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Analysis of the beef supply chain

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Correction Notice

On November 10, 2021, a correction was made to the values in Table 8 and Table 9 associated with number of cattle and supply and disposition of cattle respectively.

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Executive summary

The Centre for Special Business Projects (CSBP) at Statistics Canada produced this report for Agriculture and Agri-Food Canada (AAFC) as part of a study to detail Canada's beef supply chain. The study aims to identify the key nodes and flows in the beef supply chain, develop indicators of inputs and resources at various stages of the supply chain, and present statistics to provide a better understanding of Canada's beef supply chain. This report is accompanied by a dashboard which provides data visualizations for the beef supply chain.

The aspects of the beef supply chain studied pertain to production, processing, and distribution, as well as international and interprovincial trade that occurs at various points in the supply chain. In addition to this, the financial structure of beef farms and the level of employment in the industry are also included in the study. The primary sources of data for this study are those available at Statistics Canada.

In the primary production stage, from 2010-2019 the average annual increase in quantity of imported livestock to Canada was 42% and the average annual increase in monetary value of livestock imports was 59%. Virtually all livestock imports came from the US and the majority of livestock imports were transported by road.

According to the 2016 Census of Agriculture, the majority of beef cows were raised in Alberta and Saskatchewan. The price farmers received for cattle and calves increased by 72% from 2007 to 2019. The average net worth of beef ranchers and farmers increased 25% from 2013 to 2017, while their average net cash farm income (revenue - expenses) increased by 31% to \$44,872 over the same time period.

Relative to other provinces, Alberta reported the highest average revenue (\$3.0 million) and expenses (\$2.9 million) in 2018 within the beef cattle ranching and farming industry. Approximately 5% of employees in agricultural industries worked in the beef and feedlot industries, for a total of 14,267 employees in 2018. The number of temporary foreign workers in the cattle and ranch farming sector increased by 31% from 2016 to 2018 to a total of 1,548.

In terms of meat processing, from 2010 to 2019 the price of cattle for slaughter increased 62%. In 2018, the estimated output of farm production was 3.7 million cattle, of which approximately 3.2 million cattle were slaughtered for meat production.

Among beef products imported to Canada for distribution in 2019, fresh and chilled beef products were most highly imported in 2019 (69 million kilograms), and also contributed the most value (\$668 million). Similarly, Canada's beef products exports, fresh and chilled beef, peaked in 2019 (308 million kilograms), and also contributed the most value in terms of exports in 2019 (\$2.3 billion). The majority of beef imports to Canada and exports from Canada were by road, and the US was Canada's major trading partner for both imports and exports of beef products.

Price indices were assessed to provide information on what type of price changes were observed at different stages of the supply chain. The Consumer Price Index (CPI) indicated that the retail price of fresh and frozen beef increased 57% between 2010 and 2019.

Introduction

The COVID-19 pandemic has led to a health crisis, as well as an economic crisis which has been experienced by many sectors including the meat sector. According to the Canadian Cattlemen's Association (CCA), in 2020 "the impacts [of the novel virus] to the Canadian beef industry [were] expected to be immediate and drastic" (CTV News 2020). It was postulated that physical distancing measures implemented to mitigate the spread of the virus would have adverse effects on meat processing and the supply of beef in retail stores. Since the onset of the pandemic, the importance of having a better understanding of available data to monitor beef supply chains has been emphasised by stakeholders in the meat sector.

Supply-side disruptions, including labour shortages and disruptions to transportation networks and cross-border supply chains have affected food supply chains. These disruptions were coupled with demand-side shocks, which were exhibited by a shift in consumption patterns from food service operations to retail stores which have put additional stress on food supply chains (Hobbs 2020).

These disruptions have renewed the attention on supply chains, their organization, geographic dispersion, interdependencies, and a potential bottleneck. In turn, this has highlighted data gaps and the fragmentation of information on food supply chains. A number of studies were launched to fill these information gaps including one by the OECD. The study highlighted that the processing sector has been particularly disrupted by labour shortages and shutdowns, as clusters of COVID-19 were found in processing plants across various countries. Several meat processing plants were forced to shut down or reduce capacity. The impact of this disruption can be seen in Canada, as slaughter of cattle decreased 31.1% in April 2020 compared to the same period in 2019 (Patrice & Lamboni 2020). The movement of products along the food supply chain have also been affected by bottlenecks in transportation and logistics. These supply-side disruptions coupled with lower consumer demand for restaurants and soaring demand for food in retail stores has disconnected supply and demand for certain products creating simultaneous surpluses for producers and shortages for consumers, while for other products demand has declined leading to an oversupply (OECD 2020).

This paper is a first step in addressing these information gaps and in developing statistical products aimed at providing a comprehensive understanding of supply chains. This analysis focuses specifically on the beef supply chain. This is important as Canada is one of the largest exporter of beef in the world, and exported \$4.4 billion of red meat and cattle in 2019. Canada exports 47% of domestically produced cattle and beef, primarily to the United States (Canadian Cattlemen's Association 2020). The purpose of this report is to identify key nodes and flows in the beef supply chain, develop key indicators of inputs and resources at various stages of the supply chain, and present statistics to understand Canada's beef supply chains.

Previous disruptions in the Canadian beef sector

In Canada, major shocks to the beef industry were felt during the 2003 Mad Cow Disease (BSE) outbreak due to border closures to live animals. Between the second and third quarters in 2003, Canadian cattle prices fell 47%, feeder prices fell 20% and cull cow prices fell 64%. The 2003 BSE outbreak brought unprecedented difficulties mainly because packing plant shackle space was limited and there was nowhere for cull cattle to be slaughtered.

In 2011, there was a case of BSE which infected a dairy cow, and another case in 2015 infecting a beef cow. As a result of the 2015 case, several countries suspended imports of Canadian beef including China, Taiwan, Peru, Belarus, and South Korea (Johnson 2015). Prior to the ban in 2015, China was the fifth-largest importer of Alberta beef, accounting for \$39 million of the province's \$1.43 billion in annual beef exports (Edmonton Journal 2015), while approximately \$12 million of Canada's \$2 billion in total annual beef exports went to Taiwan, making it Canada's seventh largest beef market (Global News 2016). As many of these countries lifted their ban on Canadian beef in 2016, Mexico also lifted its 10-year-long ban on some Canadian cattle imports which was expected to be worth \$250 million to Canadian cattle ranchers. Mexico was among dozens of countries that suspended beef trade with Canada after the first BSE case was detected in 2003.

More recently, in June 2019, China announced a ban on beef and pork imports from Canada “after customs inspectors detected residue from a restricted feed additive in a batch of Canadian pork products” (Financial Post 2019). The ban was lifted in November 2019. The cost of the ban to Canadian farmers amounted to nearly \$100 million (CTV News 2019).

Due to COVID-19, similar shocks were experienced again including border closures, along with limited hook space in packing plants, and uncertainty about consumer reactions (Rude 2020).

Supply chain information

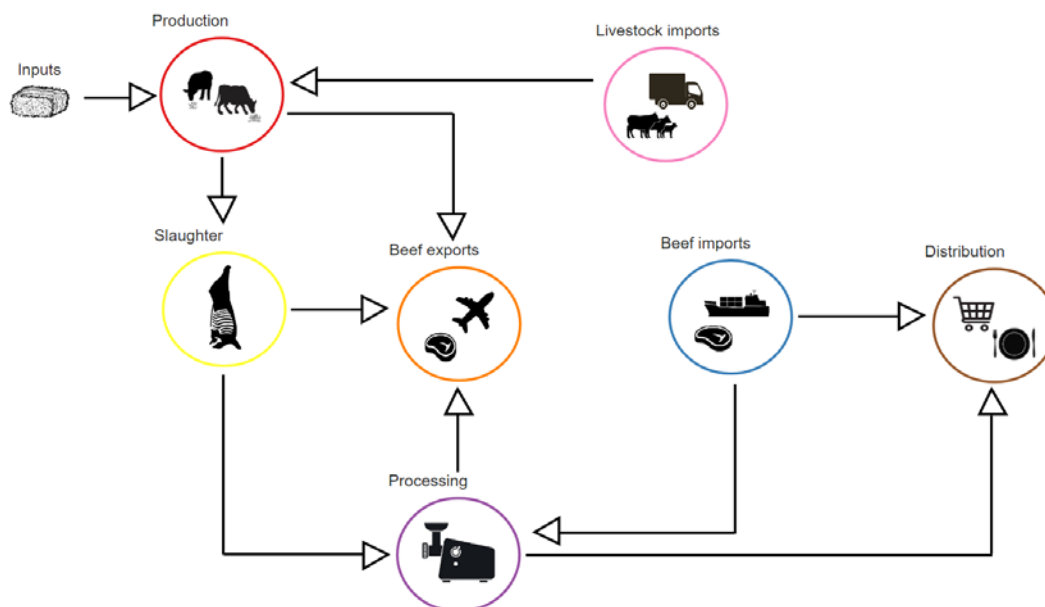
Against the backdrop described in the previous section, decision makers lack a comprehensive and detailed information system of the entire supply chains, which can provide an understanding of vulnerabilities, bottlenecks and full ramification of impacts nationally and in various regions. Hence, the first step in this analysis is a stylized representation of the entire beef supply chain, including nodes and flows.

