Economic Impact of Agriculture in Lethbridge County

Prepared For

Lethbridge County

Prepared By

Serecon Inc.

Edmonton, Alberta

October 2020

October 9, 2020

Martin Ebel
Economic Development Officer
Lethbridge County
#100 – 905 – 4th Avenue South
Lethbridge, AB
T1J 4E4

Dear Mr. Ebel:

RE: EVALUATION OF THE ECONOMIC IMPACT OF AGRICULTURE IN LETHBRIDGE COUNTY

Please find attached the final report outlining our findings on the impact of agriculture in Lethbridge County. It has been a pleasure conducting this interesting study on behalf of the County.

Yours truly,
Serecon SERVICES INC.

Markus Weber

Enclosure

Table of Contents

Executive Summary / Briefing

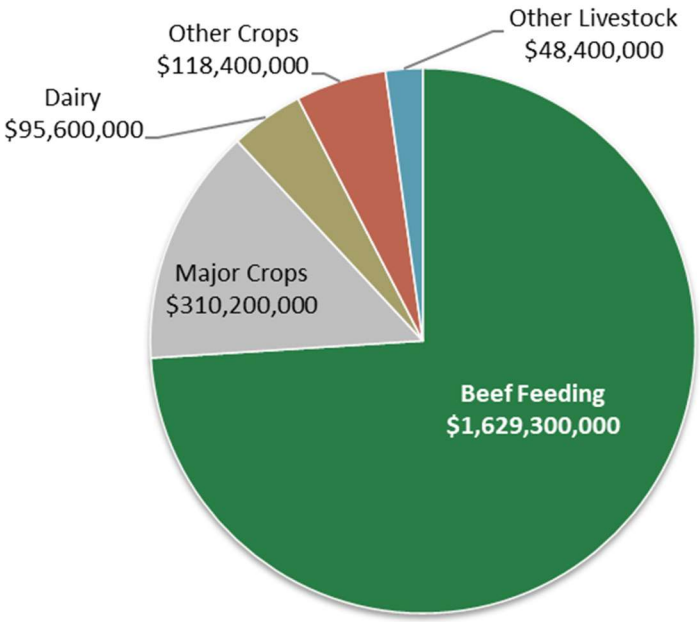
Lethbridge County is the only County in Alberta that generates over $2 billion in gross farm receipts and is in a unique situation given its extensive agriculture production, including both the continued improvement of crop production due to central irrigation, as well as the largest concentration of intensive livestock operations in the province. Compared to 2011, farm cash receipts increased 90%, by 2016, illustrating the growing significance of the agriculture sector in Lethbridge County.

This report presents the methodology and results of an updated analysis to estimate the contribution that various agriculture industry sectors in Lethbridge County make to the Alberta economy. The overall impacts include the direct, indirect and induced expenditures by business and people that occur in subsequent rounds of spending. The primary data source for livestock inventories and crop acreages was the 2016 Census of Agriculture.

The largest agricultural sectors were examined in this study, including the major field crops and several livestock sectors. Overall, it is estimated that in 2016 the agriculture sector in Lethbridge County made a contribution of $2.2 billion to the economy, for an impact of $728 million on Gross Domestic Product.

It is clear from the analyses in this report that in Lethbridge County several agricultural subsectors are considerably larger than all the others. Bovine sectors and the major field crops represent the largest impact on the Alberta economy. Livestock made the larger contribution at 80% of the total, or $1.8 billion of which $1.6 billion was from beef feeding. In addition, the Lethbridge County crop sector has an economic impact of $432.7 million.

Figure 1: Economic Impact Breakdown for Lethbridge County



Project & County Overview

Background

Lethbridge County is in a unique situation given its extensive agriculture production, comprising of both the acceleration of production due to central irrigation as well as intensive livestock operation. The area boasts the largest concentration of intensive livestock operation's in the province and also contains over 187,000[1] irrigated acres.

Intensive livestock operations in Lethbridge County are a value-creating industry that is continually growing. With this high level of activity comes a large tonnage of grain being moved through the county plus a large amount of manure. This large demand for cattle finishing grains has supported a sub-sector industry of central irrigation which supplies these grains.

