

MANITOBA ANALYTICS

Economic Contribution of the Agriculture and Agri-food Processing Sector in Manitoba



1. Introduction

The agriculture and agri-food processing sector in Manitoba is a complex supply chain that includes agricultural producers, agri-food processors, and input and service providers. Development within the primary agriculture sector impacts the performance of all sectors along the supply chain, such as farm inputs, agri-food processing, and supporting services. Farm input suppliers and service providers play an important role as access to affordable inputs and services are key for the profitability and competitiveness of the agriculture sector. The food and beverage processing industry plays a crucial role in transforming primary agricultural commodities into value-added products. The agriculture and agri-food processing sector source most of its inputs from within Manitoba and provide inputs to several other local industries, which makes its total economic impact much larger than the direct economic contribution of the sectors that are directly associated with growing and processing food.

The aim of this report is to estimate the total economic contribution of the agriculture and agri-food processing sector in Manitoba. The most recent economic multipliers released by Statistics Canada were used to estimate the total (direct, indirect, induced) impacts of the agriculture and agri-food processing sector on output, gross domestic product (GDP), employment, and labour income.

The remainder of this report is structured as follows: Section two provides trends on the number of farms, farm size, farmland values, land under major crop production, yield growth, and the number of livestock on farms. Section three briefly highlights the agri-food processing sector. Section four presents the economic contribution of the agriculture and agri-food processing sector in Manitoba. Section five provides some background about economic impact analysis and the results of the estimated economic impacts of the agriculture and agri-food sector. Section six concludes the report.

2. Primary Agriculture

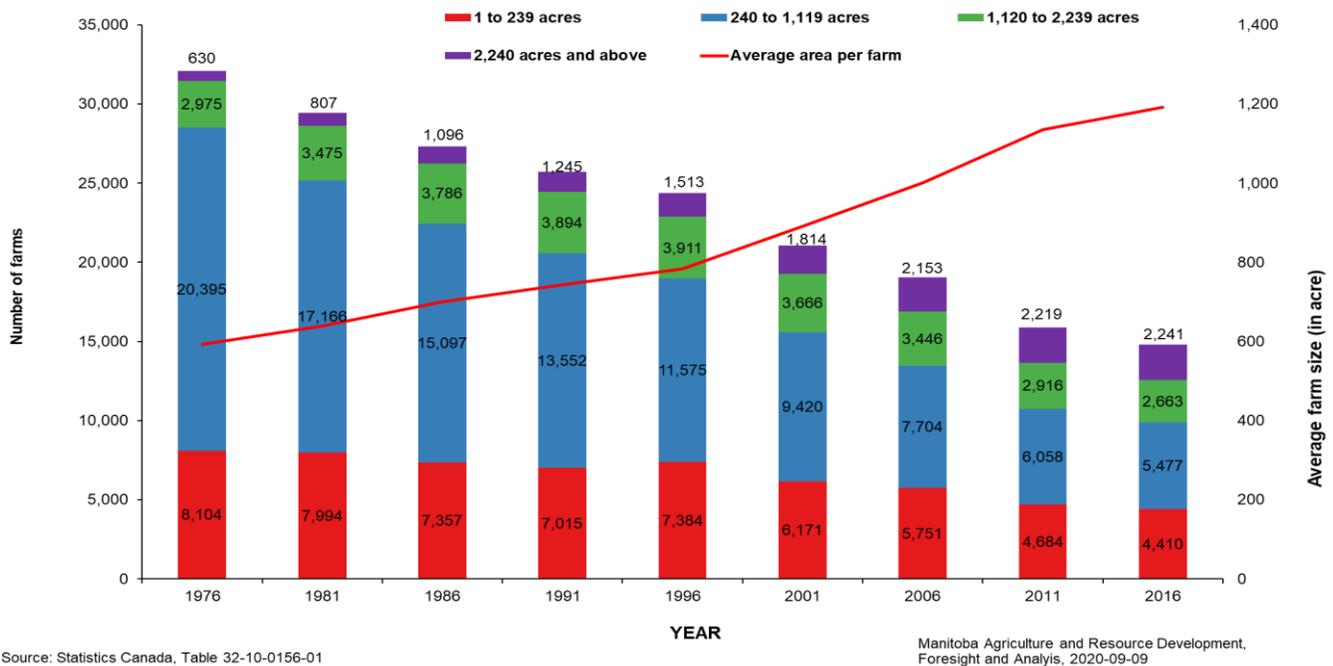
2.1 Number of farms, farm size and agricultural land use

The total agricultural land area in Manitoba in 2016 was 17.6 million acres, representing 13 per cent of total Manitoba land base. Manitoba accounts for 11 per cent of the national total agricultural land area. While the number of farms has declined, the average area per farm is getting bigger over time. The number of farms in Manitoba decreased by 58 per cent from 34,981 farms in 1971 to 14,791 farms in 2016. During the same time, the average farm size increased by 120 per cent from 543 acres in 1971 to 1,192 in 2016.

Because of farm concentration, agricultural production has shifted to larger farms over the last four decades. Although the percentage of small farms remained relatively stable over the last four decades, there is a large decrease in the percentage of medium-sized farms. On the other hand, the proportion of larger farms has significantly increased. The percentage of farms that owned less than 240 acres slightly increased, from 25.2 per cent in 1976 to 29.8 per cent in 2016. The percentage of farms that owned between 240 and 1,119 acres decreased nearly by half, from 63.7 per cent in 1976 to 37 per cent in 2016. But, the percentage of farms that own more than 1,120 acres tripled, from 11.2 per cent in 1976 to 33.3 per cent in 2016.

