The beverage manufacturing sector has been faced with these cost pressures since about 2013.

¹⁹ Value added is a net output measure which measures revenues (after inventory adjustments) net of the cost of raw materials, energy and utilities. It reflects the return to capital and labour.

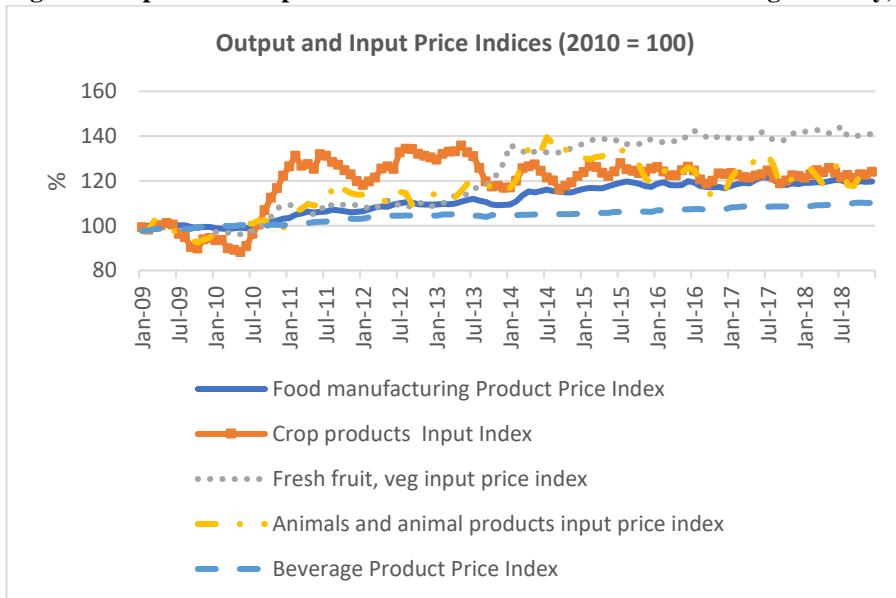
²⁰ GDP and value-added data are for all sized firms, while profit margins are for small and medium-sized establishments. This helps explain why the G&O industry performed well when measured by GDP and Value added, and less well when measured by profit margins: there are some very large profitable canola crushers which are not included in the data for profit margins. Accessed at:
<https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=161001170>.

Figure 5: Oil Prices West Texas Intermediate, 1986 to 2019



Source: Federal Reserve Bank of St. Louis.

Figure 6: Input and Output Price Indexes for the FB manufacturing Industry, 2009 to 2018

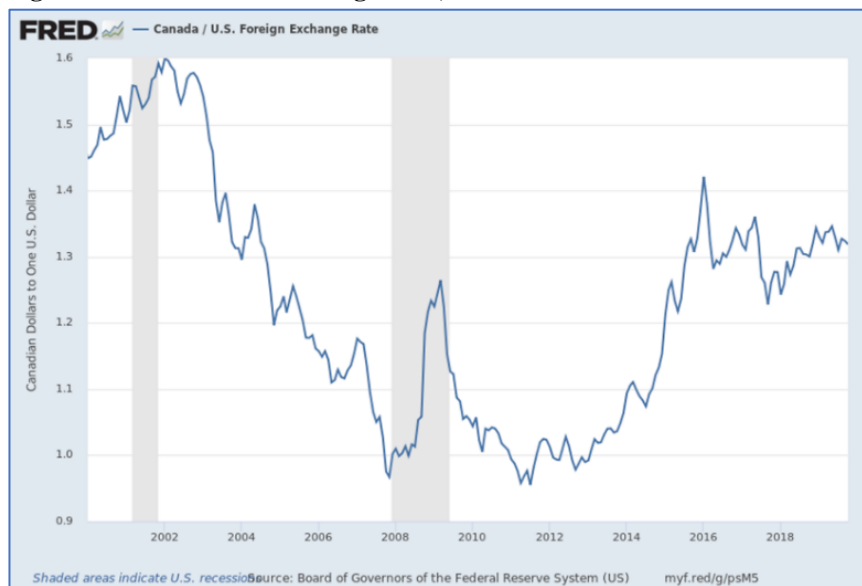


Source: Statistics Canada (<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810003001>, <https://www150.statcan.gc.ca/n1/daily-quotidien/190628/dq190628b-eng.htm>, and <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810003401>).

With respect to other costs, some provinces faced higher electricity prices over this period (e.g. Ontario), while other provinces faced rising taxes, such as British Columbia, which imposed a

carbon tax equivalent to \$10/tonne in 2008, that increased steadily to \$35/tonne by 2018.²¹ In addition, the Canada-U.S. exchange rate depreciated significantly from just under par in 2012 to just over \$C1.34 in 2018 (Figure 7). This has played an important role in Canada’s favourable terms of trade, leading to increased export demand for FB products, especially relative to the U.S. However, a lower exchange rate also contributes to higher prices and hence costs of imported technology and specialized machinery and equipment used by FB processors, much of which is imported from the U.S. and the EU.

Figure 7: Canada/U.S. Exchange Rate, 2000 to 2019



Source: Federal Reserve Bank of St. Louis.

Profitability in FB processing is also impacted by the trade spend, which is the “everyday cost of doing business with customers and the cost of promoting products through retailers” in Canada.²² With the increased concentration of food retailing in Canada as a result of recent mergers and acquisitions (e.g. Loblaws and Shoppers Drug Mart Corporation, Empire Company and Safeway), FB processors have faced higher trade spend. At the same time, the presence of global titans Walmart and Costco in the Canadian food retail marketplace have added to the competitive pressures and made it more difficult for FB processors to pass cost increases through to supply chain partners. This, together with increases in minimum wages in several provinces (e.g. Ontario)

²¹ Government of British Columbia, “Carbon Tax Programs”. Accessed at: <https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax>.

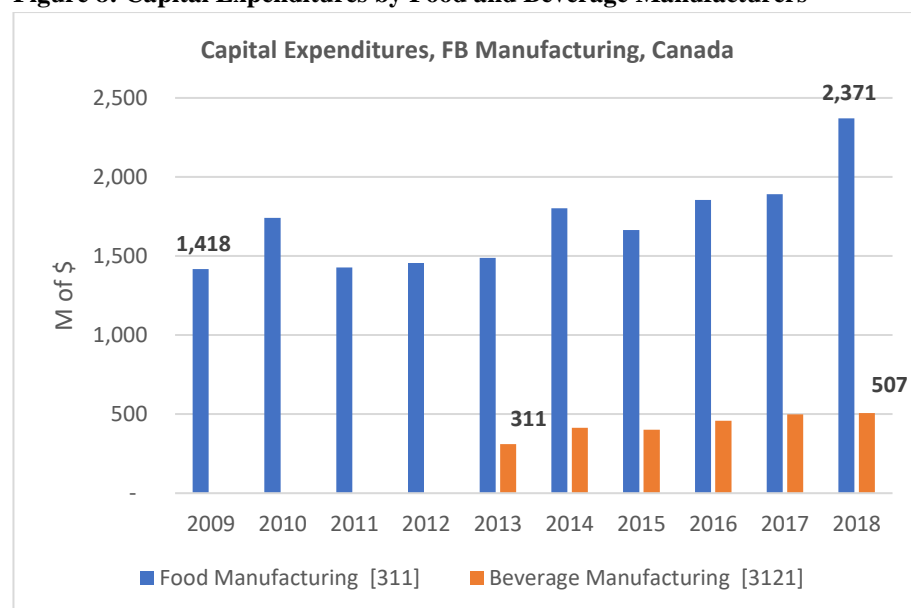
²² Food & Consumer Products of Canada (FCPC), “Industry Sustainability and Competitiveness Study”, November 2018. Available at: https://www.fcpc.ca/Portals/0/Userfiles/PAResources/Public%202019/FCPC%20Industry%20Sustainability%20Study_v1.pdf?ver=2019-04-23-121158-917×tamp=1556036554242.

contributed to the cost-price squeeze for the sector since 2014.²³ In the low-margin environment of FB processing, Canadian players have had to step up their game in order to compete. However, reduced profitability tends to result in lower investment in new technologies and machinery and equipment, impacting future productivity growth and competitiveness.

Capital Investments²⁴

Investments by Canadian FB processors in new machinery and equipment (M&E) and other capital items in Canada are important for the future productivity growth and competitiveness of the industry. In 2018 Canadian food manufacturers spent \$2.4 B on capital investments (Figure 8). Since 2009, these expenditures grew by 5.9% at a compound annual growth rate (CAGR), with a relatively large increase in 2018. Capital spending by beverage manufacturers was only \$0.51 B in 2018, relatively unchanged from earlier years. By province, the largest capital expenditures in food manufacturing occurred in Ontario, Manitoba, Alberta, and Quebec. Ontario and British Columbia saw the largest capital spending by beverage manufacturers.

Figure 8: Capital Expenditures by Food and Beverage Manufacturers



Source: Statistics Canada (<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3410027801>).

²³ Shaw, Hollie, “Loblaw sends strongly worded letter to major suppliers, asks group to lower costs”, Financial Post, July 2016. Accessed at: <https://business.financialpost.com/news/retail-marketing/loblaw-sends-strongly-worded-letter-to-major-suppliers-asks-group-to-lower-costs>. In 2016 Loblaw requested suppliers to reduce prices.

²⁴ Capital investments are reported by Statistics Canada and are measured by flows and stocks of fixed non-residential capital by North American Industry Classification. They include spending on non-residential buildings, machinery and equipment, engineering construction and intellectual property by Canadian enterprises in Canada.