Within Lethbridge County there are some 4,825 employed labourers, with over 1,495 (nearly one third) of them being employed in the primary industries, including agriculture.[2] It is evident the effect that farming has on the local economy. Both the ILO's and irrigated farmland contribute to this employment and therefore contribute to the value of the County. The indirect value of these positions created through agriculture is far stretching, as their salaries contribute to the GDP through spending, taxes, investing and a variety of other avenues.

This report presents the methodology and results of an analysis to estimate the contribution that various agriculture industry sectors in Lethbridge County make to the Alberta economy. The overall impacts include the indirect and induced expenditures by business and people that occur in subsequent rounds of spending.

This section of the report provides an overview of agriculture in the County and outlines the methodologies and datasets used, including a discussion on the multipliers employed. The next section will then examine in detail the outcomes of our analyses and estimates of economic impact.

1 https://globalnews.ca/news/6538522/lethbridge-county-irrigation-districts-alliance/
2https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=4802011&Geo2=PR&Code2=48&SearchText=Lethbridge+County&SearchType=Begins&SearchPR=01&B1=Labour&TABID=1&type=0

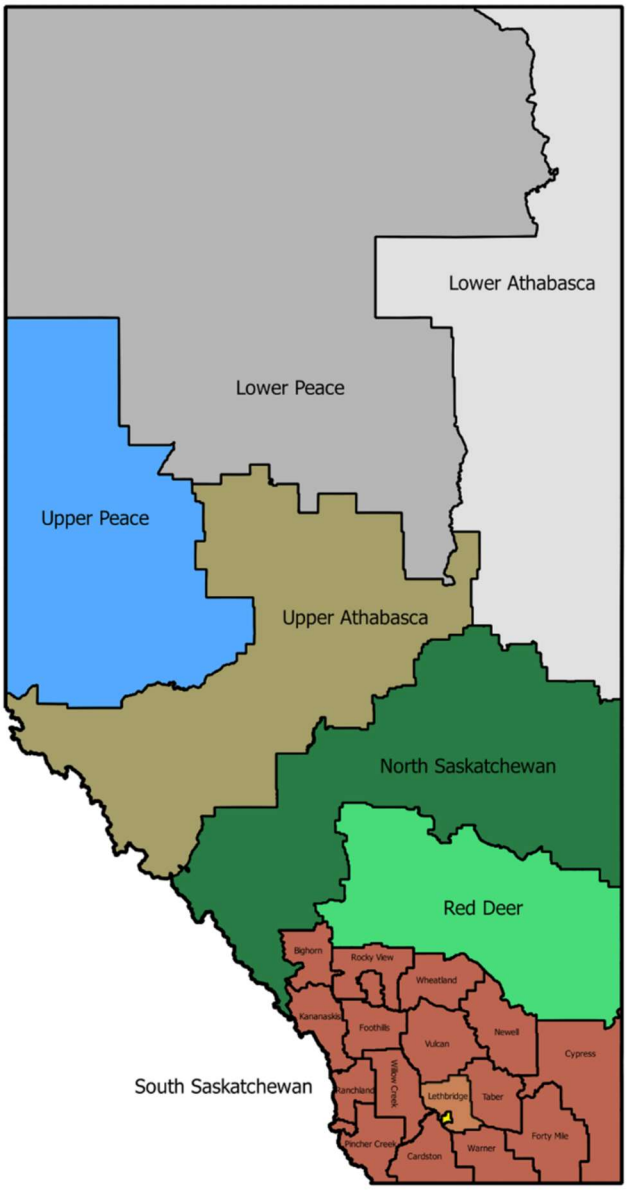
Lethbridge County Agriculture Overview

Lethbridge County is perceived as a hotbed especially for feedlot operations, but more generally for intensive livestock operations. This is borne out by the statistics compiled by Statistics Canada.

Lethbridge County is located in the South Saskatchewan region, which is composed of nineteen separate municipalities all of which have a broad set of similarities in regard to land-use.

Figure 2 on the next page shows the land-use regions and the Counties in the South Saskatchewan LUR.