The number of farms that own more than 2,240 acres increased by 255 per cent, from 630 farms in 1976 to 2,241 farms in 2016. In other words, the percentage of farms that own 2,240 acres and above increased, from 1.8 per cent in 1976 to 15.2 per cent in 2016. Figure 1 provides the trend in average farm size and the number of farms based on farm size category.

Figure 1. Trends in average farm size and number of farms by farm size categories.



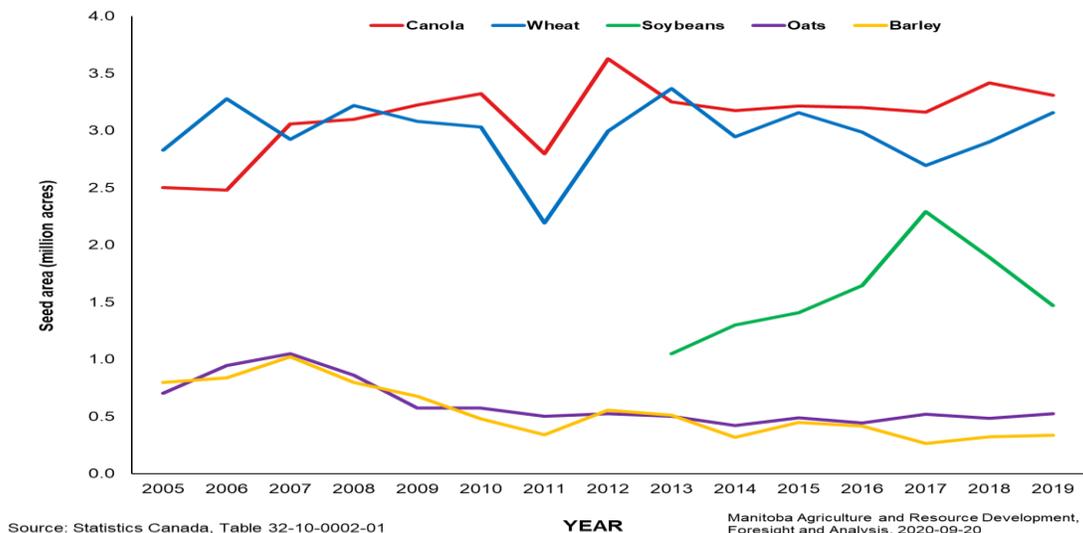
2.2 Area under crop production

In 2019, the top five crops (canola, wheat, soybean, oats, and barley) accounted for about 97.5 per cent of the land under all crops in Manitoba. The area under crops fluctuated from year to year, depending on the market and growing conditions. Overall, the areas under canola and wheat are showing upward trends over the years. In 2007, for the first time, canola overtook wheat as the largest crop in Manitoba. The area under canola production increased by 32 per cent from 2.5 million acres in 2005 to 3.3 million acres in 2019, or a compound annual growth rate (CAGR) of two per cent. Similarly, between 2005 and 2019, the area under wheat production increased by 11.6 per cent, or annually by a CARG of one per cent.

On the other hand, over the last 15 years, the areas under barley and oats have been showing downward trends. The area under barley production decreased by 58 per cent from 800,000 acres in 2005 to 336,300 acres in 2019 or a decline of six per cent per year. The area under oats decreased by 25.5 per cent from 705,000 acres to 525,000 acres, or a decrease of two per cent per year.

The area under soybean, a relatively new crop to Manitoba, showed a 6 per cent CAGR between 2013 and 2019. However, the area under soybean significantly declined in 2018 and 2019. In 2019, the soybean acres decreased by 22 per cent, from 1.9 million acres in 2018 to 1.5 million acres in 2019. Poor soybean yields, due to the dry summer conditions and lack of rain, were the main reasons for the sharp decline in soybean production. Figure 2 shows the trend in acres under the top five crops between 2005 and 2019.