Figure 1 displays the beef supply chain. Employing inputs such as land, feed, animal husbandry, and capital and equipment, the beef supply chain starts with the primary production stage. At this stage, calves are born and weaned (cow/calf operation), then raised on a forage diet to gain weight and muscle (backgrounding) before entering the feedlots where cattle are fattened up or finished with the objective of adding more muscle and intramuscular fat. A significant amount of value is added in this finishing and feedlot phase (Drouillard 2018). Finished cattle are sent to slaughterhouses. The slaughter by-products, carcasses and offal (such as livers, brains, hearts, kidneys and tongues) are exported or sent to a processing facility for further processing.

In the processing phase, domestic meats may be mixed with imported primary processed meats for further processing at a secondary processing facility. Custom meat cuts are prepared (smoking or curing meat) and finally packaged for distribution at a secondary processing facility or at a butchery. Packaged meat from the processing phase and imported processed beef products are distributed for consumption either via wholesalers/retailers, or food service operations.

Imports and exports of cattle occur at various stages of the supply chain. Livestock imports go through the primary production phase, while primary processed beef imports go through secondary processing before distribution. Processed beef imports are brought in for direct distribution and consumption. A portion of finished cattle, slaughtered cattle and secondary processed beef products are exported from Canada. For the supply chain to operate properly, labour inputs are needed at every stage in order to carry out the necessary production and processing tasks. Transportation of goods occurs between stages among the entities participating in the supply chain.

Figure 1
Structure of supply chain



Note: Livestock exports exist but are not shown in this diagram.

Data sources

The data presented in the following tables come from Statistics Canada's Linkable File Environment (LFE), the Census of Agriculture 2016, custom tabulations based on Statistics Canada programs, and published Statistics Canada tables (New Dissemination Model tables) which include survey and administrative data. The LFE links data from the Business Register (BR) to other administrative data sources, such as tax data, and is thus a rich source that provides information for different industries. The custom tabulations produced for this report are explained within the analysis accompanying the tables. Given that the methodology of the many data sources may differ, similar statistical measures in the tables may report different values. These discrepancies, as well as data limitations, will be discussed as they arise in the narrative. Below, the tables of the different aspects of the beef supply chain are organized to follow the structure in Figure 1: primary production, processing, and distribution.

The key indicators of price and quantity of products are identified at each stage of the supply chain. Due to the use of varied data sources, however, the units of measurement for the indicators can vary because consistent indicators across stages may not be available.

Inputs

Data on the inputs of beef cow supply chains including land, feed, animal husbandry, and capital and equipment used for the production and processing of cattle is scattered or in some cases incomplete at Statistics Canada.

However, Table 1 displays the operating expenses for beef ranchers and farmers from 2015 to 2018. Although this is not a perfect indicator of input costs, some information can be derived from farm operating expenses. In 2018, beef ranchers and farmers' operating expenses totalled nearly \$13.4 billion. Approximately 65% of those operating expenses were derived from livestock expenses (\$8.6 billion), which included livestock purchases, feed, supplements, veterinary fees, medications and breeding fees. General expenses (\$3.2 billion) such as salaries and wages, rent, insurance, utility payments, taxes and repairs and maintenance made up approximately 25% of total operating expenses. General expenses increased 6% from 2015 to 2018.

Table 1
Farm operating expenses for beef cattle ranching and farming, including feedlots,¹ 2015 to 2018

Expense estimates	2015	2016	2017	2018	Growth 2015-2018
	dollars (millions)				percent
Total operating expenses	13,316	12,056	12,280	13,371	0
Total crop expenses	657	589	546	600	-9
Total livestock expenses	8,638	7,632	7,888	8,576	-1
Total machinery expenses	970	854	886	971	0
Total general expenses	3,051	2,981	2,959	3,225	6

1. NAICS code 112110 - Beef cattle ranching and farming, including feedlots.

Source: Statistics Canada, Agriculture Taxation Data Program, Table 32-10-0136-01, 2018.

Primary production

In the beef supply chain, the primary production stage includes cow/calf operations, backgrounding and finishing and feedlots. Cattle auctions occur at various points within the primary production stage. At auctions, calves and cows from different breeds and farms are auctioned off, and can be bought from farms or ranches. Knowing the auction prices of calves and cows is important for knowing the value of the livestock at the beginning of the beef supply chain, and to better understand the price markups of beef as they progress through the supply chain. Auction data on beef cows does not exist at Statistics Canada.

Tables 2 and 3 present the key indicators of quantity and value for imported livestock in Canada respectively. Imports were determined based on Harmonized System (HS) Codes, a classification system that is used to classify traded goods for the purposes of customs. Livestock imports were captured by HS code 0102, which includes both pure-bred and non-pure-bred bovines, buffalos and cattle. This code, however, does not specify if live animals were imported for beef or dairy operations.

Table 2 presents the quantity of imported live bovine animals and cattle to Canada. These animals go through cow/calf operations, backgrounding and finishing. From 2010 to 2016, a downward trend in imported livestock can be observed as quantity decreased from nearly 56 thousand kilograms in 2010 to 32 thousand kilograms in 2016. However, the increase since 2016 has resulted in an average increase in quantity each year of 42% between 2010 and 2019, with quantities totalling 275,065 kilograms in 2019.

Table 2
Quantity of imported livestock to Canada, 2010 to 2019

Harmonized system code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual average percent change ²
	quantity										percent
Live bovine animals (0102) ¹	55,820	73,445	56,175	47,850	44,955	35,905	31,800	141,130	201,810	275,065	42

1. Includes bovines, buffalos and cattle pure-bred and non pure-bred.

2. The annual average percent change (AAPC) is presented.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 3 displays that the value of livestock imports increased from \$19 million in 2010 to \$267 million in 2019, representing a 59% annual average increase. Significant increases in both the quantity and value of imports were exhibited from 2016 to 2017, and from 2018 to 2019.

Table 3
Value of imported livestock to Canada, 2010 to 2019

Harmonized system code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual average percent change ²
	dollars (thousands)										percent
Live bovine animals (0102) ¹	19,565	40,860	31,265	25,195	24,490	28,245	38,595	182,870	199,465	266,950	59

1. Includes bovines, buffalos and cattle pure-bred and non pure-bred.

2. The annual average percent change (AAPC) is presented.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 4 displays the mode of transportation through which livestock was imported to Canada. In 2019, 100% of all livestock imported into Canada was transported via road.

Table 4
Mode of transportation of imported livestock to Canada, 2010 to 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Mode of transportation	percent									
Road	99	100	100	100	100	94	100	0	100	100
Air	1	0	0	0	0	0	0	0	0	0
Water	0	0	0	0	0	6	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100

Note: Percentages may not add up to 100 due to rounding.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 5 presents the country of origin for imported livestock over the same period, illustrating that all imported livestock to Canada came from the US, along with some re-imports back into Canada between 2010 and 2019.

Table 5
Country of origin of imported livestock to Canada, 2010 to 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Country of origin	percent									
Canada	0	0	2	1	1	0	0	0	0	0
United States	100	99	98	99	99	99	100	100	100	100
Total	100	100	100	100	100	100	100	100	100	100

Note: Percentages may not add up to 100 due to rounding.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

The following tables provide information on backgrounded and finished cattle for slaughter. Table 6 presents the number of farms reporting beef cows in the Census of Agriculture (CEAG), which collects data for all farms every five years (Statistics Canada 2016b). The number of farms reporting beef cows from 1996 to 2016 decreased across all ten provinces. By 2016, there were only half as many beef cow producing farms (53,837) as there were in 1996 (103,673) in Canada. A move away from individual smaller farms and into larger centralized locations such as in Saskatchewan (12,428) and Alberta (17,022) explains the decline in number of beef cow farms over the years.

Table 6
Number of farms reporting beef cows by province, 1996 to 2016

	1996	2001	2006	2011	2016
Province	count				
Newfoundland and Labrador	97	63	70	42	35
Prince Edward Island	784	559	550	386	320
Nova Scotia	1,520	1,205	1,132	944	767
New Brunswick	1,235	979	909	712	557
Quebec	8,470	6,130	5,699	4,575	3,805
Ontario	19,572	16,179	15,017	11,567	9,681
Manitoba	10,859	10,089	9,216	6,668	5,739
Saskatchewan	22,906	20,987	19,738	14,074	12,428
Alberta	32,048	28,510	25,665	18,618	17,022
British Columbia	6,182	5,365	5,004	3,839	3,483
Canada	103,673	90,066	83,000	61,425	53,837

Source: Statistics Canada, Census of Agriculture, Table 32-10-0155-01, 2016.

Table 7 displays the number of beef cows reported in the CEAG. From all agricultural operations enumerated in the 2016 Census, 3,732,555 beef cows were reported nationally, with the majority coming from Alberta (1,576,354) and Saskatchewan (1,093,496). These two provinces accounted for about two thirds of beef cow herd in Canada.