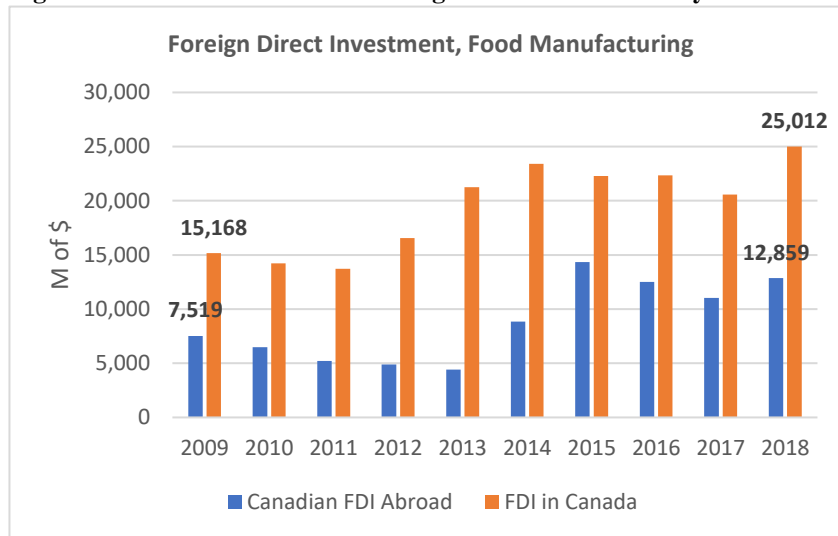
Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) is another source of investment capital for Canadian FB processors.²⁵ FDI takes place when financial capital flows across international borders for investment purposes, leading to controlling interests. It includes “greenfield” investments which are foreign investments in building new plants. FDI can also include investments made through mergers and acquisitions or through owning more than 10% of shares of a foreign interest.²⁶ Hence it is a much broader definition than capital investment, described above. In 2018, Canadian companies invested \$12.6 B in food manufacturing abroad while foreign companies invested \$25 B in Canada’s food processing sector (Figure 9). From 2009 to 2018, Canadian FDI abroad grew at an average annual compound rate of 6.1% while inward FDI to Canada grew by 5.7% annually. Several Canadian FB processors expanded facilities in the U.S. FDI from the U.S. into Canada fell in importance from 65% to 61% of the total over this period (Figure 10) while outward FDI from Canada to the U.S. fell from 71% to 59%. This is because inward FDI from Asia and Oceania expanded significantly over time at the same time as the EU invested in Canadian food processing.

²⁵ FDI pertains to international investments in which the investor obtains a lasting interest in an enterprise in another country. Most concretely, it may take the form of buying or constructing a factory in a foreign country or adding improvements to such a facility in the form of property, plants or equipment. FDI is calculated to include all kinds of capital contributions, such as the purchase of stocks, as well as the reinvestments of earnings by a wholly owned company incorporated abroad (subsidiary), and the lending of funds to a foreign subsidiary or branch. The reinvestment of earnings and transfer of assets between a parent company and its subsidiary often constitutes a significant part of FDI calculations. Source: <https://www.globalization101.org/what-are-the-different-kinds-of-foreign-investment/>.

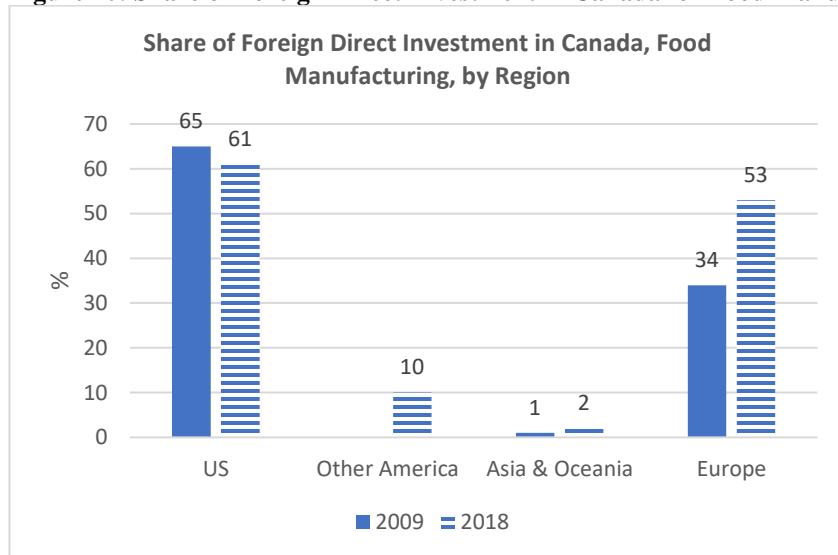
²⁶ Hejazi, Walid. (2010). “Dispelling Canadian Myths about Foreign Direct Investment”. IRPP Study. January 2010. The values reported here measure changes in the stock of FDI in FB processing as of December 31 in any given year.

Figure 9: Inward and Outward Foreign Direct Investment by Food Manufacturers



Source: Statistics Canada (<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610000901>).

Figure 10: Share of Foreign Direct Investment in Canada for Food Manufacturers by Region



Source: Statistics Canada (<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610000901>).

Investments in Advanced Technology

Innovation and investments in new technologies are key to future competitiveness and productivity growth. Innovation includes the adoption of new products, processes and marketing methods and new advanced technologies. A recent Statistics Canada survey on the adoption of advanced technology provides a picture of how FB manufacturing compared to other manufacturing industries between 2012 and 2014. The results show that:

- A smaller share of FB manufacturing enterprises (11.4%) reported investing in advanced technology than did total manufacturing (25.4%);
- More beverage enterprises (20%) had adopted green technologies than did either total manufacturing (13%) or food manufacturing enterprises (10%);
- Larger enterprises (80%) tended to adopt more advanced technologies than did small ones (26%);
- All manufacturers (both FB and total) reported that a key factor impacting the adoption of advanced technologies was the resistance by employees to change;
- Lack of employee training and difficulties integrating new technology into the operation were also key challenges faced by both FB and total manufacturers;
- A major challenge impeding the adoption of green technologies was the low expected return on investment.
- In a more recent innovation survey by Statistics Canada in 2017, both food and total manufacturers reported that the major reason for not adopting or using advanced technology was that the technology was not required for the continuation of operations; and
- The main reason given by beverage (and tobacco) manufacturers was that the technology wasn't applicable to the business.²⁷

Thus, despite the slower rate of investment in advanced technologies by Canadian FB processors relative to total manufacturing, investing in these advanced technologies will continue to be a key driver of the industry's ability to compete and grow in the future.

3.0 Trade and Competitiveness

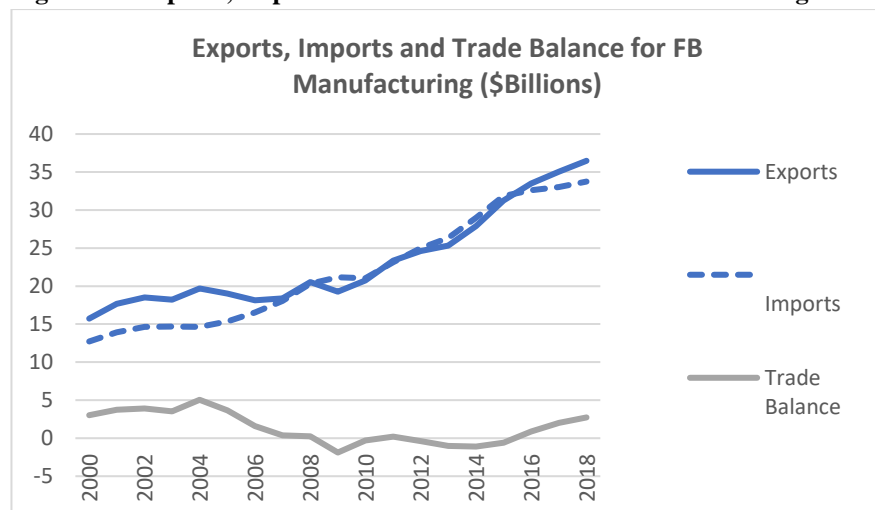
Trade in the FB Processing Sector

To remain viable, the Canadian FB processing sector needs to be able to compete both at home, against imports and in international markets. Canadian FB processors exported \$36.5 B worth of value-added products to various countries around the world in 2018. This includes both primary and further processed products. At the same time, \$34.8 B worth of FB products were imported, leading to a positive trade balance of about \$2.7 B for this sector (Figure 11). Important FB processing industry exports included meat products, grain and oilseed products and seafood at \$7.8 B, \$ 7.7 B and \$4.6 B, respectively. The increase in some primary processing plant capacity, particularly canola, soy and pea crushing on the Prairies has contributed to an improvement. The

²⁷ Statistics Canada. Table 27-10-0368-01 Reasons for not adopting or using advanced technologies by industry and enterprise size.

bulk of FB processing industry exports were destined for the U.S. market, accounting for 71% of the total. This was followed by China, Japan and the EU as important export destinations.

Figure 11: Exports, Imports and Trade Balance for Food and Beverage Manufacturers



Source: Industry, Science and Economic Development (ISED), Trade Database Online.

Compared to other manufacturing industries in Canada, the FB processing sector tends to be less export-oriented, on average. However, certain FB subsectors are more export-oriented than others.²⁸ On average, food manufacturers export about 34% of shipments, while beverage manufacturers export 11% of shipments. The seafood product preparation and packaging sector was the most export-intensive at 89% in 2018. Sugar and confectionery (83%) and grain and oilseed milling (70%) were also highly export-intensive. Meat products (27%) and bakery products (35%) were more average. Breweries (3%) and soft drinks (6%) were the least export-oriented.²⁹ By province, Saskatchewan (62%), Manitoba (53%) and Alberta (41%) had the most export-oriented FB processing industries.