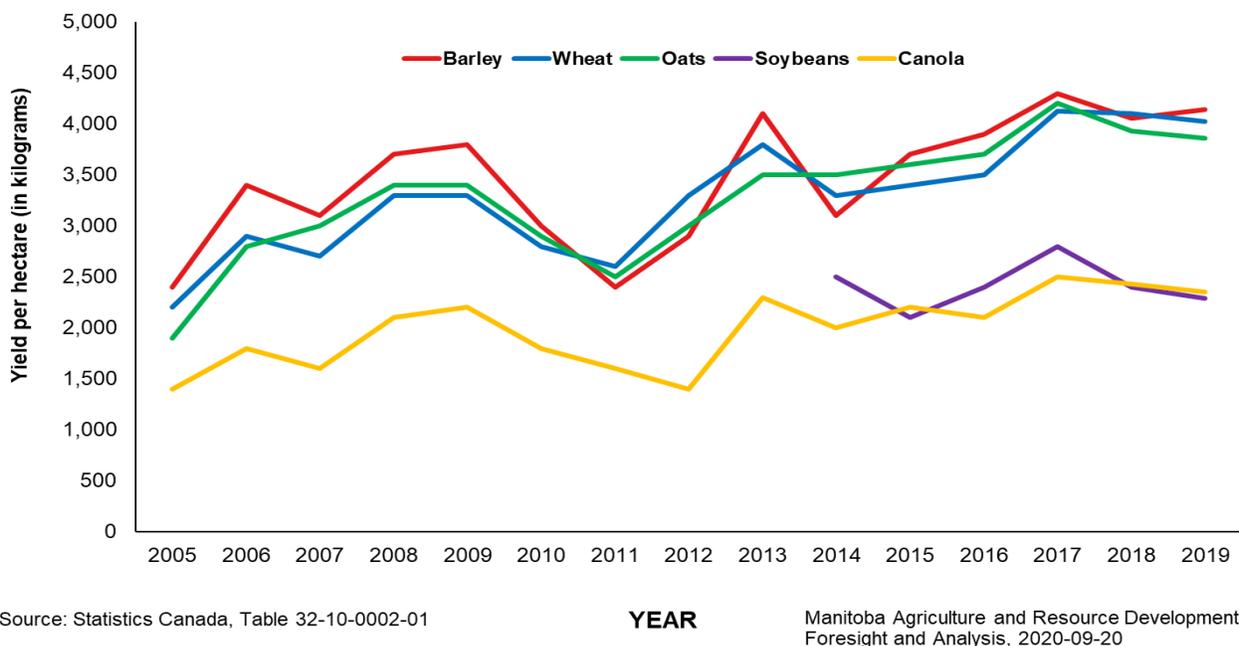
Figure 2. Seeded area of the top five field crops in Manitoba



2.3 Crop yield

Although there are year-over-year variations, overall, the average yield per acre for the main crops has shown a significant improvement over the last 15 years. Between 2005 and 2019, the average canola yield per hectare increased by 68.1 per cent, or annually by four per cent. During the same time, wheat and barley yield increased by 82.8 per cent and 72.5 per cent, or by four per cent CAGR, respectively. Oat yield showed the largest percentage increase of 103.2 per cent or five per cent annual growth rate since 2005. As dry summer conditions over the last few years led to a poor soybean yield performance, soybean yield decreased by 8.5 per cent in 2019 compared to the yield level in 2014. Investments in crop breeding, agronomic research, and improved crop management practices are the main drivers of crop yield growth. Year-over-year fluctuations in crop yield are mainly caused by weather variabilities, mainly drought, excessive moisture during planting and harvesting times, frostbite, and other environmental conditions.

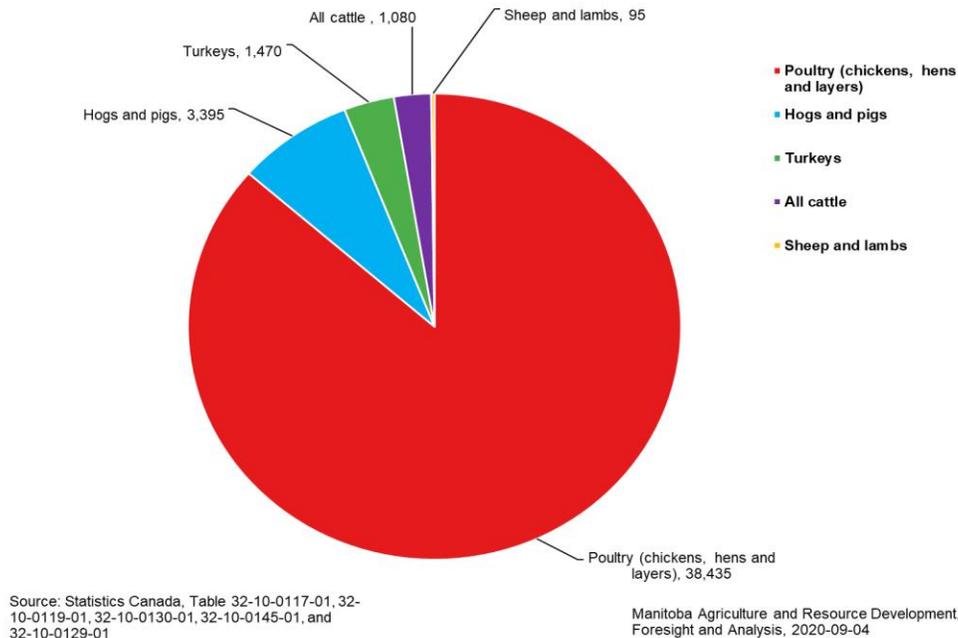
Figure 3. Trends in yield per acre of the top five crops in Manitoba



2.4 Number of livestock on farms

On July 1, 2019, there were 3.4 million pigs and hogs, 1.1 million cattle, 38.4 million poultry, 1.5 million turkeys, and 95,000 sheep and lambs on Manitoba farms. In 2019, Manitoba accounted for about 24 per cent of the total number of pigs and hogs on-farm in Canada, making it the third-largest pig-producing province in Canada. Since 2010, the number of pigs and hogs on-farm increased by 20.6 per cent or by 2.1 per cent CAGR. The number of poultry (chicken, hens, layers) have increased by 17.7 per cent, or by 1.8 per cent CAGR. Between 2010 and 2019, the number of cattle and turkeys on farms declined by 18.8 per cent and 1.2 per cent, respectively.

Figure 4. Number of livestock on farms in Manitoba (Thousand animals/birds) July 1, 2019.