Table 7
Number of beef cows by province, 1996 to 2016

Province	1996	2001	2006	2011	2016
	count				
Newfoundland and Labrador	732	649	761	382	254
Prince Edward Island	16,472	13,251	16,107	10,207	9,391
Nova Scotia	32,068	26,500	25,925	18,329	16,269
New Brunswick	22,881	20,397	22,248	16,312	13,610
Quebec	231,891	207,852	226,236	187,332	145,057
Ontario	441,211	376,020	377,354	282,062	236,253
Manitoba	510,197	563,300	655,587	484,727	428,882
Saskatchewan	1,135,027	1,215,216	1,444,640	1,124,149	1,093,496
Alberta	2,016,889	2,099,288	2,035,841	1,530,391	1,576,354
British Columbia	273,217	279,927	276,897	195,477	212,989
Canada	4,680,585	4,802,400	5,081,596	3,849,368	3,732,555

Source: Statistics Canada, Census of Agriculture, Table 32-10-0155-01, 2016.

Table 8 presents the counts of cattle on beef operations from the Livestock Survey, a biannual survey that provides inventories of livestock animals on Canadian farms (Statistics Canada 2020b). The reference period for the survey estimates are January 1st and July 1st of each year. Table 8 presents a key indicator of quantity of livestock in Canada. On January 1st, 2020 a total of 9.3 million cattle were reported on beef operations and on July 1st, 2020, the same total reported was 10.4 million. The majority of reported beef cattle were on cow-calf operations where calves are born and weaned.

Table 8
Number of cattle by farm type, 2016-2020

Survey date	Farm type	2016	2017	2018	2019	2020
		head (thousands)				
At January 1	On beef operations	9,715	9,599	9,638	9,542	9,307
	On cow calf operations	6,744	6,691	6,578	6,443	6,246
	On feeder and stocker operations	1,587	1,543	1,609	1,691	1,620
	On feeding operations	1,384	1,366	1,451	1,408	1,441
At July 1	On beef operations	10,679	10,673	10,582	10,427	10,388
	On cow calf operations	6,885	6,907	6,769	6,693	6,629
	On feeder and stocker operations	2,240	2,209	2,287	2,297	2,321
	On feeding operations	1,555	1,557	1,526	1,437	1,438

Source: Statistics Canada, Livestock Survey Table: 32-10-0130-01, 2020.

Table 9 shows the supply and disposition of cattle from the Livestock Survey, which collects data for two occasions, January 1st and July 1st. The supply and disposition table integrates survey and administrative data to display the flow of cattle in Canada. In 2019, Canada's total supply of cattle was 15.4 million between January to June and 14.5 million between July to December. During the same reference period, Canada's total disposition of cattle was 3.1 million between January to June and 3.2 million between July to December.

The data on inventories of cattle are collected at a specific point in time and cannot be aggregated annually. In 2019, the beginning inventory of cattle was 11.5 million on January 1st and 12.3 million on July 1st. The ending inventory of cattle was 12.3 million on July 1st and 11.3 million on January 1st, 2020. Since most calves are born during the January to June period, and have higher mortality rates than cattle, the number of deaths and condemnations is higher for this period than the July to December period.

Table 9
Supply and disposition of cattle, 2015-2019

Supply and disposition of cattle	Survey date	2015	2016	2017	2018	2019
		head (thousands)				
Total supply of cattle	January to June	15,304	15,245	15,309	15,363	15,368
	July to December	14,425	14,406	14,631	14,582	14,459
Beginning inventory of cattle ¹	January to June	11,640	11,610	11,535	11,565	11,500
	July to December	12,615	12,530	12,535	12,465	12,300
Calves born	January to June	3,186	3,159	3,231	3,210	3,240
	July to December	1,012	1,114	1,116	1,137	1,096
Interprovincial imports of cattle	January to June	461	466	509	520	535
	July to December	780	743	874	846	882
International imports of cattle	January to June	18	11	35	68	94
	July to December	18	20	106	134	182
Total disposition of cattle	January to June	2,689	2,715	2,774	2,898	3,068
	July to December	2,815	2,871	3,066	3,082	3,194
Slaughter of cattle	January to June	1,386	1,458	1,570	1,682	1,762
	July to December	1,526	1,634	1,725	1,783	1,839
Interprovincial exports of cattle	January to June	461	466	509	520	535
	July to December	780	743	874	846	882
International exports of cattle	January to June	485	434	339	342	414
	July to December	346	332	302	289	309
Deaths and condemnations of cattle	January to June	358	358	357	354	358
	July to December	163	163	165	164	164
Ending inventory of cattle ¹	January to June	12,615	12,530	12,535	12,465	12,300
	July to December	11,610	11,535	11,565	11,500	11,265

1. For the January to June period, the beginning inventory is dated January 1 and the ending inventory is dated July 1. For the July to December period, the beginning inventory is dated July 1 and the ending inventory is dated January 1. The inventory data for each period cannot be aggregated to make an annual total. The inventory data is a count at a specific point in time.

Source: Statistics Canada, Livestock Survey, Table: 32-10-0139-01, 2019.

Table 10 displays the Farm Product Price Index (FPPI) of cattle and calves, which represents the price farmers received for cattle and calves. The FPPI increased 72% nationally from 2007 to 2019. British Columbia displayed the largest price increase over that period (103%), while Quebec exhibited the lowest price increase (31%). The price farmers received for cattle and calves increased substantially in 2015 across all provinces.

Table 10
Farm product price index (FPPI) of cattle and calves by province, 2007 to 2019

Province	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	index (2007=100) ¹												
Newfoundland and Labrador	101.3	103.5	107.1	109.2	133.2	144.4	146.7	199.6	239.1	179.1	175.9	170.1	168.5
Prince Edward Island	99.3	105.0	104.8	107.2	132.3	147.4	149.5	205.5	245.7	190.8	184.4	171.9	179.6
Nova Scotia	99.7	102.0	101.9	105.4	129.8	141.2	142.2	191.9	233.9	181.5	169.3	157.8	168.4
New Brunswick	99.3	98.5	99.2	102.0	124.1	137.2	136.6	180.1	225.5	181.8	177.2	168.9	154.5
Quebec	100.4	101.8	98.8	95.4	114.1	125.3	125.7	161.2	197.8	159.0	146.5	135.0	130.8
Ontario	100.8	101.3	101.4	100.9	117.5	120.2	126.3	168.5	198.1	163.4	158.2	143.5	142.2
Manitoba	100.7	92.8	95.4	100.7	117.9	128.5	130.9	189.8	236.0	177.3	181.0	177.6	179.3
Saskatchewan	101.3	95.1	99.8	111.2	132.1	146.0	144.1	212.8	264.8	189.8	190.3	187.2	193.5
Alberta	100.2	101.5	97.7	102.6	123.3	133.1	139.6	185.6	224.2	181.9	179.7	178.2	176.9
British Columbia	105.7	94.1	100.1	108.4	133.3	153.2	153.0	217.3	283.7	207.7	202.1	199.0	202.6
Canada	100.8	99.6	98.8	103.4	123.2	133.2	137.4	187.7	227.8	179.8	177.1	171.9	171.6

1. The FPPI in 2007 is not exactly 100 because the average of the monthly values were taken to obtain an annual value.

Source: Statistics Canada, Farm Product Price Index, Table 32-10-0098-01, 2019.

Information on the financial structure of beef farmers is presented in Tables 11 to 14.

Table 11 presents the financial structure of beef cattle ranchers and farmers from the biennial Farm Financial Survey. Prior to 2013, farms with a gross farm revenue equal to or greater than \$10,000 were included in the survey. However, from 2013 onwards the lower boundary for inclusion changed to include only farms with a gross farm revenue of \$25,000 or above (Statistics Canada 2020d). This change in eligibility criteria to participate in the survey could have contributed to the decrease in number of farms surveyed in 2013 and 2015. Due to the

change in the lower bound of gross farm revenue in 2013, the growth rate was computed from 2013 to 2017 in Table 11. Table shows that the number of farms surveyed for the 2013-2017 period increased by 22%. During this period beef ranchers and farmers' net worth (assets - liabilities) increased 25%, and their net cash farm income (revenue - expenses) increased by 31%.

Table 11
Financial structure of beef cattle ranching and farming, including feedlots,¹ 2011 to 2017

Financial structure	2011	2013	2015	2017	Growth 2013-2017
	count				percent
Number of farms	26,455	22,980	21,695	28,012	22
	dollars				percent
Total assets	1,547,650	1,947,343	2,472,127	2,467,232	27
Total liabilities	238,377	291,739	373,731	393,193	35
Net worth ²	1,309,273	1,655,604	2,098,396	2,074,038	25
Total revenue	282,923	345,318	534,642	390,579	13
Total expenses	262,276	311,118	477,935	345,707	11
Net cash farm income ³	20,647	34,200	56,707	44,872	31

1. Starting with reference year 2013, the lower boundary for inclusion of farms was set to gross farm revenue equal to or greater than \$25,000.

2. Net worth is the difference between market value of the farms assets and the value of the liabilities.

3. Net cash farm income is the difference between the farms total revenue and total expenses.

Source: Statistics Canada, Farm Financial Survey, Table 32-10-0102-01, 2017.

Tables 12 and 13 report statistics from the annual Agriculture Taxation Data Program, which provides detailed estimates of farm revenues and expenses based on unincorporated and incorporated tax filer records (Statistics Canada 2020a).