FB Further Processing Trade Deficit

One objective of this study is to update analysis that was undertaken by CAPI in 2012-14 on the trade deficit for further processed, high value-added FB products (i.e. HSIV or Chapters 16 to 22).³⁰ At that time, the trade deficit for these products was deteriorating dramatically, falling from -\$700 million in 2004 to -\$6.7 B by 2012 (Figure 12). There were serious concerns about the

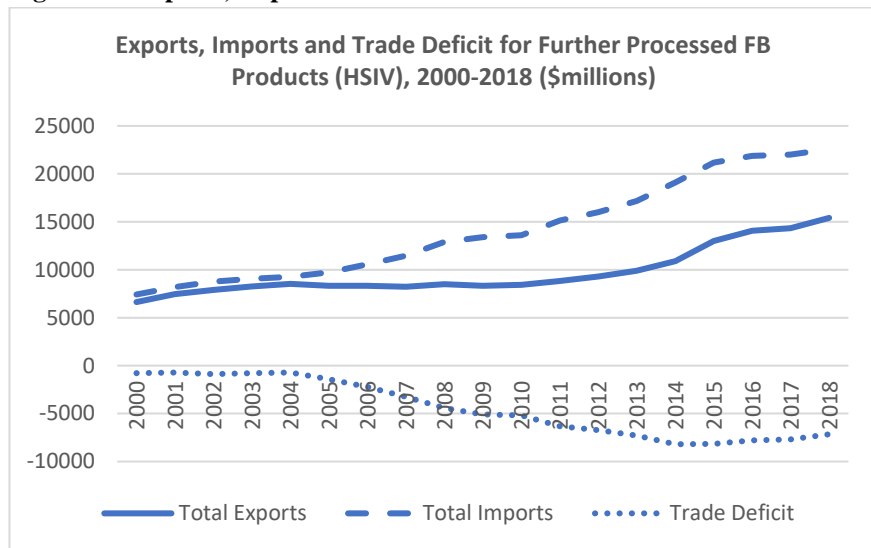
²⁸ Export intensity is measured by exports as a share of shipments.

²⁹ Statistics Canada. Table null Manufacturers' sales, inventories, orders and inventory to sales ratios, by industry (dollars unless otherwise noted) (x 1,000).

³⁰ Canadian Agri-Food Policy Institute, "Taking the Sector from Trade Deficits to a Competitive Resurgence", June 2014. Accessed at: <https://capi-icpa.ca/wp-content/uploads/2014/06/Taking-the-Sector-from-Trade-Deficits-to-a-Competitive-Resurgence-2014.pdf>.

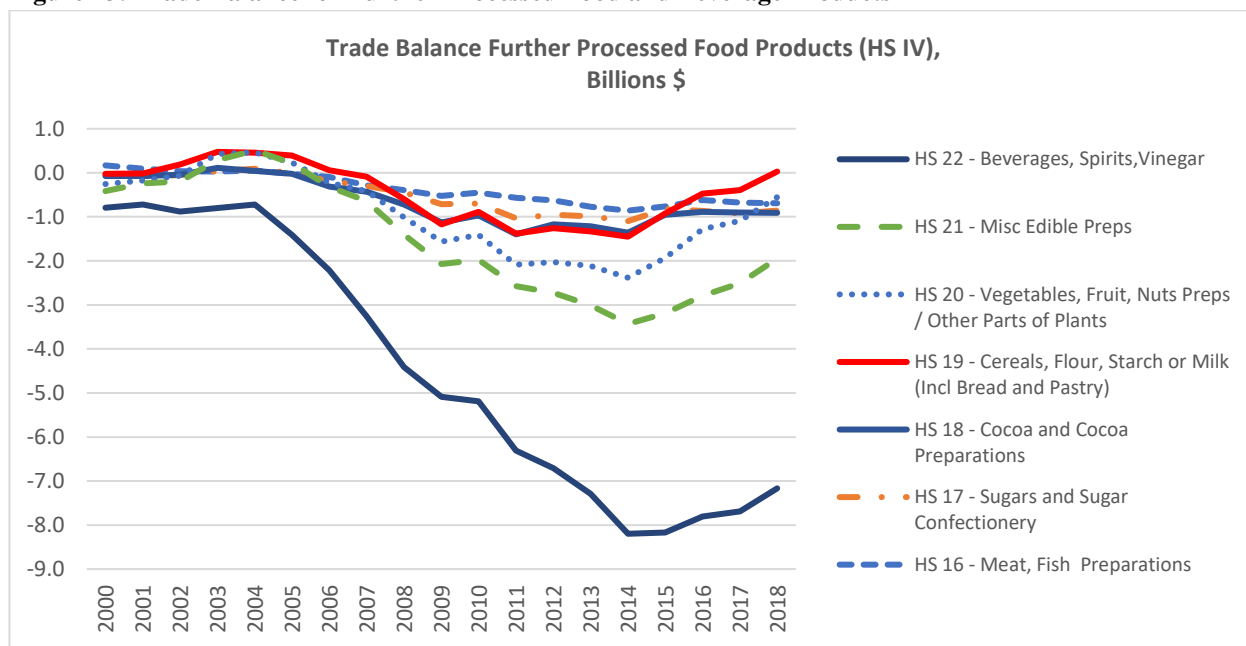
future competitiveness of the sector which prompted this analysis by CAPI. The trade deficit for further processed products continued to deteriorate until 2015 when it reached a low of -\$8.1 B. It has improved slightly since then, rising to -\$7.2 B in 2018.³¹

Figure 12: Exports, Imports and Trade Deficit for Further Processed Food and Beverage Products



Source: Industry, Science and Economic Development (ISED), Trade Database Online.

Figure 13: Trade Balance for Further Processed Food and Beverage Products



Source: Industry, Science and Economic Development (ISED), Trade Database Online.

³¹ See Annex B for a description of the HS codes for further processed FB products in the trade database.

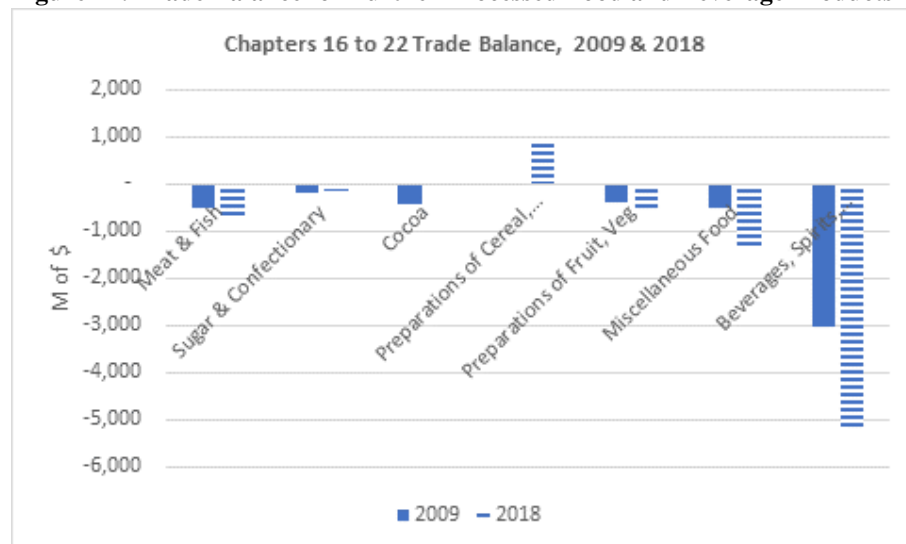
Changes over time in the trade balances for various FB processing products are shown above for the period between 2000 and 2018 (Figure 13). Figure 14 below shows the trade balance for the two periods 2009 and 2018 (Figure 14).³² This allows us to see whether there has been any improvement in the trade deficits reported since 2012-14.

While all sectors had trade deficits in 2009, by 2018, one category-cereal, flour, and starch (HS 19) had seen its trade balance turn positive. In meat, fish and seafood (HS 16), exports and imports of all subcomponents increased. However, it was only crustaceans (HS 1605) whose trade balance improved over time. Sugar (other than cane or beet sugar) and syrups (HS 1702) and chewing gum and confectionery (HS 1704) had trade surpluses in both years. For cocoa (HS 18), the trade balance for chocolate (HS 1806) improved from a deficit to a surplus as exports grew to reach \$1.9 B in 2018. In the cereals, flour and starch category (HS 19), bread (HS 1905) had a trade surplus in both years. Exports of bread grew from \$1.4 B to \$3.7 B between 2009 and 2018. For fruit and vegetable preparations (HS 20), only frozen potatoes (HS 2004) had a positive trade balance in both years, reaching \$1.3 B in 2018. For beverages, spirits and vinegar (HS 22), all categories at the four-digit level had trade deficits in both years. The largest deficits in 2018 were for wine (HS 2204) and water and non-alcoholic beverages with sugar (HS 2202) at -\$2.5 B and -\$0.8 B, respectively. So, while many further processed food products experienced trade deficits in 2018, there was some improvement compared to 2009. In particular, the trade balance for cereals, flour, and starch preparations turned significantly positive over the period, with the bread category showing continual improvement.

This is good news as trade balances for bread, frozen potatoes and chocolate have improved. There have been some mergers, acquisitions and expansion of plants producing at scale and exporting these products. On the other hand, the Canadian beverage industry is a concern, as its trade deficit continues to deteriorate, with only a slight turnaround after 2016. However, this may be partly linked to the growth in consumer demand for artisan beers from small local breweries, which only produce for local markets. Miscellaneous food is another area of concern, with a trade deficit that is growing larger each year. This category includes items such as coffee, tea, sauces, condiments, soups, ice cream and protein concentrates.