3. Agri-food Processing

The agri-food processing industry is the largest manufacturing industry in Manitoba in terms of the value of sales (shipments), accounting for 26 per cent of Manitoba's total manufacturing sales in 2019. Manitoba has about 620 food and beverage processing establishments in 2019, of which 385 were provincially registered under Manitoba Agriculture and Resource Development. About 235 facilities are federally-inspected.

It is estimated that about 99% of Manitoba's food and beverage manufacturing businesses are small and medium enterprises (SMEs): 20% micro (less than five employees), 72% small (5-100 employees), 7% medium (101-499 employees), and 1% large (500 and more employees).

The three largest food processing industries in Manitoba are meat product manufacturing, grain and oilseed milling, and dairy product manufacturing. Manitoba has developed a Protein Advantage Strategy for the sustainable protein production, processing and innovation, with the aim of making Manitoba one of the top suppliers of protein in North America. There is an increasing global demand for plant-based protein, organic, and other health foods. The global market for plant-based protein alone is estimated to reach USD \$14.5 billion by 2025 from the current level of \$10.3 billion. The increasing demand for sustainable protein and other health foods provides huge growth opportunities for Manitoba's food and beverage processing industry.

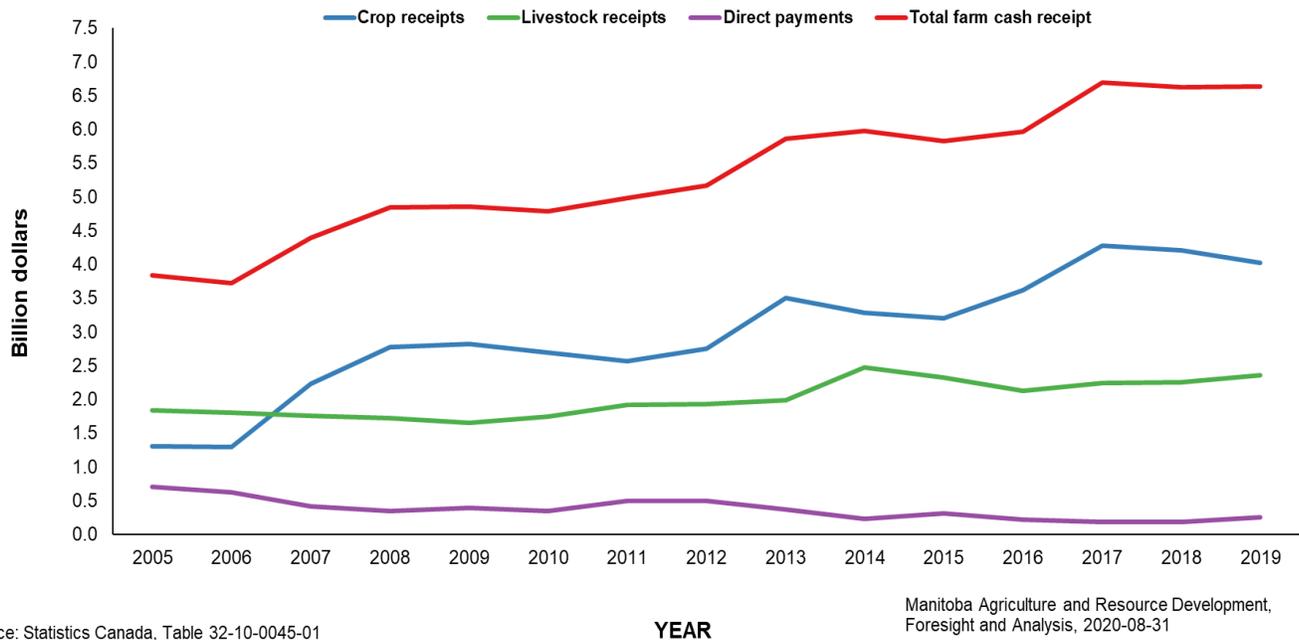
4. Economic Contribution of the Agriculture and Agri-Food Processing Sector

4.1 Output

4.1.1 Farm Cash Receipts

Manitoba's total farm cash receipts in 2019 were \$6.6 billion, slightly higher than the record level set in 2018. Crop cash receipts in 2019 were \$4.02 billion, which is 4.4 per cent lower than in 2018. Between 2005 and 2019, crop receipts increased by 210 per cent or by 8 per cent CAGR. Livestock receipts in 2019 were \$2.4 billion, five per cent higher than the level in 2018. Livestock receipts increased by 28.7 per cent, or by 1.8 per cent CAGR from 2005 to 2019. Direct payments increased by 41.7 per cent from \$180 million in 2018 to \$255 million in 2019. But, between 2005 and 2019, direct payments decreased by 63.6 per cent, or by 7 per cent CAGR. Crops accounted for 60.6 per cent of the total farm cash receipts in 2019. With a \$1.31 billion farm cash receipt or 20.3 per cent of the total farm cash receipts, canola was Manitoba's top-earning commodity in 2019, followed by wheat and hogs, which generated \$1.13 billion and \$1.09 billion, respectively.