Figure 2: Alberta Land Use Regions & South Saskatchewan Counties

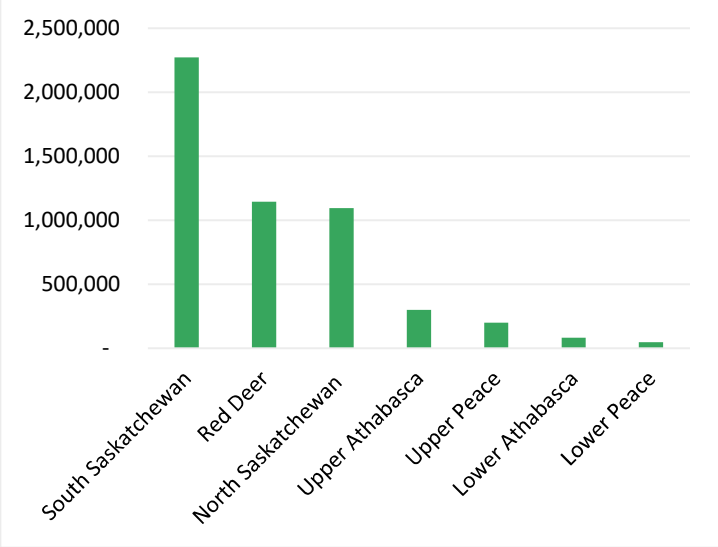


However, even in this grouping where similarities are supposed to exist, there are many exceptions across a number of categories in which data is composed. The South Saskatchewan Region and notably Lethbridge County stand out across a number of data sets having stronger than normal agricultural economic activity in a number of core activities. This indicates that Lethbridge County is the largest municipality in terms of economic activity, in the region of Alberta that is the most active.

Cattle Numbers

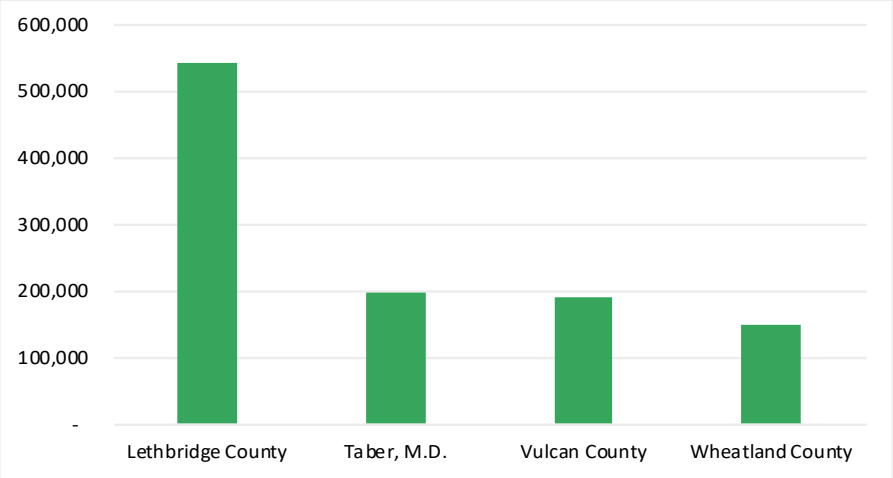
With regard to cattle, the South Saskatchewan Region overall many more animals than any other region in the province. Of the total 5.2 million cattle and calves reported in the province, over 2.3 million of them were reported in the South Saskatchewan region.[3] Of those, the largest proportion was in Lethbridge County. The second closest municipality in the South Saskatchewan Region has less than half as many cattle as Lethbridge County does. The following figures indicate cattle numbers by Land-use Region, followed by a breakdown of that region by municipality.