³² Further detail on each further processed FB processing category can be found in the full report by SJT Solutions. For access to the full report, please contact CAPI at info@capi-icpa.ca.

Figure 14: Trade Balance for Further Processed Food and Beverage Products



Source: Statistics Canada, Trade Database Online.

Competitiveness Indicators

The competitiveness of an industry is determined by many factors and can be measured by various indicators. According to the World Economic Forum (WEF), competitiveness is “the set of institutions, policies and factors that determine the level of productivity of a country.”³³ Hence, the competitiveness of Canada’s FB processing industry is impacted by the institutional and policy environment facing the country. The WEF ranks countries based on a series of indicators, including its enabling environment, human capital, innovation and markets. Based on indicators published in the 2019 Global Competitiveness Report, Canada ranked 14th out of 141 countries for competitiveness, with high marks for macroeconomic stability, a healthy population, a strong financial system and good infrastructure. However, lower ranking was received for product market efficiency, ICT adoption, innovation capability and labour market issues.³⁴ In terms of burden of government regulations, the WEF ranked Canada 38th out of 141 countries in 2019, which was a slight improvement over 2010, when it was ranked 41st out of 139 countries.

One indicator of competitiveness revolves around market share. “In general terms, competitiveness is understood to reflect the ability of firms ... to maintain and expand their market position in national and international markets.”³⁵ This is measured by the change over

³³ World Economic Forum, “What is competitiveness?”, September 2016. Accessed at: <https://www.weforum.org/agenda/2016/09/what-is-competitiveness/>.

³⁴ World Economic Forum, “The Global Competitiveness Report 2019”. Accessed at: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.

³⁵ Van Berkum S, “The Role of the Government in Enhancing Competitiveness of the Agri-Food Sector”, OECD Workshop 2004.

time in a country’s exports relative to the exports of competitors: in this case the top 20 exporters.³⁶ This measure is shown for various FB processing subsectors in Figure 15 below. Cocoa products (HS 18) improved their export competitiveness the most, increasing by 55% over the period. Meat and fish product manufacturing (HS 16) showed the next best improvement with cereal preparations, sugar and confectionery and fruit and vegetable preparations showing positive improvements as well. The greatest deterioration in competitiveness was recorded for beverages, spirits and vinegar (HS 22) and miscellaneous food (HS 21), with declines of 15% and 21%, respectively.³⁷

Figure 15: Change in Export Competitiveness of Further Processed Food and Beverage Products



Source: International Trade Centre: Trade Map.

Productivity Growth

Productivity growth is another indicator of competitiveness and key to the sector’s future competitiveness because it allows firms or industries to produce more efficiently. This reflects their ability to use existing capital and technology in an optimal way. If they can do this well relative to competitors, both in domestic and international markets, then they can grow, export, invest and flourish. Productivity measures a firm or industry’s ability to convert production inputs into production outputs. A more “productive” firm or industry has a higher ratio of output to inputs than a less productive firm or industry.³⁸

There are two productivity measures examined here. Labour productivity is the most well-known, measuring output from a given level of labour inputs (i.e. hours worked or number of employees).

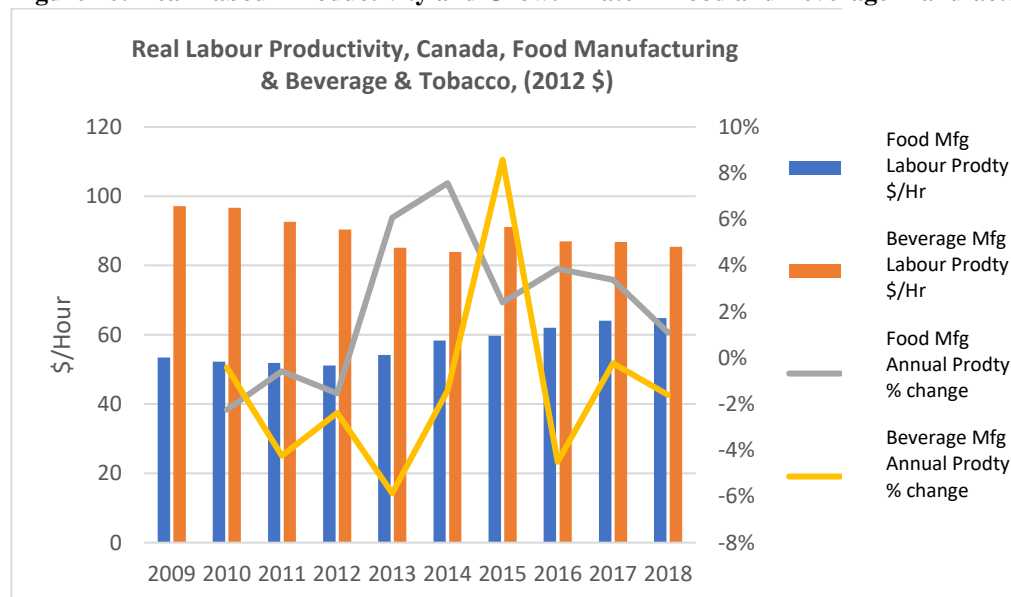
³⁶ This methodology is suggested in UNCTAD’s “Key Statistics and Trends in International Trade, 2017”.

³⁷ International Trade Centre: Trade Map.

³⁸ Gray, Richard, “Fostering Productivity and Competitiveness in Agriculture”, OECD, 2011.

Multi-factor productivity (MFP) measures output produced from a combination of inputs, which can include labour, capital, supplies and land. MFP is a strong indicator of technological progress. Productivity growth will take place as a result of innovation and investments in R&D, new technologies, new processes, management practices and new marketing methods.

Figure 16: Real Labour Productivity and Growth Rate in Food and Beverage Manufacturing



Source: Statistics Canada. Table 36-10-0480-01. Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts (<https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=3610048001>).

The FB processing sector has experienced productivity improvements since 2014 (Figure 16). Labour productivity is measured here as the ratio of value added to hours worked. In real terms, it rose from \$53.40/hour in 2009 to \$64.80/hour in 2018 in food manufacturing, while it declined in beverage and tobacco manufacturing, falling from \$97.10/hour in 2009 to \$85.40/hour in 2018. The average year over year percentage change for food manufacturing was 2% while it was -1% for beverage and tobacco manufacturing.

More detail for the sub-sectors and for all manufacturing sectors is shown in Table 2 below. All beverage and tobacco subsectors experienced a decrease in real labour productivity from 2009 to 2018. This is because growth in real value added did not keep pace with growth in hours worked. Labour productivity in food manufacturing is slightly lower than total manufacturing. Labour productivity in grain and oilseed milling was the highest in 2018 at \$172.60/hour. The high growth in productivity in this sub-sector was primarily due to strong growth in real value added (7%). Meat product manufacturing and seafood product preparation and packaging had the lowest real labour productivity in 2018 at \$50/hour and \$40.70/hour, respectively.

Table 2: Real Labour Productivity, Hours Worked and Value Added in Food, Beverage and Tobacco Manufacturing

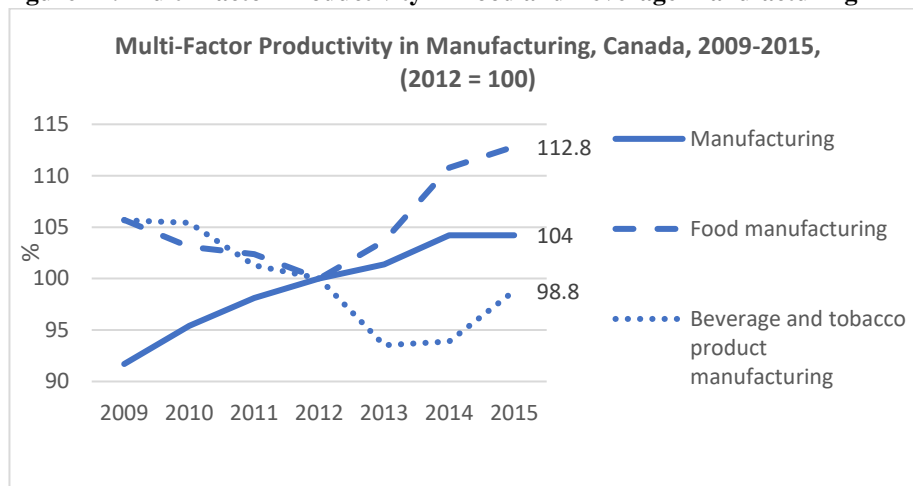
Real Labour Productivity, Canada, 2012 \$,									
	\$/Hour			Hours Worked, 000			Real Value Added, 000 of \$		
	2009	2018	CAGR	2009	2018	CAGR	2009	2018	CAGR
Food manufacturing	53.4	64.8	2%	423,348	424,780	0%	22,601,928	27,526,810	2%
Animal food manufacturing	59.8	71.6	2%	19,268	21,705	1%	1,151,616	1,553,845	3%
Sugar and confectionery product manufacturing	62.4	86.6	4%	21,963	17,677	-2%	1,369,629	1,531,369	1%
Fruit and vegetable preserving and specialty food manufacturing	57.6	76.3	3%	40,413	33,558	-2%	2,328,622	2,560,972	1%
Dairy product manufacturing	66.3	71.9	1%	45,719	43,586	-1%	3,033,269	3,132,892	0%
Meat product manufacturing	41.5	50	2%	131,533	116,555	-1%	5,459,528	5,822,053	1%
Seafood product preparation and packaging	33.6	40.7	2%	27,357	28,413	0%	920,373	1,157,630	3%
Grain and oilseed milling	125.5	172.6	4%	12,548	16,125	3%	1,574,597	2,782,883	7%
Bakeries and tortilla manufacturing	49.2	51.1	0%	80,096	86,651	1%	3,941,011	4,424,215	1%
Other food manufacturing	65.2	77.9	2%	44,448	60,512	3%	2,896,734	4,713,864	6%
Beverage and tobacco product manufacturing	97.1	85.4	1%	66,686	80,809	2%	6,477,146	6,897,160	1%
Soft drink and ice manufacturing	45.9	52.2	1%	29,730	32,023	1%	1,366,091	1,671,137	2%
Breweries	150.4	125.4	-2%	21,935	26,850	2%	3,298,190	3,367,496	0%
Wineries and distilleries	75.4	54.6	-4%	11,392	17,197	5%	858,655	938,395	1%
Tobacco manufacturing	262.1	197.9	-3%	3,629	4,739	3%	951,100	937,952	0%
Total Manufacturing (31-33)	55.1	65.8	2%	3,017,774	3,063,493	0%	166,348,167	201,530,147	2%

Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts (<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610048001>).