Table 12 shows the operating revenues of beef cattle ranchers and farmers. Total operating revenues decreased 5% from 2015 to 2018 while revenue derived from cattle products decreased 9%. In 2018, nearly 80% of beef cattle ranchers and farmers' total operating revenues (\$14.2 billion) came from cattle products (\$11.1 billion). Other revenues (\$2 billion) such as program payments, insurance proceeds, custom work and machine rentals made up 14% of beef cattle ranchers and farmers' total operating revenues, and increased 17% from 2015 to 2018.

Table 12
Farm operating revenues for beef cattle ranching and farming, including feedlots,¹ 2015 to 2018

Revenue estimates	2015	2016	2017	2018	Growth 2015-2018
	dollars (millions)				percent
Total operating revenues	15,081	13,543	13,494	14,260	-5
Total crop revenues	1,043	889	889	955	-9
Total livestock and animal product revenues	12,321	10,899	10,855	11,302	-8
Cattle	12,165	10,742	10,678	11,109	-9
Total other revenues	1,717	1,755	1,750	2,004	17

1. NAICS code 112110 - Beef cattle ranching and farming, including feedlots.

Source: Statistics Canada, Agriculture Taxation Data Program, Table 32-10-0136-01, 2018.

Table 13 displays farm net operating income (operating revenue – operating expenses) for beef cattle ranching and farming between 2015 and 2018. Farm net operating income was \$889 million in 2018, a 50% decrease from 2015. Taking depreciation of property and capital into consideration, beef ranchers and farmers' net operating income was \$42 million in 2018, a 95% decrease from 2015. A possible factor contributing to a decrease of this magnitude could be attributed to record high cattle prices in 2015 caused by low supplies of cattle in Canada and high demand from developing countries coupled with a depreciating Canadian dollar relative to the US dollar, thereby resulting in high Canadian cattle and beef prices from 2014 to 2015 (Statistics Canada 2016a).

Table 13
Farm net operating income for beef cattle ranching and farming, including feedlots,¹ 2015 to 2018

Net operating income estimates	2015	2016	2017	2018	Growth 2015-2018
	dollars (millions)				percent
Net operating income	1,765	1,487	1,214	889	-50
Net program payments	183	210	304	344	88
Net market income	1,582	1,277	910	545	-66
Net operating income adjusted for capital cost allowance	884	670	378	42	-95

1. NAICS code 112110 - Beef cattle ranching and farming, including feedlots.

Source: Statistics Canada, Agriculture Taxation Data Program, Table 32-10-0136-01, 2018.

Table 14 presents the average total revenue, expenses and net revenue of beef ranchers and farmers by province using administrative T2 tax data from the Linkable File Environment (LFE). Of all active businesses in the beef ranching and farming industry (53,848), only businesses who reported positive revenue (4,903) and positive expenses (4,937) were taking into consideration. Alberta reported the highest average total revenue (\$3.0 million) and expenses (\$2.9 million) in 2018. British Columbia reported the largest average net revenue (\$193,578), while Prince Edward Island's average net revenue suggested that the beef ranching and farming industry was in a deficit (-\$9,641). Data was not available for the Northwest Territories.

Table 14
Average revenue and expenses of beef cattle ranching and farming, including feedlots,¹ 2018

Province/Territory	Average revenue ²	Average expenses ²	Average net revenue
	dollars		
Newfoundland	375,768	367,142	8,626
Prince Edward Island	479,645	489,287	-9,641
Nova Scotia	244,387	231,678	12,709
New Brunswick	1,069,995	990,300	79,695
Quebec	1,146,990	1,039,129	107,861
Ontario	2,799,308	2,613,712	185,596
Manitoba	1,597,955	1,506,657	91,299
Saskatchewan	831,580	792,064	39,517
Alberta	3,027,263	2,921,676	105,587
British Columbia	916,965	723,387	193,578
Northwest Territories
Yukon	324,669	234,817	89,852

.. not available for a specific reference period

1. NAICS code 112110 - Beef cattle ranching and farming, including feedlots.

2. General Index of Financial Information (GIFI).

Source: Statistics Canada, Linkable File Environment, 2018.

To fully understand the primary production sector of the beef supply chain, it is worthwhile to also examine employment in the industry. Tables 15 to 17 present statistics on employment in the beef and feedlots industry.

Table 15 presents the number of employees in the beef and feedlot industry. In 2018, a total of 268,779 employees reported working in agricultural industries,¹ of which approximately 5% worked in beef and feedlot industries (14,267). To contextualize this number, beef and feedlot industries (4,152) made up 10% of agricultural operations with at least one employee (39,223) in 2018.

1. Crop production (NAICS 111) and animal production (NAICS 112 excluding aquaculture) industries.

Table 15
Employees in the beef and feedlot industry, Canada,¹ 2016 to 2018

Industry	Total number of employees			Growth	Agricultural operations with at least one employee			Growth
	2016	2017	2018	2016-2018	2016	2017	2018	2016-2018
	count			percent	count			percent
Total agricultural industries	265,797	266,140	268,779	1	39,978	39,436	39,223	-2
Beef and feedlots ²	14,511	14,228	14,267	-2	4,334	4,199	4,152	-4

1. Agricultural operations in the territories were excluded.

2. NAICS code 11211.

Source: Statistics Canada, Table 32-10-0215-01, 2018.

Table 16 presents the number of jobs filled by temporary foreign workers in the cattle and ranch farming industry based on Statistics Canada survey data and administrative data. It is worth noting that this data was only available for the 4-digit NAICS codes 1121, which combines dairy and beef cattle together. In 2018, 54,734 temporary foreign workers were reported working in all agricultural industries, while 1,548 temporary foreign workers were reported in the cattle ranching farming industry, a 31% increase from 2016. Furthermore, in 2018, of the 3,846 agricultural operations with at least one temporary foreign worker reported, 501 were cattle and ranch farms.

Table 16
Jobs filled by temporary foreign workers in the cattle and ranch farming sector, Canada,¹ 2016 to 2018

Industry	Jobs filled by temporary foreign workers			Growth	Agricultural operations with at least one temporary foreign worker			Growth
	2016	2017	2018	2016-2018	2016	2017	2018	2016-2018
	count			percent	count			percent
Total agricultural industries	48,585	50,641	54,734	13	3,630	3,634	3,846	6
Cattle and ranch farming ²	1,179	1,041	1,548	31	383	377	501	31

1. Agricultural operations in the territories were excluded.

2. NAICS code 1121.

Source: Statistics Canada, Table 32-10-0218-01, 2018.

Table 17 presents the average number of employees in the beef ranching and farming industries using the Business Register and Payroll Deduction (PD7) form that all businesses with employees are required to fill. The average was taken of active businesses with one or more employee (3,072 businesses). Newfoundland and Labrador, Alberta and British Columbia had the largest average number of employees (four), followed by Quebec and Ontario (three). It is worth noting that the sample size in the Atlantic Provinces and the Territories were smaller relative to the other provinces. It is possible that this could have skewed the data on average number of employees that is reported in the table below. Data was not available for the Northwest Territories and Yukon.

Table 17
Average number of employees of beef cattle ranching and farming, including feedlots,¹ 2018

Province/Territory	Average number of employees
	dollars
Newfoundland	4
Prince Edward Island	2
Nova Scotia	2
New Brunswick	2
Quebec	3
Ontario	3
Manitoba	2
Saskatchewan	2
Alberta	4
British Columbia	4
Northwest Territories	..
Yukon	..

.. not available for a specific reference period

1. NAICS code 112110 - Beef cattle ranching and farming, including feedlots.

Source: Statistics Canada, Linkable File Environment, 2018.

Processing

After primary production, finished cattle are slaughtered and proceed to the processing stage of the value chain where secondary processing and butchery occur.

Table 18 displays the cold dressed weight and total edible offal of cattle and calves from the Livestock Survey. The cold dressed weight is the weight of the carcass after being partially butchered (removing internal organs), and the edible offal are the internal organs or other parts of the carcass that have been butchered or skinned. Compared to 2014, the average cold dressed weight of cattle (387 kg) and calves (151 kg) increased approximately 5% in 2019. Similarly, the total edible offal weight of cattle (38,825 tonnes) increased 17% from 2014 to 2019, while offal of calves (995 tonnes) decreased 14% from 2014 to 2019.

Table 18
Cold dressed weight and edible offal of cattle and calves, 2014 to 2019

Livestock statistics		2014	2015	2016	2017	2018	2019	Growth 2014-2019	
		kilograms							percent
Average cold dressed weight	Cattle	367	379	390	383	381	387	5	
	Calves	142	147	144	145	148	151	6	
Edible offal		tonnes							percent
	Cattle	33,250	30,884	32,698	34,995	37,102	38,825	17	
	Calves	1,155	1,043	1,097	1,101	1,063	995	-14	

Source: Statistics Canada, Livestock Survey, Table 32-10-0125-01, 2019.

Tables 19 and 20 present the key indicators of price and quantity respectively for slaughtered cattle.

Table 19 presents the price of cattle for slaughter from the Farm Product Price Survey which collects prices received by farmers for agricultural commodities produced and sold (Statistics Canada 2020e). The live weight price of cattle is typically presented in dollars per hundredweight (\$/100lbs), however to compare with livestock statistics such as those displayed in Table 18, the price of cattle for slaughter in Table 19 is presented here in dollars per kilogram. In 2019, the price of cattle for slaughter increased 62% from 2010. The price of cattle was highest in 2015 (\$32.68/kg) due to low supplies of cattle in Canada and high demand for cattle from developing countries coupled with a depreciating Canadian dollar relative to the US dollar leading to record high Canadian cattle prices in 2015 (Statistics Canada 2016a).