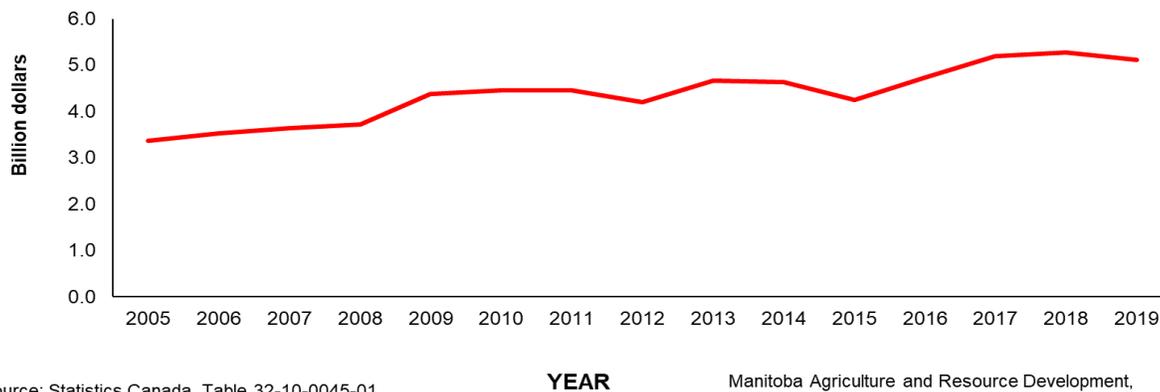
Figure 5. Trends in farm cash receipts, 2005-2019



4.1.2. Food Processing Sales

In 2019, the total food manufacturing sales was \$5 billion, 1.1 per cent lower than the sales level in 2018. The food manufacturing sector accounted for 26 per cent of the total manufacturing sales in 2019. Between 2005 and 2019, the food manufacturing sales increased by 48 per cent, or by 2.8 per cent CAGR. Meat product manufacturing is the largest food manufacturing sector in Manitoba. In 2019, meat product manufacturing generated \$2.2 billion in sales, slightly short of the record level in 2018. In the same year, meat product manufacturing accounted for 43.3 per cent of the total food manufacturing sales. Grain and oilseed milling is the second largest food manufacturing in Manitoba with \$950 million in 2019, 4.4 per cent lower than the sales level in 2019. Grain and oilseed milling accounted for 19.1 per cent of the total food manufacturing sales in 2019. Dairy product manufacturing ranked as the third-largest food manufacturing, with sale of values of \$754 million in 2019, slightly higher than in 2018.

Figure 6. Trends in agri-food processing sales in Manitoba, 2005-2019



Source: Statistics Canada, Table 32-10-0045-01

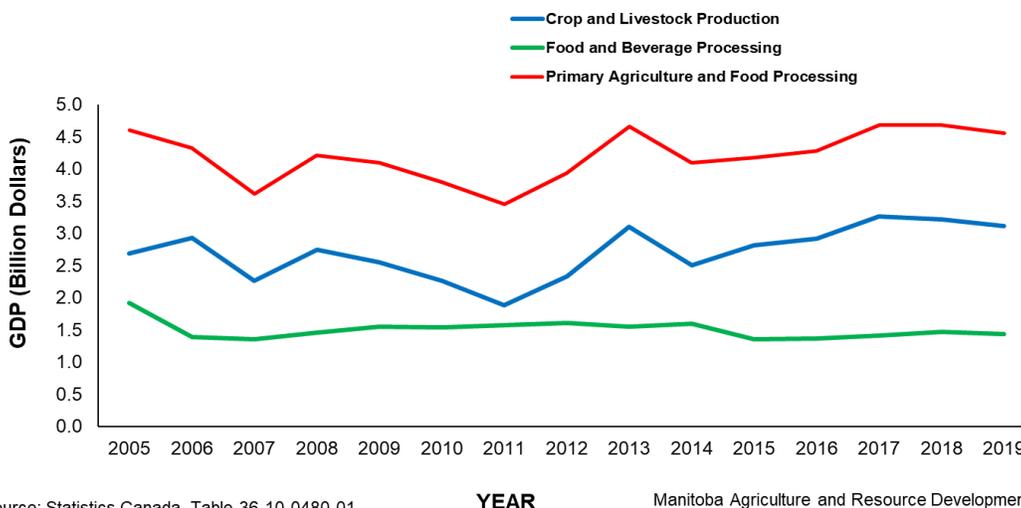
Manitoba Agriculture and Resource Development, Foresight and Analysis, 2020-12-11

4.2 Gross domestic product (GDP)

Manitoba’s total GDP was estimated to be \$63.5 billion in 2019, up by one per cent from \$62.9 billion in 2018. Primary agriculture (crop and animal production, including support services for crop and animal production) contributed \$3.1 billion (five per cent) to the provincial GDP in 2019, which ranks the sector as the 10th largest sector of the 19 sectors in Manitoba. With a \$1.3 billion value-added, the agri-food processing sector accounted for 2 per cent of the provincial GDP and 21.7 per cent of the total manufacturing value added in 2019. Primary agriculture (including support services) and agri-food processing together constitute about 7 per cent of the provincial GDP, which ranks as the 6th most important sector in Manitoba. The crop and animal production sector’s GDP declined by about 2.8 per cent in 2019 compared to the previous year. The agri-food processing sector’s GDP also decreased by 3 per cent in 2019 compared to 2018.

Over the last 15 years, the share of crop and animal production in the provincial GDP ranged between 3.5 per cent and 5.6 per cent. Between 2005 and 2019, the lowest GDP share for the crop and animal production sector was registered in 2011 when a large portion of Manitoba’s farmland was taken out of production due to flooding. The highest GDP share of the crop and animal production sector was registered in 2013, which was the year Manitoba farms obtained a record high net farm income. Similarly, over the last 15 years, the agri-food processing sector’s GDP share in the provincial economy ranged between 2.1 per cent and 3 per cent. During the same time, the contribution of primary agriculture and food-processing to the provincial GDP ranged between 6.3 per cent and 8 per cent.