Figure 3: Cattle and Calves, by Land-use Region



3 https://regionaldashboard.alberta.ca/#/explore-an-indicator?i=total-cattle-and-calves&d=CalculatedValue
Adapted from Statistics Canada 2016 Agricultural Census

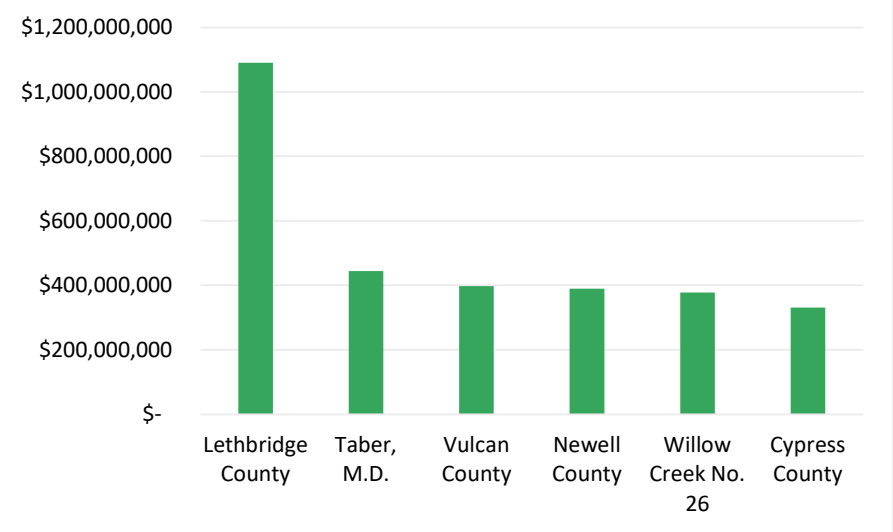
Figure 4: Cattle and Calves in South Saskatchewan Region, by County



Livestock Value

Alberta has a Livestock and Poultry market value of over 11 billion dollars. Of that over 40% resides in the South Saskatchewan Region, being the largest single region in the province. Within that region the largest single Municipality is Lethbridge County, having a financial valuation amount of over $1 billion dollars. The following table reflects the Livestock and Poultry market value of the largest municipalities in the South Saskatchewan Region. The market value of livestock and poultry in Lethbridge County has surged from roughly $358 million in 2011 to $1.1 billion in 2016, increasing over 200%.

**Figure 5: Livestock and Poultry Market Value
South Saskatchewan Region, by County**



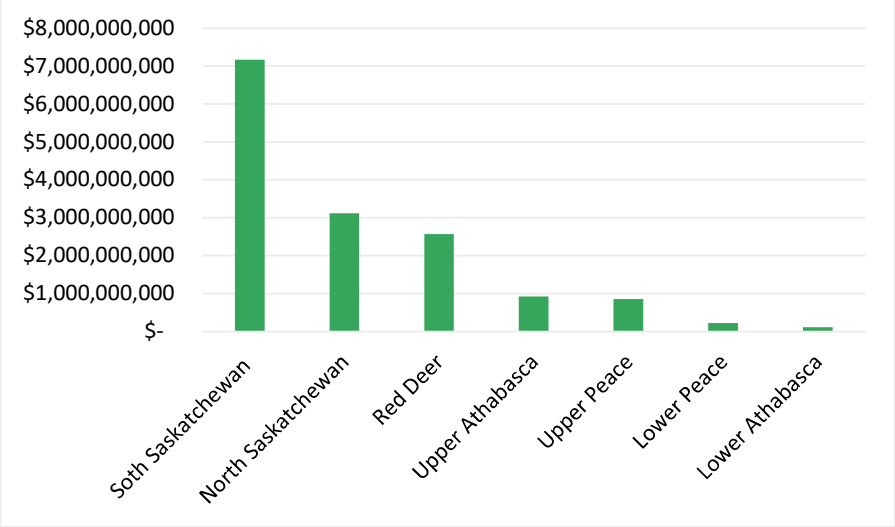
Source: 2016 Census of Agriculture, Statistics Canada

In 2016, Lethbridge County produced nearly 19 million kilograms of poultry. Lethbridge County had a poultry inventory of 1.5 million birds on 177 farms.