Table 19
Average farm product prices of cattle for slaughter, 2010 to 2019

Farm product price	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth 2010-2019
	dollars per kilograms										percent
Cattle for slaughter	14.92	16.38	19.83	20.29	27.44	32.68	26.03	25.54	24.13	24.10	62

Source: Statistics Canada, Farm Product Price Survey, Table 32-10-0077-01, 2019.

Table 20 shows the number of cattle and calves processed for meat production based on the Livestock Survey and administrative data. In 2018, the estimated output of farm production was 3.7 million cattle, of which approximately 3.2 million cattle were slaughtered for meat production, nearly 550,000 livestock animals were exported, while a smaller proportion were imported for slaughter (14,000). Livestock imports for slaughter increased 315% and 341% for cattle and calves respectively, from 2014 to 2018.

Table 20
Cattle and calves for farm and meat production, 2014 to 2018

Livestock statistics		2014	2015	2016	2017	2018	Growth 2014-2018
		head (thousands)					percent
Total slaughterings, farm and meat production	Cattle	2,911	2,682	2,850	3,052	3,230	11
	Calves	255	230	242	243	234	-8
Inspected slaughterings of farm production	Cattle	2,891	2,662	2,830	3,032	3,210	11
	Calves	249	224	236	237	229	-8
Uninspected slaughterings of farm production	Cattle	20	20	20	20	20	0
	Calves	6	6	6	6	6	-2
Estimated output of farm production	Cattle	3,868	3,337	3,527	3,597	3,764	-3
	Calves	499	370	299	200	135	-73
Live imports for slaughter of farm production	Cattle	3	5	10	29	14	315
	Calves	41	31	22	109	182	341
Live exports of farm production	Cattle	960	660	687	574	548	-43
	Calves	285	172	79	67	83	-71

Source: Statistics Canada, Livestock Survey, Table 32-10-0125-01, 2018.

Distribution

Meat from the processing stage and imported processed beef products are either distributed for consumption (either via wholesalers/retailers, or food services) or exported.

There is no specific count of operators in this segment of the supply chain because there is no specialized distribution for beef. Processed meat that reaches the domestic market goes to generic food retail stores or through the food services industry (ex. restaurants).

Table 21 displays the stocks of frozen and chilled meats collected from the Quarterly Stocks of Frozen and Chilled Meat Survey (Statistics Canada 2020g). In 2019, 143,999 tonnes of beef were processed, of which 80% was boneless beef. Although bone-in beef contributed a smaller proportion of frozen and chilled beef stocks, it exhibited the largest increase from 2010 to 2019 (136%). Since 2010, the total stock of frozen and chilled beef has increased 75%, while the stock of frozen and chilled veal has decreased 39%. Fancy beef and veal are categories which includes tails, headmeat, weasand meat, gullets, neck trim and blood plasma.² Since 2010, the stock of fancy beef and fancy veal declined by 7% and 43% respectively.

Table 21
Stock of frozen and chilled meats,¹ 2010 to 2019

Farm product price	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth 2010-2019
	tonnes										percent
Beef, total	82,153	73,550	88,948	104,280	118,641	145,761	141,652	128,117	132,656	143,999	75
Beef, bone-in	12,620	10,220	10,184	10,891	24,113	30,481	31,251	25,998	23,805	29,794	136
Beef, boneless	69,534	63,329	78,764	93,387	94,527	115,278	110,401	102,118	108,853	114,206	64
Veal, total	8,203	4,328	4,320	4,300	3,946	5,021	5,716	5,494	4,017	4,968	-39
Veal, bone-in	2,192	699	598	842	847	1,507	938	520	948	427	-81
Veal, boneless	6,012	3,630	3,721	3,458	3,100	3,514	1,550	1,505	3,068	4,401	-27
Fancy beef	13,609	14,526	11,774	10,165	8,898	7,511	8,536	10,830	8,042	12,660	-7
Fancy veal	373	380	384	376	334	318	409	144	546	213	-43

1. Domestic and imported meat.

Source: Statistics Canada, Quarterly Stocks of Frozen and Chilled Meats Survey, Table 32-10-0137-01, 2019.

Table 22 displays the stocks of imported beef and veal to Canada from the Quarterly Stocks of Frozen and Chilled Meat Survey. Stocks of beef and veal imports have increased from 2010 to 2019. In 2019, the majority of imports were boneless beef (43,585 tonnes), which increased 145% from 2010 to 2019. Veal imports increased 341% from 2010 to 2019, to 1,945 tonnes.

2. Fancy meat products include brain, livers, sweetbreads, tongues, stomachs, kidneys and lungs and other glands for pharmaceuticals, include stocks held at the site and held for exports.

Table 22
Stocks of imported beef and veal, 2010 to 2019

Type of meat	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth 2010-2019
	tonnes										percent
Total beef and veal	19,465	24,635	24,672	24,094	25,544	53,617	60,812	53,128	48,283	48,275	148
Beef, boneless	17,808	22,629	22,276	20,736	20,442	44,971	52,488	47,049	43,691	43,585	145
Beef, bone-in	1,216	1,674	1,945	2,420	3,961	6,168	4,885	3,191	2,636	2,745	126
Total veal	441	332	451	938	1,141	2,478	3,439	2,888	1,956	1,945	341

Source: Statistics Canada, Quarterly Stocks of Frozen and Chilled Meats Survey, Table 32-10-0138-01, 2019.

Table 23 displays the interprovincial and international trade of cattle and calves. In 2016, Saskatchewan was the largest interprovincial exporter (\$1 billion), exporting approximately 70% of its livestock to Alberta, who was the largest importer of livestock (\$1.1 billion) of all the provinces. Alberta was the largest international exporter of livestock (\$600 million), and British Columbia imported the most (\$24 million) livestock internationally, relative to the other provinces. Alberta reported the largest supply (\$4.7 billion) and demand (\$4.6 billion) of cattle and calves in 2016.

Table 24 highlights the interprovincial and international trade of processed fresh and frozen beef products. In 2016, Alberta was the largest interprovincial exporter (\$2.4 billion), exporting slightly more beef products to Quebec (36%) than they retained within their own province (33%). As a result, Quebec was the largest interprovincial importer (\$1.0 billion). Alberta also reported the largest international exports of beef (\$1.6 billion), while Ontario reported the largest amount of international beef imports (\$790 million). Ontario reported the largest supply of fresh and frozen beef between interprovincial and international imports (\$2.6 billion) while Alberta reported the highest total demand for fresh and frozen beef (\$4.8 billion) in 2016. The large amount of livestock exported out of Saskatchewan, as displayed in Table 25, can explain Saskatchewan's low level of trade flow relative to other provinces.

Table 23
Supply use - Interprovincial and international trade flows of cattle and calves, 2016¹

	Destination							
	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan
	dollars (thousands)							
Newfoundland and Labrador	2,358	18,439	940	0	0	0	0	0
Prince Edward Island	0	13,291	0	0	10,057	1,095	0	0
Nova Scotia	0	15,600	547	0	11,357	4,384	0	0
New Brunswick	0	987	0	7,151	4,650	5,632	0	0
Quebec	0	0	0	0	284,787	208,398	0	0
Ontario	0	0	0	0	56,427	1,127,159	197	0
Manitoba	0	0	0	0	44,013	78,354	66,743	2,997
Saskatchewan	0	0	0	0	9,972	290,198	43,944	97,841
Alberta	0	0	0	0	2,591	275,113	16,754	99,891
British Columbia	0	0	0	0	0	2,229	0	203
Yukon	0	0	0	0	0	0	0	0
Northwest Territories	0	29,878	0	0	0	0	0	0
Total interprovincial imports	0	0	940	0	139,067	865,403	60,895	103,091
International imports	0	48,317	0	7	1,595	8,684	2,790	583
Total supply	2,358	0	1,487	7,158	425,449	2,001,246	130,428	201,515

	Destination							Total demand
	Alberta	British Columbia	Yukon	Northwest Territories	Total interprovincial exports	International exports	International re-exports	
	dollars (thousands)							
Newfoundland and Labrador	0	0	0	0	940	0	0	3,298
Prince Edward Island	0	0	0	0	11,152	11	0	29,602
Nova Scotia	0	0	0	0	29,032	79	0	29,658
New Brunswick	0	0	0	0	25,882	12,966	0	45,999
Quebec	0	0	0	0	209,385	109,743	0	603,915
Ontario	0	0	0	0	56,624	192,986	0	1,376,769
Manitoba	216,956	0	0	0	342,320	158,490	0	567,553
Saskatchewan	744,556	259	0	0	1,088,929	207,737	0	1,394,507
Alberta	3,602,236	5,375	0	0	399,724	604,184	0	4,606,144
British Columbia	183,503	9,571	0	0	185,935	49,006	0	244,512
Yukon	0	55	62	0	55	0	0	117
Northwest Territories	0	7	0	0	7	0	0	7
Total interprovincial imports	1,145,015	5,696	0	0	0	0	0	2,349,985
International imports	1,634	24,295	0	0	0	0	0	39,588
Total supply	4,748,885	39,562	62	0	2,349,985	1,335,202	0	8,941,669

1. Based on the Supply Use Product Classification (SUPC).

Source: Statistics Canada, Supply Use and Input Output Tables 36-10-0478, 36-10-0479, 36-10-0438, 2016.