Figure 7. Trends in the provincial GDP share of the primary agriculture and agri-food sector, 2005-2019



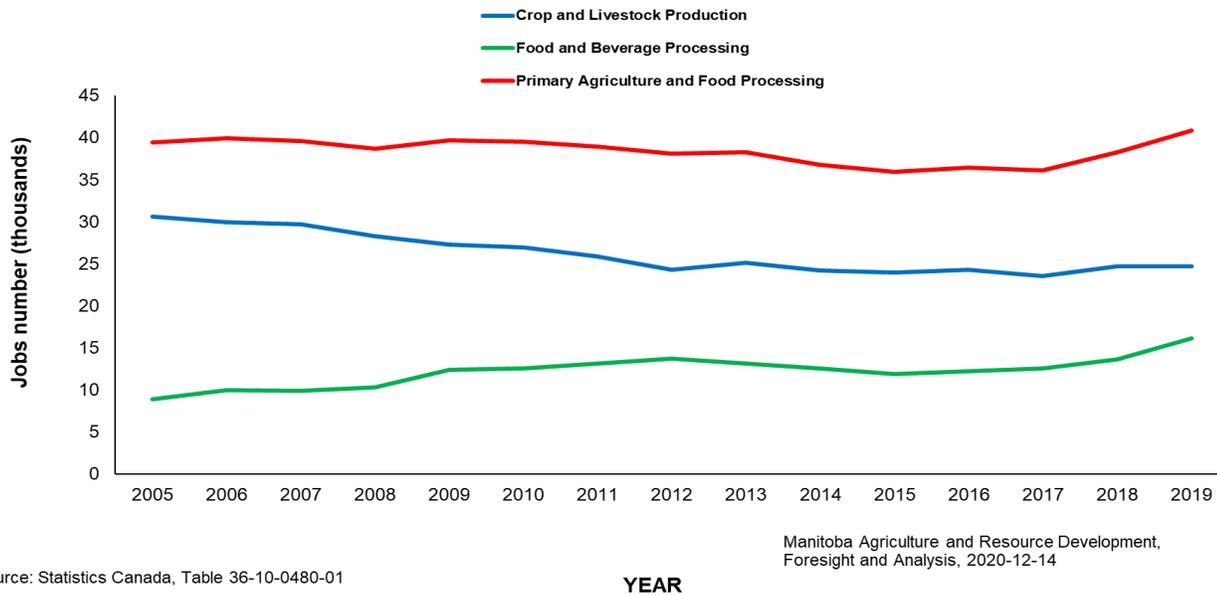
Source: Statistics Canada, Table 36-10-0480-01

Manitoba Agriculture and Resource Development, Foresight and Analysis, 2020-12-11

4.3 Employment

The primary agriculture and agri-food processing sector creates significant job opportunities for Manitobans. In 2019, the primary agriculture industry (including support activities) employed 24,735 Manitobans, while the agri-food processing industry created direct employment opportunities for 16,095 employees. The employment in the food and beverage manufacturing sector accounts for 20 per cent of the total employment in the manufacturing sector. With the total of 40,830 jobs, the primary agriculture and agri-food processing sectors account for 5.9 per cent of the 689,335 jobs in all industries in Manitoba. Since 2005, the number of jobs in the primary agriculture has declined by about 19 per cent. This is mainly linked to the decreasing number of farms and the adoption of labour-saving technologies in Manitoba. During the same period, the number of farms in Manitoba has declined by 22 per cent. On the other hand, the number of jobs in the food and beverage manufacturing sector has increased by 81.6 per cent from 8,865 jobs in 2005 to 16,095 jobs in 2019.

Figure 8. Trends in employment number in the primary agriculture and agri-food sector, 2005-2019



5. Economic Impact Analysis

Using the direct economic contributions resented above, this section provides estimates of the total economic impacts of the agriculture and agri-food processing sector in Manitoba.

5.1 Key economic impact concepts

An economic impact analysis estimates the changes in economic activity (e.g., changes in sales, labour income, employment) within a region resulting from some economic actions (e.g., opening of a new factory, increase in export demand, closing of an existing food processing facility, increase in government expenditure). Three types of economic impacts can be estimated – direct, indirect, and induced.

The direct impacts are the changes in local business activities occurring as a direct consequence of public or private business decisions, or public policies and programs. Direct impacts takes place only for the industry immediately affected. For agrifood sector, for instance, the direct impact capture the total output from this sector. These direct impacts become the starting point for a serious of other impacts within the economy.

Indirect impacts occur, for example, when the farm industry purchases various goods and services (e.g., fertilizer, pesticides, farm machinery, etc.) from other industries within the economy to produce its outputs. When the farm sector purchases goods and services from suppliers within the region, in turn, these local suppliers generate further demand for additional goods and services within the economy.

Finally, induced impact captures the impacts when farm households and employees spend some of their income on food, clothing, shelter and other consumer goods and services within the region.