Multi-factor productivity (MFP), which measures output produced from a combination of inputs, is a strong indicator of a firm or industry’s competitiveness, reflecting its optimum use of inputs, efficiency and technological progress. Figure 17, below, shows how MFP in food manufacturing has risen significantly since 2012, more than total manufacturing or beverage and tobacco manufacturing.³⁹ This may reflect investments in R&D and new plants, equipment, new technologies and innovation that took place over the past decade. This bodes well for the sector’s future competitiveness. However, other factors at play may be undermining the sector’s success.

³⁹ Statistics Canada provides the following definition: “Multifactor productivity based on value-added measures the efficiency with which capital and labour inputs are used to generate value-added. It is the ratio of real gross domestic product (GDP) (real value-added) to combined labour and capital inputs.”

figure 17: Multi-Factor Productivity in Food and Beverage Manufacturing



Source: Statistics Canada. Table 36-10-0217-01 Multifactor productivity, gross output, value-added, capital, labour and intermediate inputs at a detailed industry level

(<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610021701>).

4.0 Competitiveness Factors

Based on analysis reported in the longer study by SJT Solutions, there are some key factors affecting the competitiveness and performance of the Canadian FB manufacturing industry.⁴⁰ Some of these factors have a positive influence, while others pose competitive challenges.

Some of the factors having a positive influence include:

- Canada has a stable interest rate environment which makes investment attractive;
- Canada has a well-educated and relatively prosperous population with a high standard of living;
- Canada has an internationally recognized food safety and inspection system that promotes international market access;
- Canada has negotiated several bilateral trade agreements that have provisions that may lead to increased value-added exports (e.g. CPTPP, CETA);
- Since 2013, the value of the Canadian dollar relative to the US has declined. While a falling Canadian dollar relative to the US makes Canadian exports more attractive, it also increases the cost of imported inputs for the FB sector;
- Canada’s Marginal Effective Tax Rate (METR) fell from 44.1% in 2000 to 13.7% in 2019. This is the lowest in the G7 countries. In 2019, the US’s METR was 18.4%. Canada has a lower METR than the US because of Canada’s use of value-added taxes (HST and GST);⁴¹

⁴⁰ For access to the full report, please contact CAPI at info@capi-icpa.ca.

- Spending by the private sector in the areas of science and engineering has been stable in nominal terms, averaging \$13.0 B in 2018. The share of Canadian GDP used to directly fund business R&D has trended upwards since 2007; and
- The federal and provincial governments understand the importance of innovation for future competitiveness and growth and offer a broad spectrum of programs and support to spur innovation in Canada. AAFC offers three investment programs that FB processors have utilized: AgriInnovate, AgriScience, as part of the Canadian Agricultural Policy framework (CAP), and the Dairy Processing Investment Fund. Under the AgriScience Program, the Protein Industries Supercluster will receive \$153 M in federal funds, matched by private sector funding.

Some of the factors providing challenges to the FB manufacturing industry which may be hindering its competitiveness and performance include:

- Significant cost pressures limiting the ability of processors to seize opportunities to build scale or scope. Since 2009, FB processors have faced an extreme cost-price squeeze with output prices (as measured by the industrial product (selling) price index) increasing more slowly than the price of inputs (as measured by the raw materials price index). This has led to lower profit margins and more difficulty expanding production and competing. Since 2013, the beverage manufacturing sector has also faced a large cost-price squeeze;⁴²
- Severe labour shortages in some regions faced by some food manufacturing subsectors. The number of temporary foreign workers (TFW) increased to 2,490 in 2018 from 1,120 in 2015, but more are still needed.⁴³ Quebec and Ontario employed the most TFWs in the FB processing category in 2018. There are also severe labour shortages in trucking and transportation. Fortunately, the federal government has introduced an Agri-Food Immigration Pilot project that will enable eligible workers in meat processing, mushroom production, and greenhouse crop production to apply for permanent residency in Canada.⁴⁴ This may provide incentives for finding workers and help address some of these shortages;
- Infrastructure issues, such as deteriorating roadways, lack of broadband and up to date telecommunications infrastructure, insufficient port and rail capacity are impacting Canada's ability to get products to market efficiently and in a timely manner. Many regions lack broadband infrastructure which increases the cost of doing business and prevents

⁴¹ Finance Canada, "Marginal Effective Tax Rates: Background", July 2019. Accessed at:

<https://www.canada.ca/en/department-finance/news/2019/07/backgrounder--marginal-effective-tax-rates.html>.

⁴² Statistics Canada. Accessed at: <https://www150.statcan.gc.ca/n1/daily-quotidien/190628/dq190628b-eng.htm> and <https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=1810003401>.

⁴³ Labourers in food, beverage and associated products processing; labourers in fish and seafood processing; and fish and seafood plant workers.

⁴⁴ The Agri-Food Immigration Pilot is described here: <https://www.canada.ca/en/immigration-refugees-citizenship/news/2019/07/agri-food-immigration-pilot.html>.

timely information dissemination and connectivity. Also, insufficient slaughterhouse capacity in some regions (e.g. Ontario) prevents the efficient and effective value-added needed to meet market demands;

- Canada’s tax regime has become very complex. This has led to recent calls by organizations such as Food and Consumer Products Canada (FCPC) and the Business Council of Canada (BCC) for a major review of the tax system to simplify and modernize it;⁴⁵
- While Canada still has some of the lowest business taxes (i.e. METRs) relative to international competitors, its relative competitive advantage has been reduced as other countries have lowered their business tax rates recently.⁴⁶ As an example, U.S. legislated changes in 2017 introduced lower corporate tax rates, accelerated capital cost write-offs and other measures.⁴⁷ The introduction of a federally-imposed carbon tax in some provinces may also lead to higher taxes for some businesses; and
- Regulatory burdens are hindering the performance of Canada’s FB processing sector. These burdens include lack of predictability, complexity, lack of regulatory harmonization with the U.S., interprovincial barriers to trade, and high regulatory compliance costs. Recent reports by the Standing Senate Committee on Agriculture and Forestry (2019), the Canadian Chamber of Commerce (2019), Food and Consumer Products Canada (2018) as well as the AFEST (2018) all have pointed to the challenges raised by regulatory burden for the future growth and success of the sector.⁴⁸ Nevertheless, the WEF’s Global Competitiveness Report indicated some improvement in Canada’s ranking relative to other countries in government regulatory burden between 2010 and 2019, with Canada’s rank rising from 41st out of 139 countries to 38th out of 141 countries over this period.

5.0 Recent Trade Agreements and Competitiveness

Given the importance of trade for Canadian FB processors, recent negotiations of three important trade agreements with major countries provide some hope for improvements in Canada’s trade position. By 2018, Canada had negotiated 14 trade agreements, excluding the WTO multilateral

⁴⁵ Food and Consumer Products Canada (FCPC), “Industry Sustainability and Competitiveness Study”, November 2018. Accessed at:

https://www.fcpc.ca/Portals/0/Userfiles/PAResources/Public%202019/FCPC%20Industry%20Sustainability%20Study_v1.pdf?ver=2019-04-23-121158-917×tamp=1556036554242; Canadian Chamber of Commerce, “Cultivating Competitiveness”, April 2019. Accessed at: <http://www.chamber.ca/media/blog/190417-cultivating-competitiveness/190418CultivatingCompetitivenessTurningAgri-foodRegulatoryReformPromisesIntoAction.pdf>.

⁴⁶ C.D. Howe, “Tooling Up: Canada Needs More Robust Capital Investment”, September 2018. Accessed at: <https://www.cdhowe.org/public-policy-research/tooling-canada-needs-more-robust-capital-investment>.

⁴⁷ Finance Canada, “Marginal Effective Tax Rates: Background”, July 2019. Accessed at: <https://www.canada.ca/en/department-finance/news/2019/07/background--marginal-effective-tax-rates.html>.

⁴⁸ FCPC. “Industry Sustainability and Competitiveness Study”, November 2018; Canadian Chamber of Commerce, “Cultivating Competitiveness”, April 2019.

agreement. The three most significant agreements include the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the EU-Canada Comprehensive Economic and Trade Agreement (CETA) and the Canada U.S. Mexico Agreement (CUSMA).

The CPTPP is a trade agreement between Canada and the following ten nations: Australia, Brunei, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam. It was concluded on January 23, 2018 and came into force on December 30, 2018 between Australia, Canada, Japan, Mexico, New Zealand and Singapore, and between Canada and Vietnam on January 14, 2019.⁴⁹ Japan is a major destination of Canadian FB processing exports, at \$2.5 B in 2018.⁵⁰

The second agreement, CETA, came into effect provisionally on September 21, 2017. It has been ratified by 13 member states but must be ratified by all members to come into effect definitively.⁵¹ The EU also is a major export destination for Canadian FB products, at \$1.2 B in 2018.