Expenditures

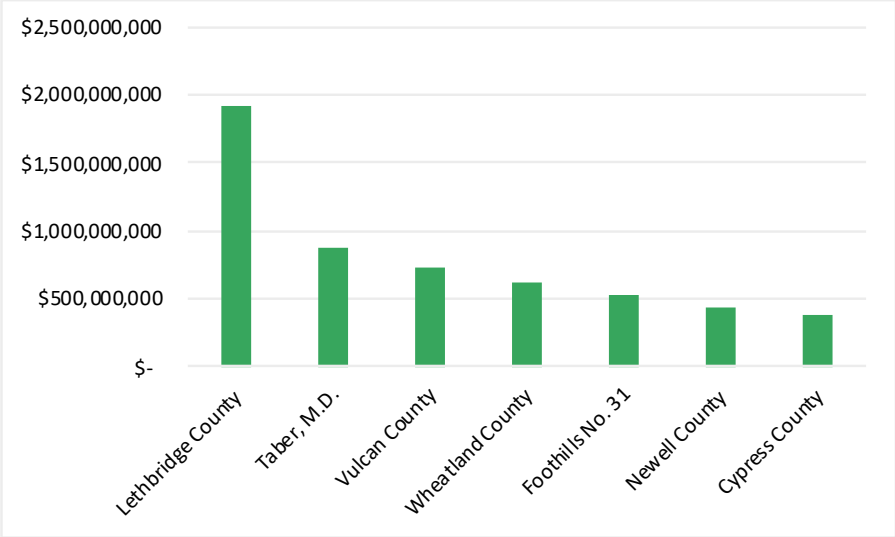
Total farm business operating expenses, which include livestock and poultry purchases, feed for livestock; are also largest in the South Saskatchewan Region and Lethbridge County in particular. Figure 6 below shows the overall farm expenses across the province of Alberta (for 2015), while Figure 7 breaks down the South Saskatchewan region showing the municipalities with the largest overall Farm Operating Business Expenses (2015). Total operating expenses for Lethbridge County have increased significantly from 2010 to 2015, from $975 million to $1.9 billion, a 96% increase.

Figure 6: Total Farm Expenses, by Land Use Region



Source: 2016 Census of Agriculture, Statistics Canada

Figure 7: Total Farm Expenses, South Saskatchewan Region by County



Source: 2016 Census of Agriculture, Statistics Canada

The Census of Agriculture provides an estimate of Gross Farm Receipts. While this number cannot simply be used with input-output multipliers, it does provide a general estimate of overall economic impact, allowing one to readily compare between all of the relevant Alberta counties due to this statistic having been compiled for all Census subdivisions during the 2016 Census based on 2015 receipts.

Table 1 on the next page gives an overview of the Counties having the largest overall Gross Farm Receipts in Alberta. Lethbridge County is the only County in Alberta that generates over $2 billion in gross farm receipts, with Taber being the next largest at only $1 billion. Furthermore, among municipalities with significant farm cash receipts, Lethbridge County has exhibited the third highest percentage increase (tied with Cardston County) in gross farm receipts after Foothills County and Cypress County (2011 to 2016). In terms of absolute dollar value increases in gross farm receipts, Lethbridge growth far exceeds any of the other municipalities in the province with growth over five years of over $950 million.

Table 1: Alberta Counties with Gross Farm Receipts > $250 million[4]