5.2 Economic multipliers

Economic multipliers provide a measure of the interdependence between a given industry and the rest of the economy. The size of economic multipliers varies by the size of economic activity and interaction of industries within the area. The more inputs purchased locally and the more consumer spends at the local shops, the higher the value of the economic multiplier. Similarly, the larger the area under consideration, the more economic activity will likely occur within the area that will result in higher economic multipliers.

There are two main types of economic multipliers generated by Statistics Canada: Type I (open model), which is where the total impacts include only direct and indirect impacts or Type II (closed model), which is where the total impacts include direct, indirect, and induced impacts. Type II multipliers are used to generate the economic impacts presented below¹. Studies indicate that Type I impacts may lead to underestimation of total impacts, whereas Type II impacts may lead to overestimation. Thus, Type I and Type II impacts can be considered as the lower and upper bound of the estimated total impacts.

5.3 Economic impacts of the Manitoba's agriculture and agri-food processing sector

5.3.1 Primary Agriculture and Agri-food Processing

This section presents the total economic contributions of the primary agriculture and agri-food processing sector to Manitoba's economy. In 2019, Manitoba's agriculture and agri-food processing sector generated \$11.5 billion in direct sales and contributed \$4.5 billion to the provincial GDP, which includes \$1.7 billion in labour income. The sector created 40,830 direct job opportunities for Manitobans.

Table 1 below provides a summary of the direct, indirect, and induced impacts of the agriculture and agri-food processing sector in Manitoba. The total impacts of the agriculture and food and agri-food processing sector in 2019 was estimated to be \$18 billion in sales (farm cash receipts and manufacturing sales), \$9 billion in value-added (including close to \$4 billion in labour income) and just over 105,000 jobs.

The total output multiplier of 1.60 indicates that every \$1 output produced by the agriculture and agri-food processing sector leads to an additional \$0.60 output elsewhere within the provincial economy. The total value-added multiplier was 2.05, meaning every \$1 of GDP generated by the agriculture and agri-food processing sector in 2019 created an additional \$1.05 in value-added elsewhere within the provincial economy.

The income multiplier for the agriculture and agri-food processing sector was 2.34, which indicates for every \$1 income earned by the employee in the agriculture and agri-food processing sector in 2019, an additional \$1.34 was earned by employees elsewhere within the provincial economy. With a 2.56 total employment multiplier, every direct job created by the agriculture and agri-food processing sector resulted in an additional 1.56 jobs elsewhere within the economy.

Table 1: Economic contribution of the primary agriculture and agri-food processing sector in Manitoba in 2019

| Type of Impact | Output (sales) (\$ million) | GDP (\$ million) | Labour Income (\$ million) | Employment (jobs) |
|----------------|--------------------------------|---------------------|-------------------------------|----------------------|
| Direct | 11,497 | 4,475 | 1,684 | 40,830 |
| Indirect | 5,668 | 3,705 | 1,820 | 51,201 |
| Induced | 1,184 | 998 | 443 | 13,147 |
| Total | 18,349 | 9,178 | 3,947 | 105,178 |

Source: Statistics Canada

Manitoba Agriculture and Resource Development, Foresight and Analysis

¹ Statistics Canada generates economic multipliers only at the industry level. Multiplier weights were purchased from Statistics Canada to generate sector level economic multipliers, e.g. aggregate multipliers for crop and livestock sector. Industry level multipliers can be obtained from Statistics Canada, Table 36-10-0595-01.

5.3.2 Crop and Animal Production

The direct economic contribution of the crop and animal production sector in 2019 was \$6.4 billion (excluding direct payments) in farm cash receipts and \$3.1 billion in GDP, including over \$770 million in labour income. These sectors also created 24,735 job opportunities in the province. When the indirect and induced impacts are considered, the total economic impact of the crop and animal production sector in 2019 was estimated to be \$9.2 billion in total output and \$5.1 billion in GDP, including \$1.8 billion in labour income. Every \$1 output, produced by the crop and animal production sector at the farm level, led to an additional \$0.44 output elsewhere within the provincial economy. For every \$1 of GDP generated by the crop and animal production sector, an additional \$0.63 value-added was created elsewhere in the provincial economy. Similarly, for every \$1 income earned by the crop and animal production sector employees, another \$1.35 was earned by employees of other industries within the economy.

With a total employment multiplier of 1.89, the total employment impact of the crop and animal production sub-sector (including the support services for crop and animal production) was estimated to be 46,799 jobs. For every direct job created by the crop and animal production sector, an additional 0.89 jobs were created elsewhere in the economy.

Table 2: Economic contribution of Manitoba's crop and livestock production (including support services) in 2019

| Type of Impact | Output (sales) (\$ million) | GDP (\$ million) | Labour Income (\$ million) | Employment (jobs) |
|----------------|--------------------------------|---------------------|-------------------------------|----------------------|
| Direct | 6,380 | 3,117 | 771 | 24,735 |
| Indirect | 2,316 | 1,555 | 854 | 17,216 |
| Induced | 479 | 396 | 201 | 4,848 |
| Total | 9,175 | 5,067 | 1,826 | 46,799 |

Source: Statistics Canada

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5.3.3 Crop Production

In 2019, the direct farm cash receipts from the crop sector was \$4.0 billion (excluding direct payments) making crop production one of the most important economic sub-sectors in the province. The sector also generated \$2.4 billion in value-added, including \$425 million in labour income, while creating 11,405 job opportunities.