Table 24
Supply use - Interprovincial and international trade flows of fresh and frozen beef, 2016¹

	Destination								
	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta
	dollars (thousands)								
Newfoundland and Labrador	295	0	0	0	0	0	0	0	0
Prince Edward Island	4,543	10,042	25,719	3,852	2,834	8,653	0	0	0
Nova Scotia	0	137	3,403	1,096	0	206	0	131	97
New Brunswick	0	0	0	0	0	0	0	0	0
Quebec	177	992	1,598	1,961	209,004	11,946	903	1,028	6,294
Ontario	16,148	6,921	20,142	37,100	122,887	1,193,604	28,109	11,576	40,994
Manitoba	1,421	734	2,001	310	2,282	7,701	24,026	6,574	7,265
Saskatchewan	0	0	0	0	0	0	36	1,103	81
Alberta	162	91	57,747	56,885	870,573	557,044	87,749	95,373	795,358
British Columbia	0	0	5,068	1,683	8,964	20,646	5,412	1,566	17,342
Total interprovincial imports	22,451	8,875	112,275	102,887	1,007,540	606,196	122,209	116,248	72,073
International imports	51,341	133	748	470	220,090	789,570	74,879	32,420	10,565
Total supply	74,087	19,050	116,426	103,357	1,436,634	2,589,370	221,114	149,771	877,996

	Destination								
	British Columbia	Yukon	Northwest Territories	Nunavut	Canadian territorial enclaves abroad	Total interprovincial exports	International exports	International re-exports	Total demand
	dollars (thousands)								
Newfoundland and Labrador	0	0	0	0	0	0	0	0	295
Prince Edward Island	0	0	0	0	0	45,601	0	0	55,643
Nova Scotia	88	0	0	0	0	1,755	213	0	5,371
New Brunswick	0	0	0	0	0	0	0	0	0
Quebec	3,301	0	0	0	0	28,200	97,377	0	334,581
Ontario	101,421	0	0	0	0	385,298	426,784	0	2,005,686
Manitoba	3,224	1,442	528	0	0	33,482	1,116	0	58,624
Saskatchewan	17	0	0	0	0	134	1,313	0	2,550
Alberta	680,305	0	775	0	0	2,406,704	1,629,641	0	4,831,703
British Columbia	129,853	0	0	0	0	60,681	3,508	0	194,042
Total interprovincial imports	788,356	1,442	1,303	0	0	0	0	0	2,961,855
International imports	15,279	4,380	6,965	548	123	0	0	578	1,208,089
Total supply	933,488	5,822	8,268	548	123	2,961,855	2,159,952	578	8,696,584

1. Based on the Supply Use Product Classification (SUPC).

Source: Statistics Canada, Supply Use and Input Output Tables 36-10-0478, 36-10-0479, 36-10-0438, 2016.

Statistics on imports of beef products to Canada are presented in Tables 25 to 28. Tables 25 and 26 present the key indicators of quantity and value of imported beef products to Canada respectively. Table 25 presents the quantity of imported beef products. In 2019, fresh and chilled beef products were the commodities most imported (69 million kilograms) followed by frozen beef products (48 million kilograms). The stock of fresh and chilled beef imports (23%), edible offal (19%) and frozen meat (1%) all decreased from 2010 and 2019, suggesting that Canada is becoming less reliant on these imports. Imports of cured meat, however, increased 289%.

Table 25
Quantity of imported beef products to Canada, 2010 to 2019

Harmonized System Code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth 2010-2019
	kilograms (thousands)										percent
Total	151,780	179,220	193,095	183,960	172,885	172,155	159,120	145,825	147,035	127,900	-16
Fresh or chilled meat of bovine animals (0201)	90,650	118,460	124,695	123,310	87,260	77,175	77,595	79,990	77,325	69,440	-23
Frozen meat of bovine animals (0202)	48,760	48,730	54,775	50,560	75,395	82,855	69,505	56,710	58,870	48,375	-1
Bovine edible offal, tongues, livers, and nes ¹ (02061, 02062)	12,340	11,970	13,605	10,055	10,215	12,095	11,920	9,020	10,755	9,975	-19
Cured bovine meat (0210)	30	55	25	35	15	25	100	105	85	110	289

1. nes = not elsewhere specified

Note: Harmonized System Codes 0201, 0202, 02061 and 02062 also include bison.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 26, presents the value of imported beef products to Canada, and indicates that the majority (67%) of imported beef products were fresh or chilled meat which had the highest value in 2019 (\$668 million), though its value of imports only increased 17% from 2010 to 2019. Frozen beef products (\$286 million) made up 29% of beef imports. Both frozen beef products and edible offal increased in value by approximately 67% from 2010 to 2019. Cured bovine meat imports to Canada increased in value by 247% from 2010 to 2019.

Table 26
Value of imported beef products to Canada, 2010 to 2019

Harmonized System Code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth 2010-2019
	dollars (thousands)										percent
Total	765,615	1,023,280	1,194,890	1,198,835	1,237,165	1,327,805	1,134,075	1,115,530	1,092,140	991,570	30
Fresh or chilled meat of bovine animals (0201)	571,750	799,285	936,500	961,110	856,105	847,315	748,300	772,615	726,225	667,960	17
Frozen meat of bovine animals (0202)	171,810	195,795	229,250	213,815	354,145	442,945	356,620	313,390	332,505	286,405	67
Bovine edible offal, tongues, livers, and nes ¹ (02061, 02062)	21,745	27,655	28,880	23,505	26,745	37,310	28,650	28,745	32,620	36,120	66
Cured bovine meat (0210)	315	540	260	410	165	235	505	785	785	1,085	247

1. nes = not elsewhere specified

Note: Harmonized System Codes 0201, 0202, 02061 and 02062 also include bison.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 27 displays the mode of transportation used for the imports of beef products into Canada. The majority of imports were by road (79%) in 2019. Imports transported via water in 2019 (18%) increased, compared to 2010 (13%).

Table 27
Mode of transportation of imported beef products¹ to Canada, 2010 to 2019

Mode of transportation	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	percent									
Road	78	82	80	86	81	78	77	81	81	79
Water	13	8	10	11	16	19	21	15	15	18
Rail	9	9	10	3	2	3	2	3	3	1
Air	0	0	0	0	0	0	0	1	0	1
Total	100	100	100	100	100	100	100	100	100	100

1. For Harmonized System Codes 0201, 0202, 02061, 02062 and 0210.

Note: Percentages may not add up to 100 due to rounding.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 28 displays the countries from which Canada imports beef products. The United States has consistently been the top country from which Canada imports beef, although the percentage of imports has decreased from 81% to 66% between 2010 and 2019. This decrease can likely be attributed to Canada diversifying to include imports from many other countries since 2010.

Table 28
Country of origin of imported beef products to Canada, 2010 to 2019

Country of origin	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	percent									
Australia	4	4	5	6	14	17	13	11	13	11
Chile	0	0	0	0	0	0	0	0	1	1
Germany	0	0	0	0	0	0	0	0	0	1
Ireland	0	0	0	0	0	0	0	0	0	1
Italy	0	0	0	0	0	0	0	0	0	1
Mexico	0	0	0	0	1	1	2	2	3	5
Netherlands	0	0	0	0	0	0	0	0	0	1
New Zealand	10	9	8	5	6	10	10	10	9	8
United Kingdom	0	0	0	0	0	0	0	0	0	2
United States	81	84	83	84	73	65	67	70	67	66
Uruguay	5	2	4	4	7	6	7	5	5	4
Total	100	100	100	100	100	100	100	100	100	100

Note: Percentages may not add up to 100 due to rounding.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Statistics on exports of beef products from Canada are presented in Tables 29 to 32. Table 29 shows the quantity of beef exports from Canada over the period between 2010 and 2019. Exports of frozen beef products (53%) and edible offal (36%) increased from 2010 to 2019, while exports of fresh and chilled beef (4%), and cured meat (23%) decreased.

Table 29
Quantity of exported beef products from Canada, 2010 to 2019

Harmonized System Code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth 2010-2019
	kilograms (thousands)										percent
Total	406,775	335,090	270,405	277,705	315,525	319,940	355,520	373,495	393,675	433,795	7
Fresh or chilled meat of bovine animals (0201)	320,120	247,125	185,360	183,605	209,235	213,865	247,025	258,780	280,930	308,085	-4
Frozen meat of bovine animals (0202)	51,020	54,975	51,915	51,685	57,380	65,965	62,165	66,295	70,290	78,130	53
Bovine edible offal, tongues, livers, and nes ¹ (02061, 02062)	34,320	31,880	32,065	41,450	47,675	38,855	45,625	47,485	41,570	46,560	36
Cured bovine meat (0210)	1,320	1,110	1,060	965	1,240	1,255	705	940	880	1,020	-23

1. nes = not elsewhere specified

Note: Harmonized System Codes 0201, 0202, 02061 and 02062 also include bison.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 30 displays the value of Canadian beef exports. In 2019, the majority of the value obtained from beef exports came from fresh and chilled beef (\$2.3 billion). Since 2010, the value of fresh and chilled beef (112%), frozen beef (172%) and edible offal (136%) increased significantly.