County	Gross Farm Receipts (2011)	Gross Farm Receipts (2016)	Gross Farm Receipts - Increase	
			$	%
Lethbridge County	$1,058,080,453	$2,014,276,406	$956,195,953	**90%**
Taber	$674,104,250	$979,079,480	$304,975,230	**45%**
Vulcan County	$534,826,356	$864,818,487	$329,992,131	**62%**
Wheatland County	$485,025,244	$716,532,737	$231,507,493	**48%**
Red Deer County	$331,093,123	$414,855,319	$83,762,196	**25%**
Lacombe County	$311,827,528	$377,167,017	$65,339,489	**21%**
Kneehill County	$301,741,391	$468,464,985	$166,723,594	**55%**
Willow Creek No. 26	$288,432,797	$411,030,700	$122,597,903	**43%**
Newell County No. 4	$286,986,982	$523,056,397	$236,069,415	**82%**
Vermilion River County	$278,186,370	$405,991,767	$127,805,397	**46%**
Rocky View County	$269,453,933	$388,187,370	$118,733,437	**44%**
Forty Mile County No. 8	$253,907,405	$431,457,264	$177,549,859	**70%**
Ponoka County	$248,891,989	$360,543,675	$111,651,686	**45%**
Mountain View County	$245,142,082	$305,648,951	$60,506,869	**25%**
Warner County No. 5	$243,166,536	$369,928,082	$126,761,546	**52%**
Foothills No. 31	$236,853,782	$580,276,130	$343,422,348	**145%**
Cypress County	$236,366,183	$454,408,183	$218,042,000	**92%**
Barrhead County No. 11	$166,203,344	$262,293,062	$96,089,718	**58%**
Westlock County	$230,608,796	$317,389,229	$86,780,433	**38%**
Camrose County	$224,398,954	$341,719,000	$117,320,046	**52%**
Flagstaff County	$198,671,620	$290,728,550	$92,056,930	**46%**
Minburn County No. 27	$212,292,483	$283,877,909	$71,585,426	**34%**
Wainwright No. 61	$153,169,323	$277,902,769	$124,733,446	**81%**
Stettler County No. 6	$185,320,567	$281,002,754	$95,682,187	**52%**
Cardston County	$162,733,191	$309,365,673	$146,632,482	**90%**

Value-Added Agriculture

The economic impact methodology we have employed is based on primary production capacity and its effects on the overall economy. However, it should also be noted that the County has also experienced significant growth in value-added agriculture. The growth is being driven by existing businesses which have expanded operations in recent years as well as new agri-businesses that have moved into the County.

The 2014-2020 time period has been largely positive for agriculture and agri-food companies in Lethbridge County. The County has been fortunate to see several existing agricultural and agri-food businesses significantly expand their operations. There have also been several new agriculture sector companies establish themselves and begin operations during that time period. This section will provide a brief profile and overview of some of these companies as a way of connecting real world examples with the numbers and statistics included in the report.

4 2016 Census of Agriculture, Statistics Canada

Business Expansions

Agropur Cheese Factory (Diamond City) – Produces various types of cheese for the wholesale grocery market. At one time a farm, Sunnyrose Cheese (now Agropur) was started in 1991 as a family business with six employees. A larger plant was built in 1997, and in 1998 the plant was acquired by the Quebec-based co-op Agropur. At the time of Agropur's acquisition, the factory had 14 employees and was producing around 800,000 kilograms of cheese per year. Since that time, Agropur has regularly invested in the plant to increase its capacity, with the last major expansion coming in 2016/2017. Today, the facility employs 100 workers and uses 50 million liters of Alberta milk to produce Havarti, Monterey Jack, Brick, Colby, Cheddar, Mozzarella, Allegro, Parmesan, Asiago, Edam, Gouda, and Swiss cheeses. There are no retail sales onsite – all cheese produced is shipped to grocery stores across western Canada. The Agropur cheese factory in Diamond City is the largest cheese factory in Alberta.

Broek Pork Acres – Produces high quality, free range, naturally-raised pork for wholesale and retail sale as well as restaurants. Founded by Allan and Joanne Vanden Broek, Broek Pork Acres initially started as a small grain farm in 1994. A small hog herd was added in 2000, and in 2005 a switch was made from only hog barns to include free range, pasture hogs. A provincially inspected butcher shop was added in 2007, with another expansion taking place in 2009. At the beginning of 2018, a new, larger shop was opened which includes a retail store front. Pork products produced and sold (both retail and wholesale) include various fresh meat cuts, dry cured/brined/smoked products, sausage, bacon, and meat snacks (e.g. jerky, pepperoni sticks). Broek Pork meat is also served at various fine restaurants across southern Alberta.

Broxburn Vegetables and Café – Produces high-quality vegetables and berry fruit for whole and retail sale, restaurants, as well as donations to Lethbridge and Calgary soup kitchens. Broxburn's history dates in Lethbridge County dates back to 1994 when Paul and Hilda de Jonge purchased their land, initially intended for a U-pick operation. In 1996 a small greenhouse was built to grow peppers, with a larger greenhouse being added in 2001 to include tomatoes and cucumbers in the crop mix. In 2004 an onsite café with a menu incorporating the farm's vegetables and berries was opened and has been in operation ever since.