With the total output multiplier of 1.37, the total economic impact of the crop sub-sector was estimated to be \$5.5 billion. This indicates that for every \$1 direct output generated by the crop sub-sector, an additional \$0.37 output was generated by other industries within the provincial economy.

The total value-added impact of the crop sub-sector was estimated to be \$3.4 billion (including more than \$1 billion in labour income). Every \$1 value-added generated by the crop sub-sector creates an additional \$0.43 value-added by other industries within the Manitoba economy. The crop production sub-sector has an income multiplier of 2.36, which indicates that every \$1 income earned by employees within the crop sub-sector generates an additional \$1.36 in labour income for employees in other industries. With an employment multiplier of 1.95, the total employment impact of the crop sector was 22,194 jobs. For every direct job created in the crop sector an additional 0.95 jobs were created throughout the economy.

Table 3: Economic contribution of crop production in Manitoba in 2019

| Type of Impact | Output (sales) (\$ million) | GDP (\$ million) | Labour Income (\$ million) | Employment (jobs) |
|----------------|--------------------------------|---------------------|-------------------------------|----------------------|
| Direct | 3,992 | 2,391 | 425 | 11,405 |
| Indirect | 1,198 | 743 | 466 | 8,371 |
| Induced | 279 | 220 | 113 | 2,418 |
| Total | 5,469 | 3,354 | 1,005 | 22,194 |

Source: Statistics Canada

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5.3.4 Animal Production

Animal production is an important farm sub-sector in Manitoba. The animal production sub-sector in Manitoba include swine, beef and dairy cows, chicken, eggs, turkey, and sheep. In 2019, the animal production sub-sector generated more than \$2.4 billion in direct farm sales/farm cash receipts where hogs, cattle, and dairy were the top three contributors to the livestock farm cash receipts. Table 4 provides the direct, indirect, and induced impacts of the animal production sub-sector.

The total economic impact of the animal production sub-sector in 2019 was estimated to be about \$4.2 billion in outputs, \$1.7 billion in value-added, \$642 million in labour income, and 19,148 employment opportunities. The total output multiplier for the animal production sub-sector was 1.75, meaning every dollar direct output generated by the animal production sub-sector stimulated an additional \$0.75 dollar output within the provincial economy. The total value-added multiplier was 2.66 which indicates that every dollar value-added generated by the animal production sub-sector has resulted in an additional \$1.66 value-added within the provincial economy. The total employment multiplier was 1.65, or in other words, 0.65 additional jobs were created for every job created by the animal production sub-sector.

Table 4: Economic contribution of livestock production in Manitoba in 2019

| Type of Impact | Output (sales) (\$ million) | GDP (\$ million) | Labour Income (\$ million) | Employment (jobs) |
|----------------|--------------------------------|---------------------|-------------------------------|----------------------|
| Direct | 2,388 | 647 | 268 | 11,640 |
| Indirect | 1,564 | 886 | 310 | 6,076 |
| Induced | 236 | 186 | 64 | 1,432 |
| Total | 4,189 | 1,720 | 642 | 19,148 |

Source: Statistics Canada

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5.3.5 Food and Beverage Manufacturing

Food and beverage processing is a key engine of Manitoba's economy and an essential complement of the agri-food sector. With a total direct sale of \$5 billion in 2019, food and beverage manufacturing is the largest manufacturing sector in Manitoba.

Once the indirect and induced impacts are considered, the food and beverage-processing sector contributed nearly \$8.9 billion in total output and \$3.3 billion in value-added, including \$2.1 billion in labour income. Every \$1 direct sales generated by the food and beverage manufacturing industry created an additional \$0.74 elsewhere within the provincial economy. Similarly, for every dollar value-added generated by the food and beverage processing sector, an additional \$1.45 value-added was generated somewhere else within the economy. With a total employment multiplier of 3.22, the food and

beverage-manufacturing sector created 51,745 job opportunities within Manitoba. This means that for every direct job created by the food and beverage manufacturing industry, additional 2.22 jobs were created.

6. Summary

This report discusses the contribution of the agriculture and agri-food processing sector to the Manitoba economy. The most recent economic multipliers were used to estimate the total economic impacts of the agriculture and agri-food processing sector in Manitoba.

The economic impacts of the agriculture and agri-food processing sector in Manitoba extend far beyond the direct contributions of those sectors that are directly associated with growing and processing food. The primary agriculture and agri-food food processing sector sources most of its inputs from within Manitoba and provide inputs to several other local industries, which makes its total economic impact much larger than the direct economic contribution.

In 2019, the primary agriculture and agri-food processing sector generated \$11.5 billion in direct sales and contributed \$4.5 billion to the provincial GDP including \$1.7 billion in labour income. The sector created direct job opportunities for 40,830 Manitobans.

Once the indirect and induced impacts are considered, the total economic impacts of the primary agriculture and agri-food processing sector in Manitoba in 2019 was estimated to be \$18.3 billion in total output, \$9.2 billion in GDP (including nearly \$4 billion in labour income) and 105,178 jobs.

Currently, Manitoba exports large volumes of unprocessed primary agricultural commodities. Adding value to these primary commodities locally would further strengthen the economic impacts of the primary agriculture and food manufacturing sector in Manitoba. When foods are locally produced and processed, more money will stay in the province, yielding larger economic multipliers and larger overall economic impacts.

The strong demand for agricultural commodities at the global markets provides a great opportunity for Manitoba producers to increase their production level and further contribute to the economic growth of the sector.

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