Table 30
Value of exported beef products from Canada, 2010 to 2019

Harmonized System Code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth 2010-2019
	dollars (thousands)										percent
Total	1,426,770	1,331,635	1,209,040	1,329,175	1,920,365	2,210,400	2,232,895	2,362,875	2,701,155	3,162,490	122
Fresh or chilled meat of bovine animals (0201)	1,110,055	982,815	841,085	862,005	1,293,070	1,492,860	1,592,295	1,680,650	1,979,995	2,348,265	112
Frozen meat of bovine animals (0202)	201,245	208,050	211,745	279,395	362,025	462,870	386,490	436,945	496,365	547,975	172
Bovine edible offal, tongues, livers, and nes ¹ (02061, 02062)	110,495	136,020	151,270	183,005	259,825	248,910	250,805	240,985	220,595	261,100	136
Cured bovine meat (0210)	4,975	4,750	4,940	4,765	5,450	5,755	3,305	4,295	4,205	5,155	4

1. nes = not elsewhere specified.

Note: Harmonized System Codes 0201, 0202, 02061 and 02062 also include bison.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 31 displays the mode of transportation used to export beef products from Canada. The majority of exports were transported by road (75%), followed by water (24%) in 2019. From 2010 to 2019, road transportation decreased while transportation via water increased.

Table 31
Mode of transportation of exported beef products from Canada, 2010 to 2019

Mode of Transportation	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	percent									
Road	86	83	81	77	77	77	79	78	77	75
Water	14	16	19	22	22	22	20	21	22	24
Air	0	0	0	1	1	0	1	0	0	0
Total	100	100	100	100	100	100	100	100	100	100

1. For Harmonized System Codes 0201, 0202, 02061, 02062 and 0210.

Note: Percentages may not add up to 100 due to rounding.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Table 32 displays the countries that receive Canadian beef exports. The majority of beef exports went to the US (72%) in 2019, which remained relatively the same since 2010.

Table 32
Country of destination of exported beef products from Canada, 2010 to 2019

Country of destination	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	percent									
China	0	0	0	2	2	12	3	4	4	3
Cuba	1	0	0	0	0	0	0	0	0	0
Hong Kong	5	7	6	12	10	4	7	7	6	5
Japan	6	5	6	6	5	4	6	7	8	11
Macao	0	0	0	1	0	0	0	0	0	0
Mexico	11	11	9	7	8	7	5	5	4	4
Russian Federation	2	2	1	0	0	0	0	0	0	0
South Korea	0	0	1	1	1	0	2	1	1	1
Taiwan	1	0	0	0	1	0	0	1	1	1
United Kingdom	0	0	0	0	0	0	0	0	0	1
United States	72	72	72	68	69	70	73	73	73	72
Total	100	100	100	100	100	100	100	100	100	100

Note: Percentages may not add up to 100 due to rounding.

Source: Statistics Canada, Canadian International Merchandise Trade Database, 2019.

Prices

Given that the value of a product increases as it proceeds through the stages of a supply chain, it would be ideal if the value of a product at each stage of the beef supply chain were collected by the entity involved in that stage in order to capture the price markup at different stages of the supply chain. Due to limited data available for beef products, this was not feasible for the beef supply chain. However, price indices are collected at different stages of production and distribution of a good at Statistics Canada, and can provide some information on the prices of beef products.

The following tables display both cattle and beef prices reaching record highs in 2015. This was attributed to Canadian beef cow herds contracting resulting in record low levels of supply since 1991. A similar contracting in cow herds were also experienced in the US. Due to low supply, for the first half of 2015 slaughter was down in both Canada (13.5%) and the US (7%) resulting in slaughter remaining low for the year. During the same time period, demand for beef from developing countries was increasing, while global beef production was stagnating, and competing meat markets such as the US were expanding slower than expected. Along with these supply and demand factors, the depreciating Canadian dollar relative to the US dollar also contributed to higher Canadian cattle and beef prices from March 2014 to March 2015 (Statistics Canada 2016a).

Table 33 presents the Raw Materials Price Index (RMPI) for cattle and calves. The RMPI measures the price changes for raw materials purchased for further processing by manufacturers operating in Canada (Statistics Canada 2020h). This includes all charges incurred to bring a commodity to the establishment gate. Table 33 shows that while the price of cattle and calves increased 51% from 2010 to 2019, after reaching a peak in 2015 there was a large decline up to 2019.

Table 33
Raw materials price index, 2010 to 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
North American Product Classification System (NAPCS)	index (2010=100)									
Cattle and calves (11111)	100.0	117.4	124.9	130.8	173.3	203.9	162.3	162.8	155.7	150.8

Source: Statistics Canada, Raw Materials Price Index, Table 18-10-0034-01, 2019.

Table 34 presents the Industrial Product Price Index (IPPI) for beef products. The IPPI measures price changes for major commodities sold by manufacturers operating in Canada. The prices covered by the IPPI refer to what the producer receives rather than what a purchaser pays (Statistics Canada 2020f). The IPPI excludes all indirect taxes, such as sales taxes and tariffs. Fresh and frozen ground beef increased the most (93%) from 2010 to 2019. Fresh and frozen cuts of beef (41%) and fresh and frozen veal (40%) increased the same amount, while fresh and frozen carcasses and half-carcasses of beef and veal increased 31%. The notable peak in beef product prices can be seen in 2015.

Table 34
Industrial product price index, by product, 2010 to 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
North American Product Classification System (NAPCS)	index (2010=100)									
Fresh and frozen carcasses and half-carcasses of beef and veal (172111)	100.0	103.9	103.9	113.3	135.7	165.1	141.2	139.2	132.5	130.9
Fresh and frozen cuts of beef (172112)	100.0	103.9	103.9	108.8	128.0	147.6	134.1	133.0	138.3	140.6
Fresh and frozen ground beef (172113)	100.0	101.8	132.4	134.8	164.0	192.8	172.3	187.1	187.7	193.2
Fresh and frozen veal (except carcasses and half-carcasses) (172114)	100.0	106.0	109.1	107.6	129.2	152.7	135.2	138.7	138.5	140.4

Source: Statistics Canada, Industrial Product Price Index, Table 18-10-0030-01, 2019.

Table 35 displays the Wholesale Services Price Index (WSPI) for live animal merchant wholesalers. This index decreased 50% from 2013 to 2019 (Statistics Canada 2020j). It is worth mentioning that live animal merchant wholesales (NAICS 41111) include many animals, not just cattle, thus the results cannot be considered to be directly attributable to changes in the beef supply chain.

Table 35
Wholesale services price index, 2010 to 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
North American Product Classification System (NAPCS)	index (2013=100)									
Live animal merchant wholesalers (41111)	67.7	96.3	109.7	100.0	96.4	79.8	71.1	63.6	61.2	49.6

Source: Statistics Canada, Wholesale Services Price Index, Table 18-10-0253-01, 2019.

The Retail Services Price Index (RSPI) measures the price movements of services provided by retailers, and provides information on inflation, real output and productivity of the retail sector. The RSPI for the meat markets is not displayed due to confidentiality requirements.

Table 36 presents the average retail estimates of fresh and frozen beef per kilogram from the Retail Commodity Survey (which produces sales estimates of various commodities) and administrative scanner data (Statistics Canada 2020i). In 2019, the average estimates for fresh and frozen beef were highest in Quebec (\$16.83/kg) followed by Alberta (\$15.87/kg). Table 36 also displays estimates for 2020 based on data collected from January to March. The 2020 trends suggest that Quebec (\$17.11/kg) will continue to have the highest sales of fresh and frozen beef, followed by British Columbia (\$16.59/kg).

Table 36
Average retail sales estimates of fresh and frozen beef products, 2019 and 2020

Province	Fresh and frozen beef	
	2019	2020
	dollars per kilogram	
Newfoundland and Labrador	13.57	13.64
Prince Edward Island	13.70	13.58
Nova Scotia	13.47	13.46
New Brunswick	13.56	13.44
Quebec	16.83	17.11
Ontario	14.15	14.83
Manitoba	15.23	15.59
Saskatchewan	14.79	14.99
Alberta	15.87	16.20
British Columbia	15.77	16.59
Canada	14.69	14.94

1. 2020 estimates are only from January to March 2020.

Source: Statistics Canada, Retail Commodity Survey, 2020.

Table 37 displays the average prices of beef products from the Consumer Price Index. Prime rib roast remained the highest priced beef product at \$32.65/kg, while ground beef (\$11.41/kg) had the lowest price. This table illustrates how retail prices of beef products increased from 2010 to 2015, due to the supply and demand factors mentioned above, and then declined or stabilized in the subsequent years.