Broxburn Vegetables presently operates a 3-acre greenhouse, in addition to u-pick berries (in season). Greenhouse vegetable crops include tomatoes, long English cucumbers, mini-cucumbers, eggplant, beans, and butter head lettuce. The superior-quality vegetables grown at Broxburn are in constant demand in higher-end restaurants in Lethbridge, Calgary, and Banff, as well as farmers' markets across southern Alberta (Calgary and south). In 2019, Broxburn added a mobile "vegetable truck" to its Calgary operations to allow

for greater flexibility in reaching customers in that market. Broxburn also continues to be a quiet, but extremely generous, supporter and supplier of fresh vegetables to Lethbridge and Calgary soup kitchens.

Corteva Agriscience Canola (formerly DuPont-Pioneer) – Processes Brevant & Pioneer brand seed canola for sale to farmers across North America. The Corteva facility was established in its current location in Lethbridge County under the DuPont-Pioneer name in 2007. The plant has underdone several significant expansions since then, most recently a two-phase expansion in 2018 and 2019. In this latest expansion, the plant doubled its onsite warehouse capacity, added 1,000 tons of onsite bulk storage capacity, added a state-of-the-art seed cleaning tower to improve processing capacity, and also cutting-edge packaging equipment to improve quality and throughput capability. The facility currently employs approximately 80 people.

Crystal Springs Cheese Ltd. – Produces cheese curds, gouda, cheddar, Havarti, feta, and yogurt. Crystal Springs Cheese was initially established in 1984. Purchased by Evert and Jannie Beyer in 2005, it is a family operation that has grown substantially beyond its origins. After the 2005 purchase, the production focus for the first few years was Gouda and Feta cheese. Demand was such that the original 7,000 square foot facility was doubled in size to 14,000 square feet in 2014, and a yogurt vat for Bles Wold brand yogurt was added that same year. In 2018 a new 650 square foot store and deli-style restaurant opened. A unique feature of the store and deli includes three large windows (with seating) into the cheese factory so that customers can directly observe the cheese production process. In 2020, an outdoor patio was added to the deli so that customers can enjoy their food outside.

Luco Farms Mustard – Produces a variety of hand-crafted, stone ground mustards. Luco Farms is a family-owned business that started in 1937. Over time, the focus of the farm changed from cereal and oilseed crops to producing high-quality fresh mustard products in a variety of flavors. While Luco Farms does not have a storefront, it does sell product at local farmers markets and wholesales its mustard at select food stores in Lethbridge, Medicine Hat and Calgary. Luco Farms has been steadily growing in capacity and sales over the 2014-2020 period.

McCain Foods – Produces French fries and potato breakfast patties for restaurants and wholesale market. One of Canada's more longstanding and well-recognized brands, the McCain potato plant near Chin in Lethbridge County began operation in the early 2000s. The plant currently employs around 250 people, and has undergone several enhancements and expansions, most recently in 2017. Potato products produced at the county

facility are shipped across North America as well as into various Asian markets.

New Businesses

Corteva Corn Research Facility – Research facility for fast-maturing Corteva (formerly DuPont-Pioneer) corn variants (possibility of soybean research in the future). Site selection for the then DuPont-Pioneer corn research facility began in the fall of 2013, with building construction starting in 2014 and ribbon cutting (official opening) in 2015. The facility has been operational since 2015. While not commercial per se, the facility is engaged in experimental corn variety breeding and evaluation with the goal of reducing the number of growing days to maturity in order to extend corn's range as a viable crop.

Prairie Hill Fruits – Processes and packages haskap berries for retail and wholesale customers. From the first haskap berry bush planted in 2013, Prairie Hill Fruits has grown to be the largest haskap producer in Canada. Led by founder and owner Rex Vandenberg, Prairie Hill remains a family-owned and operated business, with a new processing facility and retail operation constructed near Picture Butte in 2019/2020. Packaging, wholesale and on-site retail sales are done from the new facility, with wholesale haskaps going to restaurants, grocers, and food processors across the region.