The third agreement, the Canada United States Mexico Agreement (CUSMA) was signed in November 2018 and was ratified by the U.S in December 2019. Until it is ratified by all members, the 1994 NAFTA remains in place. The U.S. is of course a major export destination for Canada's food products, at \$25 B in 2018.

The estimated impact of these various trade agreements on competitiveness is shown below in Table 3.⁵² Under the CPTPP, Canada is expected to lose some advantage as CPTPP diluted benefits of existing free trade agreements with Mexico, Chile, and Peru.⁵³ In addition, the recent trade deal between the U.S. and Japan, which allows the U.S. to export beef and pork to Japan at lower tariff rates, is also diluting some of the benefits that Canada had expected from the CPTPP. The competitiveness of the dairy sector is negatively affected by the CPTPP due to the increases in market access for foreign dairy products. The Canadian government is promising compensation of \$1.75 B over 8 years to producers to help in adjustments that are required by the industry in response to these trade agreements.

⁴⁹ Global Affairs Canada, "Economic impact of Canada's participation in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership", February 2018. Accessed at: <https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cptpp-ptpqp/impact-repercussions.aspx?lang=eng>.

⁵⁰ For more data and information on these trade agreements see the full report by SJT Solutions. For access to the full report, please contact CAPI at info@capi-icpa.ca.

⁵¹ Business Development Bank of Canada (BDC), "CETA: What does the Canada-EU trade deal mean for your business?". Accessed at: <https://www.bdc.ca/en/articles-tools/marketing-sales-export/exportation/pages/ceta-what-does-canada-eu-trade-deal-mean-for-your-business.aspx>.

⁵² The estimated impacts on trade are from at least three different studies, none of which share the same assumptions, methodology, etc. The impacts on market share of the trade agreements should be viewed as primarily directional.

⁵³ The first mover advantage is diluted by the US and Japan reaching an agreement regarding agricultural exports.

Under CETA, Canada also gains first mover advantage relative to the US, which does not have a bilateral agreement with Europe. Overall, the competitiveness of wheat, food products, and sugar, as measured by export shares, are expected to increase. However, Canadian imports of some food products, including cheese from CETA countries, are expected to increase as a result, leading to competitiveness pressures in these sectors. There are still a significant number of non-tariff barriers impacting trade with Europe.⁵⁴

Under the CUSMA, several studies have estimated the impacts of the agreement. Ciuriak et al. (2019) reported a slightly negative GDP effect, while Burfisher et al. (2019) reported a slightly positive one.⁵⁵ Exports to the US are expected to fall for several agricultural products but increase for food products. Imports will increase for dairy and poultry products. Total shipments of food products could fall as well as beverage and tobacco products, especially if declining GDP leads to lower domestic demand as a result of the macroeconomic consequences of the agreement. However, the magnitudes of the changes are not expected to be large for most sectors, and with economic growth, these sectors will continue to grow, albeit at slower rates (Ciuriak, 2019). Benefits arise for Canada from the increased certainty associated with CUSMA ratification by all parties.

⁵⁴ Devadoss S. and J. Luckstead. 2018. “Implications of the CETA for Processed Food Markets.” *Canadian Journal of Agricultural Economics*. 66. Pp 415-440.

⁵⁵ Ciuriak, D et al. 2019. “Quantifying CUSMA: The Economic Consequences of the New North American Trade Regime.” Toronto: C.D. Howe Institute. July. and Burfisher, M. et al. 2019. “NAFTA to CUSMA: What is Gained?” IMF Working Paper WP/19/73.

Table 3: Impact of Recent Trade Agreements on the Canadian Food and Beverage Processing Sector

Impact of CPTPP, CETA, and CUSMA on Export Market Share			
Element	Trade Agreement		
	CPTPP	CETA	CUSMA
Market Size	GDP: \$US 11 T Population: 523.4 M	GDP: US\$ 18.8 T Population: 549.7 M	GDP: US\$ 23.4 T Population: 490.3 M
Prior Free Trade Agreements with Canada	Mexico, Chile, and Peru	None	NAFTA (in place until ratification by all parties)
Market Access	Positive for Canadian processed food, pork, beef, wheat, barley, canola; Negative for Canadian dairy (3.25% of market accessible by foreign producers)	Positive for Canadian processed food (except for refined sugar and sweet corn); 94% of tariff lines now zero; Negative for Canadian dairy (increase in EU cheese imports 17,700 Mt)	Positive for Canadian refined sugar and sugar containing products, some dairy products and chicken and turkey Negative for Canadian dairy, poultry and eggs (3.59% market share gain by U.S.)
Non-Tariff Barriers	No Change	No Change	Some US grain eligible for official Canadian grade
Impact	Canadian GDP increases; Increased Canadian exports: beef, pork, sugar Decreased Canadian exports or increased Canadian imports: dairy (largest loss) other food, beverage and tobacco Canada gains first mover advantage relative to the US Canada loses some advantage as CPTPP dilutes benefits of agreements with Mexico, Chile, and Peru	Increased Canadian exports: wheat, food products, sugar, some dairy and poultry Increased Canadian imports: food products, dairy; Canada gains first mover advantage relative to the US	Negligible impacts on GDP: any negative impacts mostly due to trade restrictions through rules of origin and primarily automobiles; Agriculture little affected other than supply management (dairy, poultry) access increased. However, U.S. barriers on Canadian dairy, sugar and sugar products, peanuts and peanut products reduced. Continued cooperation on SPS issues for equivalence and harmonization of regs. ⁵⁶ Some improvement in trade facilitation Increase in some Canadian agri-food exports Increase in some Canadian agri-food imports. Reduction in food product imports and shipments if GDP declines

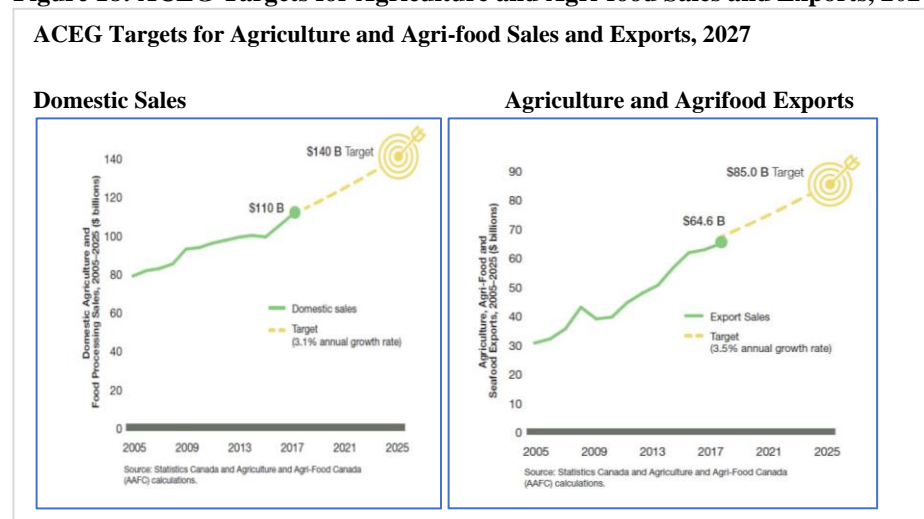
6.0 ACEG Export Targets

It would appear that these recently signed trade agreements will bode well for the growth targets set by the Advisory Council on Economic Growth (ACEG) and the Agri-Food Economic Strategy Tables (AFEST). Specifically, the targets aimed for growth in Canada’s agricultural exports by \$9

⁵⁶ Kerr, W. “Agriculture in the U.S., Mexico and Canada Agreement: Agreeing to keep things pretty much the same”, Canadian Journal of Agricultural Economics, 2019, 1-8.

billion and \$11B for FB processing exports, by 2027.⁵⁷ In this way, Canada would “double our share of world exports, to 5.6 percent, from 2.8 percent.”⁵⁸ The AFEST also set a domestic sales growth target of \$140 B by 2027 (Figure 18).

Figure 18: ACEG Targets for Agriculture and Agri-food Sales and Exports, 2027



Source: Statistics Canada and AAFC.

How fast do Canadian exports need to grow to meet the market share target of 5.2% in 2027?

Assuming that there is no growth in world exports from 2015 to 2027, Canadian exports would have to grow at a compound annual rate (CAGR) of 5.9% annually. However, if world exports grew at 2.9%, as they did between 2008 and 2018, then Canadian exports would have to grow by 9.1% to reach an export share of 5.2% by 2027. World exports of agri-food products grew by an average of 7.2% per year from 2001 to 2018. If world exports grew at this rate from 2015 to 2027, Canadian exports would have to grow at an average annual rate of 13.7% to reach the market share target.

Given the economic headwinds in the global economy and the increasingly disrupted trade environment, there are significant downside risks related to trade uncertainty. **Based on these factors it does not appear likely that Canada will hit its export market share target of 5.2% in 2027 under a business as usual scenario.**

Other analysis has reached similar conclusions. In 2018, the federal government launched a strategy to diversify and grow Canadian exports of all goods and services by 50% by 2025. If successful, these exports would reach \$284 B by 2025. This would require an average annual

⁵⁷ The 2015 market shares are from a report by Farm Credit Canada: <https://www.fcc-fac.ca/fcc/knowledge/ag-economist/capt-report-2016.pdf>.