Table 37
Average retail prices of beef products, 2010 to 2019

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	dollars per kilogram									
Round steak	12.55	13.43	14.13	14.40	16.54	18.86	18.51	17.92	17.82	17.53
Sirloin steak	15.28	16.17	17.29	17.77	20.24	23.60	23.97	22.84	22.47	22.52
Prime rib roast	21.07	22.09	23.40	23.31	26.54	30.04	31.60	31.31	30.61	32.65
Blade roast	10.16	10.65	11.29	12.01	14.16	16.18	16.54	16.19	16.01	15.67
Stewing beef	9.66	10.26	11.05	11.32	14.02	16.71	16.50	16.02	15.50	15.52
Ground beef	7.50	8.21	9.06	9.44	10.94	12.65	12.45	12.24	12.03	11.41

Source: Statistics Canada, Consumer Price Index, Table 18-10-0002-01, 2019.

Table 38 displays the Consumer Price Index of fresh and frozen beef. The CPI represents the change in prices as experienced by Canadian consumers (Statistics Canada 2020c). It is obtained by comparing over time the cost

of a fixed basket of goods and services purchased by consumers. The basket contains goods and services of unchanging or equivalent quantity and quality, thus the index reflects only pure price change.

From 2002 to 2019, the price of fresh and frozen beef increased 84%, which was higher than the 50% increase seen for all food products and the 34% increase seen in the price of a general basket of goods and services. However, since 2010 the price of fresh and frozen beef specifically has only increased 57%.

The Northwest Territories reported a 111% increase in the prices of fresh and frozen beef since 2002, the highest of all the provinces and territories reported. Newfoundland reported the lowest price increase at 64% since 2002.

Table 38
Consumer price index by province/territory, 2010 to 2019

Geography	Products	index (2002=100)										Growth	
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2002-2019	2010-2019
												percent	
Newfoundland and Labrador	All-items	117.4	121.4	123.9	126.0	128.4	129.0	132.5	135.7	137.9	139.3	39	19
	Food	123.6	128.1	132.6	134.5	137.7	142.9	146.4	145.0	145.5	148.2	48	20
	Fresh or frozen beef	119.8	125.6	132.7	126.7	151.3	179.7	183.1	166.3	168.9	164.3	64	37
Prince Edward Island	All-items	119.5	123.0	125.5	128.0	130.1	129.3	130.8	133.2	136.3	137.9	38	15
	Food	126.4	132.0	137.4	138.8	140.8	146.4	150.0	146.8	147.6	152.9	53	21
	Fresh or frozen beef	116.1	123.6	135.1	135.0	163.6	203.6	200.6	179.5	177.0	175.4	75	51
Nova Scotia	All-items	118.2	122.7	125.1	126.6	128.8	129.3	130.9	132.4	135.3	137.5	38	16
	Food	128.2	134.1	137.8	139.6	141.5	147.8	151.4	148.4	148.9	153.0	53	19
	Fresh or frozen beef	117.6	124.7	132.3	135.4	155.5	185.6	186.8	163.8	162.4	168.1	68	43
New Brunswick	All-items	115.9	120.0	122.0	123.0	124.8	125.4	128.2	131.2	134.0	136.3	36	18
	Food	126.9	132.8	137.3	138.5	141.1	147.9	150.6	148.6	150.6	155.6	56	23
	Fresh or frozen beef	116.3	123.8	134.2	134.3	159.5	198.4	200.0	188.4	186.8	189.9	90	63
Quebec	All-items	114.8	118.3	120.8	121.7	123.4	124.7	125.6	126.9	129.0	131.7	32	15
	Food	124.8	129.2	132.4	133.8	136.8	141.7	143.2	143.7	145.1	149.4	49	20
	Fresh or frozen beef	120.5	129.5	138.4	142.6	161.6	186.9	183.5	182.3	183.5	184.3	84	53
Ontario	All-items	116.5	120.1	121.8	123.0	125.9	127.4	129.7	131.9	135.0	137.5	38	18
	Food	123.2	128.1	131.0	132.9	136.2	141.2	143.5	143.3	147.4	152.6	53	24
	Fresh or frozen beef	120.1	124.6	133.2	139.6	159.1	179.1	179.1	177.4	178.8	184.6	85	54
Manitoba	All-items	115.0	118.4	120.3	123.0	125.3	126.8	128.4	130.5	133.8	136.8	37	19
	Food	122.5	127.0	129.8	133.1	136.7	141.3	141.7	141.6	143.8	148.0	48	21
	Fresh or frozen beef	114.5	130.4	147.0	149.3	165.4	191.7	186.4	177.4	180.5	190.0	90	66
Saskatchewan	All-items	118.7	122.0	123.9	125.7	128.7	130.8	132.2	134.4	137.5	139.9	40	18
	Food	123.1	128.2	131.2	134.0	138.1	143.4	144.5	146.1	147.1	151.8	52	23
	Fresh or frozen beef	117.3	136.0	151.0	155.0	180.2	209.5	191.9	188.1	181.6	189.1	89	61
Alberta	All-items	122.7	125.7	127.1	128.9	132.2	133.7	135.2	137.3	140.6	143.1	43	17
	Food	121.8	125.6	128.1	130.8	134.6	139.6	141.5	141.7	143.9	149.2	49	22
	Fresh or frozen beef	112.4	127.0	140.8	144.3	161.0	187.4	181.0	175.9	176.6	188.0	88	67
British Columbia	All-items	113.8	116.5	117.8	117.7	118.9	120.2	122.4	125.0	128.4	131.4	31	15
	Food	119.6	124.6	127.3	127.4	129.5	134.5	136.9	137.7	140.1	145.6	46	22
	Fresh or frozen beef	107.0	118.6	125.7	125.9	142.1	163.7	165.0	162.8	166.0	177.8	78	66
Whitehorse, Yukon	All-items	114.7	118.1	120.8	122.8	124.4	124.1	125.4	127.5	130.6	133.2	33	16
	Food	117.2	120.2	123.3	125.4	129.4	132.3	133.3	132.5	131.5	134.1	34	14
	Fresh or frozen beef	102.0	105.6	115.4	120.1	141.9	160.7	164.2	162.7	160.7	172.1	72	69
Yellowknife, Northwest Territories	All-items	117.9	121.6	124.3	126.2	128.4	130.4	131.9	133.5	136.6	138.8	39	18
	Food	119.8	122.9	124.4	128.1	131.6	138.6	142.6	142.6	142.5	146.1	46	22
	Fresh or frozen beef	105.5	112.8	120.5	128.2	145.3	183.2	196.2	207.6	198.2	211.1	111	100
Canada	All-items	116.5	119.9	121.7	122.8	125.2	126.6	128.4	130.4	133.4	136.0	36	17
	Food	123.1	127.7	130.8	132.4	135.5	140.5	142.6	142.7	145.3	150.2	50	22
	Fresh or frozen beef	117.6	125.9	135.4	139.3	158.2	182.1	180.1	176.8	178.0	184.3	84	57

Source: Statistics Canada, Consumer Price Index, Table 18-10-0005-01, 2019.

Conclusion

This report used Statistics Canada data to present statistics on the beef supply chain. Data was available on stages of the supply chain relating to production, processing, distribution, as well as on interprovincial and international trade.

In terms of beef production, Alberta and Saskatchewan reported the largest number of beef cows, based on the 2016 Census of Agriculture. Beef and feedlot industries made up 10% of all agricultural operations with at least one employee in 2018, and 14,267 employees reported working in beef and feedlot industries. Approximately 3% of temporary foreign workers in agricultural industries reported working in cattle and ranch farming (1,548) in 2018, and 501 agricultural operations with at least one temporary foreign worker reported some cattle and ranch farming.

With regards to financial structure, beef cattle ranchers and farmers' net worth increased 25% from 2013 to 2017, and their net cash farm income increased by 31%. Their operating revenues derived from cattle products decreased 5% from 2015 to 2018, while their operating expenses remained relatively stable from 2015-2018. Beef cattle ranchers and farmer's operating revenues totalled \$13.3 billion in 2018, of which 65% were derived from livestock expenses. Beef cattle ranchers and farmers' farm net operating income (operating revenue – operating expenses) decreased 50% from 2015 to 2018. Alberta reported the highest average revenue (\$3.0 million) and expenses (\$2.9 million) in 2018 in the beef cattle ranching and farming industry.

In the meat processing sector, in 2018, 3.2 million cattle were slaughtered and the average price of cattle for slaughter was \$24.13/kg.

In terms of trade, on an annual basis, the quantity (42%) and value (59%) of livestock imports to Canada increased during the 2010-2019 period. Fresh and chilled beef was the product most imported to Canada, and exported from Canada, as well as the product whose value was the highest. From 2010 to 2019, however, stocks of fresh and chilled beef imports decreased 23%, while fresh and chilled beef exports decreased 4%. The quantity (289%) and value (247%) of cured meat imports to Canada increased substantially from 2010 to 2019.

In terms of exports from Canada, the value of fresh and chilled beef (112%), frozen beef (172%) and edible offal (136%) all increased significantly from 2010 to 2019. Road transportation was used for the majority of imports and exports of livestock and beef products. The US was Canada's major trading partner for imports and exports.

Price indices were also included to provide information on the prices observed at different stages of the supply chain. The Raw Materials Price Index for cattle and calves increased 51% from 2010 to 2019, while the Industrial Product Price Index of fresh and frozen cut of beef increased 41% and fresh and frozen ground beef increased 93% during the same period. The Wholesale Services Price Index for live animal merchant wholesalers decreased by 50% from 2013 to 2019. The Consumer Price Index of fresh and frozen beef increased 57% from 2010 to 2019.

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