⁵⁸ Advisory Council on Economic Growth, “Unleashing the Growth Potential of Key Sectors”, February 2017.

growth rate for exports of 5.2%. Global Affairs Canada concluded that reaching this target may not be possible under most of the scenarios examined.⁵⁹

7.0 Conclusions and Future Implications

This study was commissioned to determine if the Canadian FB processing sector has made progress in expanding exports, reducing its trade deficit, and becoming more competitive since 2012, when CAPI undertook its program of work on the competitiveness of the sector.⁶⁰ It also was tasked with determining how the sector will benefit from recent trade agreements that Canada has signed with Pacific countries (CPTPP), the European Union (CETA), and the U.S. and Mexico (CUSMA). Finally, it was tasked with determining the feasibility of achieving the export growth targets set out by the AFEST in 2018. The study concludes with some implications for policy and industry strategies to support the sector's future growth and competitiveness.

The study began with a description of how the structure and performance of the sector has evolved over time, including its distribution by size, province and subsector. It showed that the number of food manufacturing establishments declined by 4% over the 2009 to 2018 period but increased sharply for beverage manufacturing (50%). The FB processing industry as a whole continues to be the largest manufacturing sector in Canada, in terms of both shipments, GDP and employment, and has managed to grow more than many other manufacturing industries over this period. There was a decline in the number of establishments in the Maritime provinces, but an increase in Ontario, Saskatchewan, Alberta and Manitoba. Some major players have disappeared from Eastern Canada, such as Kellogg Canada and Heinz while there has been growth in new value-added industries on the Prairies, such as James Cameron's Verdient Foods. There have also been substantial mergers and acquisitions and consolidation of smaller players into larger multinational ones (e.g. Kraft Heinz).

For the FB processing industry, like other Canadian manufacturing industries, capital spending on machinery and equipment has been sluggish since 2009. Major factors that may have curtailed this investment include trade and business uncertainty, tax and regulatory burdens and high electricity and transportation costs and labour shortages that have dampened profitability and the investment environment. There has, however, been an uptick in spending on new plants and machinery and

⁵⁹ Global Affairs Canada, "Canada's State of Trade 2019", 20th Edition, 2019. Accessed at: https://www.international.gc.ca/gac-amc/publications/economist-economiste/state_of_trade-commerce_international-2019.aspx?lang=eng.

⁶⁰ Canadian Agri-Food Policy Institute, "Taking the Sector from Trade Deficits to a Competitive Resurgence", June 2014. Accessed at: <https://capi-icpa.ca/wp-content/uploads/2014/06/Taking-the-Sector-from-Trade-Deficits-to-a-Competitive-Resurgence-2014.pdf>; Canadian Agri-Food Policy Institute, "Understanding the Processed Food Trade Balance", October 2013. Accessed at: <https://capi-icpa.ca/wp-content/uploads/2013/10/Understanding-the-Processed-Food-Trade-Balance-2013.pdf>.

equipment, with investments in new, modern facilities in the Western Provinces, Roquette and Verdient Foods (pea processing) and Gay Lea Foods (dairy processing). Canadian FB processors have also increased their investments in the U.S. and abroad, such as Maple Leaf Foods' new plant-based meat processing plant being built in Indiana and Saputo's acquisition of British Dairy Crest in 2019.

Food and Consumer Products of Canada is concerned about the long-term sustainability of the FB manufacturing sector. It cites many of the issues identified in this study such as the cost price squeeze and regulatory burdens as subjecting the sector to considerable stress.⁶¹

Statistics Canada found that investment in advanced technology by Canadian food and beverage manufacturers lagged that of total manufacturing. The top challenges included resistance by employees to change, and lack of employee training. Even more concerning was that FB manufacturers didn't think advanced technology was necessary or applicable. A change in mindset along with investments in new technologies and skilled employees who will be able to make use of them will be necessary to enhance the competitiveness of Canadian FB manufacturers.

In terms of investments in R&D, the study shows that business investments in R&D have increased in Canada, but primarily by the larger establishments. The vast majority of FB manufacturers are small and tend to invest less in advanced technologies, probably because of their lack of scale and resources. Productivity increases have nevertheless been registered for FB processing that is higher than in other manufacturing industries. This provides some glimmer of optimism for the future competitiveness of the sector.

In a recent report on global competitiveness, the WEF introduced new metrics to assess and understand competitiveness in the Fourth Industrial Revolution (4IR) where human capital, innovation, resilience, and agility will become increasingly important.⁶² The Fourth Industrial Revolution (Industry 4.0) can be described as a range of new technologies that are fusing the physical, digital and biological worlds, and impacting all disciplines, economies and industries. Central to this revolution are emerging technological breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3D printing and nanotechnology."⁶³

Experts suggest that FB processing could significantly benefit from Industry 4.0. However, FB manufacturers may have difficulty in seizing the opportunities. A 2018 study by the OECD

⁶¹ FCPC, "Industry Sustainability & Competitiveness Study", 2018.

⁶² World Economic Forum, "The Global Competitiveness Report 2018", October 2018. Accessed at: <https://www.weforum.org/reports/the-global-competitiveness-report-2018>.

⁶³ "The first industrial revolution (1714) used water and steam as the driving forces. The second (1870) was that of electricity and the division of labor. The third industrial revolution (1969) has been automation, electronics, and IT". Source: <https://www.igi-global.com/dictionary/fourth-industrial-revolution/59521>.

suggests that the digital intensity of FB processors in many industrialized countries is low. Digital intensity is measured by “firms’ investments in “digital” assets, as well as by changes in the way companies approach markets and interact with clients and suppliers, by the (type of) human capital and skills needed, and the way production is organised”.⁶⁴ If Canada is to improve its competitiveness ranking from 14th in the world, then it will have to make progress in this emerging area, as this is now a major component of the WEF’s set of 12 competitiveness factors.⁶⁵

This study also examined the trade deficit and competitiveness of Canadian FB processing and further processed products. The analysis indicates that several Canadian FB processing exports have improved their competitiveness in world markets since 2009, as measured by export market shares. The largest improvement was experienced by cocoa (up 55.2%) and meat and fish preparations (21.8%), followed by cereal, flour and bread (8.5%) and sugar and confectionery (6.4%). The greatest deterioration in competitiveness was recorded for beverages, spirits and vinegar (HS 22) and miscellaneous food (HS 21), with declines of 15% and 21%, respectively over the 2009 to 2018 period. This study has also examined if exports of processed FB products provide opportunities for growth. The analysis indicated that not all Canadian FB processing exports are competitive in world markets.

In terms of the trade balance for further processed FB products, there has been an improvement in the gap between exports and imports since about 2015 with the trade balance improving for most products studied in CAPI’s program of work in 2012-2014, except for beverages and spirits. The trade deficit for further processed FB products rose from -\$8.1 B in 2015 to -\$7 B in 2018. At the same time, the trade balance for all FB processing products rose to \$2.7 B in 2018 from a deficit of -1.1 B in 2015.

While Canada’s recently signed trade agreements will enable growth for some sectors and products, these agreements are not a panacea for all subsectors. In particular, the dairy processing sector faces increased competition as foreign signatories have been given increased market access in Canada. Dairy processors will have to continue to improve their competitiveness in the future. Also, the recent trade agreement between the U.S. and Japan (outside of CPTPP), which provides lower tariffs on beef and pork products into Japan from the U.S., prevents Canada from benefiting to the extent it had expected from its participation in the CPTPP, as a result of reduced tariffs on these products into Japan. Finally, the uncertainty that remains with the trading environment and departure from rules-based trade, will certainly continue to hinder Canada achieving its export growth targets as set out by Barton and the Agri-Food Economic Strategy Tables (AFEST).

⁶⁴ OECD, “Measuring the Digital Transformation: A Roadmap for the Future”, 2019. Accessed at: <https://www.oecd.org/going-digital/mdt-roadmap-digital-intensity-of-sectors.pdf>.

⁶⁵ World Economic Forum, “The Global Competitiveness Report 2018”, October 2018. Accessed at: <https://www.weforum.org/reports/the-global-competitiveness-report-2018>.

Where there is some optimism, it is in the response of Canadian FB processors to consumers, both at home and abroad, who are demanding healthier, safer and more sustainable and high-quality food products. Many Canadian FB processors have demonstrated a commitment to reducing their environmental footprint (e.g. Maple Leaf Foods and their carbon neutral pledge), finding suppliers who can certify and guarantee sustainable inputs (e.g. sustainable beef for McDonald's) and investing in new state of the art processing plants that can produce new products that consumers are increasingly demanding (e.g. pea protein for alternative meat products). There has also been a dramatic increase in the number of small, local FB processors supplying high quality products for local markets (e.g. craft breweries, Purdy's chocolates). Clearly, Canadian FB processors are responding to the changing environment in which they are operating and focusing on adding value while "optimizing" growth and preserving Canada's resources for the future.

However, the sector must continue to adapt and remain resilient in the face of constant changes to the trade and policy environment. A more conducive business and policy environment requires that regulations are simplified and made more efficient to speed up regulatory approvals and encourage innovation. Harmonization and equivalency of regulations could also promote market access abroad. The tax regime could be simplified and modernized to reduce the tax burden and ensure tax rates allow our companies to compete against lower business taxes that are being introduced in the U.S. and other OECD countries. Temporary Foreign Worker legislation could be made more efficient and effective to prevent labour shortages for agricultural producers, trucking and meat and other food processors. Investments in transportation, roadways and telecommunications infrastructure would ensure our products can be efficiently transported to markets around the world. Finally, Canadian trade representatives need to work hard to ensure trade is governed by fair, science-based rules that do not prevent our companies from accessing foreign markets.

In addition to these changes, the Canadian FB processing industry would benefit from a change in mindset that would see it develop new strategies and approaches that make it even more nimble and responsive to the changing trade and business environment and changing consumer demands. It needs to take more risks, embrace the 4th Industrial Revolution, invest in more new technologies and highly skilled labour, while adding more value here at home. If this is done, then there is a chance that the sector could become leading edge and competitive. If the environment is right, then the future can be promising for the Canadian FB processing industry and it could face the challenges and benefit from the opportunities emerging in global and domestic markets.

Annexes

Annex A: NAICS Classifications

Food Processing and Beverage Manufacturing Sector Structure, NAICS Classifications
Food manufacturing, 311 This subsector comprises establishments primarily engaged in: producing food for human or animal consumption. Excludes Manufacturing beverage sort tobacco (see 312 Beverage and tobacco product manufacturing)
Sub-Sector & NAICS Code
3111 – Animal food manufacturing This industry group comprises establishments primarily engaged in: manufacturing food and feed for animals, including pets
3112 – Grain and oilseed milling This industry group comprises establishments primarily engaged in: milling grains and oilseeds; refining and blending fats and oils; and making breakfast cereal products. Excludes milling to produce animal feed.
3113 Sugar and confectionery product manufacturing This industry group comprises establishments primarily engaged in: manufacturing sugar and confectionery products
3114 Fruit and vegetable preserving and specialty food manufacturing This industry group comprises establishments primarily engaged in: manufacturing frozen fruits and vegetables; frozen entrees and side dishes of several ingredients, except seafood; and fruits and vegetables preserved by pickling, canning, dehydrating and similar processes.
3115 Dairy product manufacturing This industry group comprises establishments primarily engaged in: manufacturing dairy products. Establishments primarily engaged in manufacturing substitute products are included.
3116 Meat product manufacturing This industry group comprises establishments primarily engaged in: manufacturing meat products.
3117 Seafood product preparation and packaging This industry group comprises establishments primarily engaged in: canning seafood, including soup; smoking, salting and drying seafood; preparing fresh fish by removing heads, fins, scales, bones and entrails; shucking and packing fresh shellfish; processing marine fats and oils; and freezing seafood. Establishments known as “floating factory ships”, that are engaged in shipboard processing of seafood, are included.
3118 Bakeries and tortilla manufacturing This industry group comprises establishments primarily engaged in: manufacturing baked goods. Establishments primarily engaged in manufacturing bakery products, for retail sale, but not for immediate consumption, are included.
3119 Other food manufacturing This industry group comprises establishments, not classified to any other industry group, primarily engaged in manufacturing food.
3112 Beverage manufacturing This industry group comprises establishments primarily engaged in: manufacturing beverages. Excluded: Establishments primarily engaged in: canning fruit and vegetable juices; freezing juices and drinks (see 3114 Fruit and vegetable preserving and specialty food manufacturing) manufacturing milk-based drinks (see 311511 Fluid milk manufacturing) manufacturing soft drink bases or fruit syrups for flavouring; coffee and tea, except ready-to-drink; powdered drink mixes; and non-alcoholic cider (see 3119 Other food manufacturing)
Soft Drink and Ice Manufacturing – 31211 This industry comprises establishments primarily engaged in manufacturing soft drinks, ice or bottled water, including that which is naturally carbonated. Water-bottling establishments in this industry purify the water before bottling it.
Breweries – 31212 This industry comprises establishments primarily engaged in brewing beer, ale, malt liquors and non-alcoholic beer.
Wineries – 31213 This industry comprises establishments primarily engaged in manufacturing wine or brandy, from grapes or other fruit. Establishments primarily engaged in growing grapes and manufacturing wine; manufacturing wine from purchased grapes and other fruit; blending wines; or distilling brandy are included.
Distilleries – 31214 This industry comprises establishments primarily engaged in distilling liquor, except brandy; blending liquor; or blending and mixing liquor and other ingredients.

Annex B: Further Processed FB Manufacturing HS Commodity Codes

Trade Analysis, HS Codes
Chapter 16 Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates
HS 1601 – SAUSAGES AND SIMILAR PRODUCTS OF MEAT, MEAT OFFAL OR BLOOD; FOOD PREPARATIONS OF THESE PRODUCTS
HS 1602 – PREPARED/PRESERVED MEAT, MEAT OFFAL OR BLOOD (OTHER THAN SAUSAGES)
HS 1603 – EXTRACTS AND JUICES OF MEAT, FISH OR CRUSTACEANS, MOLLUSCS OR OTHER AQUATIC INVERTEBRATES
HS 1604 – FISH, CAVIAR AND CAVIAR SUBSTITUTES – PREPARED OR PRESERVED
HS 1605 – CRUSTACEANS, MOLLUSCS AND OTHER AQUATIC INVERTEBRATES – PREPARED OR PRESERVED
Chapter 17 Sugars and sugar confectionery
HS 1701 – CANE OR BEET SUGAR
HS 1702 – SUGARS (OTHER THAN CANE OR BEET SUGAR); SUGAR SYRUPS, ARTIFICIAL HONEY; CARAMEL
HS 1703 – MOLASSES
HS 1704 – CHEWING GUM AND OTHER SUGAR CONFECTIONERY
Chapter 18 Cocoa and cocoa preparations
HS 1801 – COCOA BEANS, WHOLE OR BROKEN, RAW OR ROASTED
HS 1802 – COCOA SHELLS, HUSKS, SKINS AND OTHER COCOA WASTE
HS 1803 – COCOA PASTE
HS 1804 – COCOA BUTTER, FAT AND OIL
HS 1805 – COCOA POWDER, NOT CONTAINING ADDED SUGAR OR OTHER SWEETS
HS 1806 – CHOCOLATE AND OTHER FOOD PREPARATIONS CONTAINING COCOA
Chapter 19 Preparations of cereals, flour, starch or milk; pastrycooks' products
HS 1901 – FOOD PREPARATIONS OF CEREALS, FLOUR, STARCH, MALT OR MILK
HS 1902 – PASTA
HS 1903 – TAPIOCA AND SUBSTITUTES PREPARED FROM STARCH IN FLAKE, GRAIN, PEARL, SIFTING OR SIMILAR FORMS
HS 1904 – PREPARED FOODS, OBTAINED BY THE SWELLING OR ROASTING OF CEREALS OR CEREAL PRODUCTS
HS 1905 – BREAD, PASTRY, CAKES, BISCUITS AND OTHER BAKERS' WARES
Chapter 20 Preparation of vegetables, fruit, nuts or other parts of plants
HS 2001 – VEGETABLES, FRUITS, NUTS OR EDIBLE PLANT PARTS – PREPARED/PRESERVED WITH VINEGAR/ACETIC ACID
HS 2002 – TOMATOES – PREPARED/PRESERVED WITHOUT VINEGAR/ACETIC ACID
HS 2003 – MUSHROOMS AND TRUFFLES – PREPARED/PRESERVED WITHOUT VINEGAR/ACETIC ACID
HS 2004 – POTATOES AND OTHER VEGETABLES – FROZEN WITHOUT VINEGAR/ACETIC ACID
HS 2005 – POTATOES AND OTHER VEGETABLES – PRESERVED WITHOUT FREEZING OR VINEGAR/ACETIC ACID
HS 2006 – VEGETABLES, FRUITS, NUTS, FRUIT-PEEL AND OTHER PARTS OF PLANTS – PRESERVED BY SUGAR
HS 2007 – COOKED PREPARATIONS OF HOMOGENIZED OR CITRUS FRUITS, JAMS, FRUIT JELLIES, FRUIT OR NUT PUREE, AND PA
HS 2008 – PREPARATIONS OF FRUITS, NUTS AND EDIBLE PLANTS PARTS – OTHER THAN COOKED
HS 2009 – FRUIT AND VEGETABLE JUICES – UNFERMENTED AND UNSPIRITED
Chapter 21 Miscellaneous edible preparations
HS 2101 – COFFEE, TEA OR MATE EXTRACTS, ESSENCES, CONCENTRATES AND PREPARATIONS THEREOF
HS 2102 – YEASTS AND PREPARED BAKING POWDERS
HS 2103 – SAUCES, MIXED CONDIMENTS AND SEASONINGS, MUSTARD FLOUR AND MEAL, AND PREPARED MUSTARD
HS 2104 – SOUPS AND BROTHS AND PREPARATIONS THEREOF; HOMOGENIZED COMPOSITE FOOD PREPARATIONS
HS 2105 – ICE CREAM AND OTHER EDIBLE ICE, WHETHER OR NOT CONTAINING COCOA
HS 2106 – PROTEIN CONCENTRATES, TEXTURED PROTEIN SUBSTANCES AND OTHER FOOD PREPARATIONS NES
Chapter 22 Beverages, spirits and vinegar
HS 2201 - WATER - WITHOUT SUGAR, SWEETENING OR FLAVOURING
HS 2202 - WATER AND NON-ALCOHOLIC BEVERAGES (EXCL. JUICES) - WITH SUGAR, SWEETENING OR FLAVOURING
HS 2203 - BEER
HS 2204 - GRAPE WINES (NON AROMATIC) AND GRAPE MUST
HS 2205 - VERMOUTH AND OTHER AROMATIC GRAPE WINES
HS 2206 - FERMENTED BEVERAGES NES (INCLUDING CIDER, PERRY, MEAD)
HS 2207 - ETHYL ALCOHOL AND OTHER DENATURED SPIRITS
HS 2208 - SPIRITS, LIQUEURS AND OTHER SPIRITUOUS BEVERAGES OR ALCOHOLIC PREPARATIONS
HS 2209 - VINEGAR AND SUBSTITUTES FOR VINEGAR OBTAINED FROM ACETIC ACID