Whole Leaf Foods (Star Produce) – Large-scale advanced greenhouse operation that grows live lettuce for the wholesale and restaurant market. From its start in 2017, the Star Group's Whole Leaf lettuce greenhouse facility east of Coaldale has grown (no pun intended) rapidly and now produces over 20 million heads of fresh lettuce per year. A head of lettuce grown at the facility has a maturity cycle of 21 days and can be grown year-round using approximately 100 times less water than field grown lettuce. There are no direct sales at the facility, but Whole Leaf lettuce can be purchased (under the Inspired Greens brand) at all major Canadian grocery chains and some specialty grocers. In the summer of 2020, Whole Leaf signed a widely publicized agreement to supply Wendy's Restaurants (Canada) with fresh lettuce for its menu items.

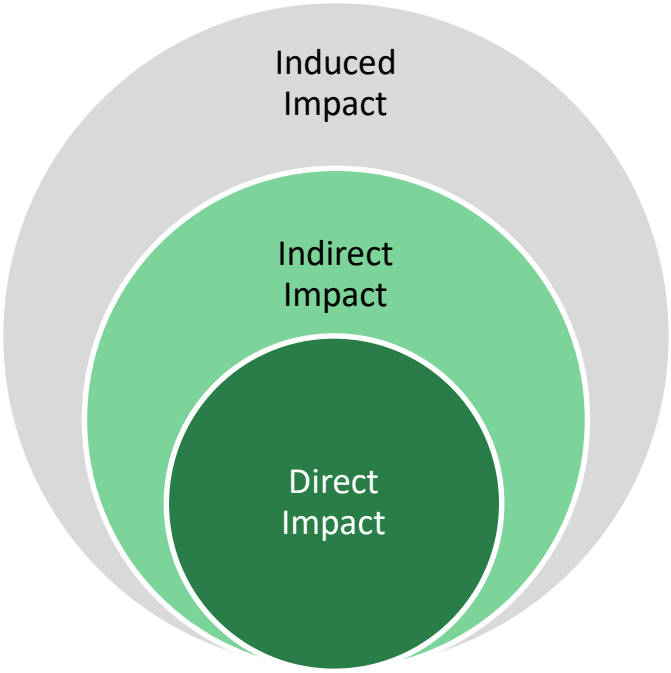
Leading agribusinesses including including Agropur, Broek Pork Acres, Broxburn Vegetables and Café; Corteva Agriscience, Crystal Springs Cheese, Luco Farms Mustard and McCain Foods have all undergone business expansion. These expansions highlight the County's business friendly environment and illustrate the strength of the agriculture and food sector in the region.

Since its inception in 1991, Agropur has gone from employing 14 workers to 100 today. In addition to the job creation which it has facilitated, it also sources 50 million liters of Alberta Milk, supporting farmers and contributing to economic growth beyond Lethbridge County.

Methodology

Economic multipliers are used to measure the economic activity that is generated when purchases and investments are made by a business, including the resulting spin-off activities. Economic impacts measured for the various agriculture sectors in Lethbridge County consist of the following categories:

Figure 8: Types of Economic Impact



- **Direct Impacts**
  the effects occurring to spending of the firm where the new economic activity takes place (e.g. the livestock operation must add employees and buy feed, etc.)
- **Indirect Impacts**
  the effects occurring to the backward-linked industries that supply the firm creating the new economic activity (e.g. feed producers must increase production)
- **Induced Impacts**
  some of the additional income of employees is spent on goods and services (by employees of the feeding operation and its upstream industries)

Categories of Impact

The direct, indirect and induced impacts of the agricultural industry can be quantified in a number of different ways. The categories of impact that were calculated for the various sectors include the following:

- **Gross Output:** is a measure of all sales by producing companies in the province or region. This includes intermediate goods and services consumed in the production process.
- **GDP:** Gross Domestic Product can be defined as gross output with all intermediate goods and services subtracted.
- **Labour Income:** the gross income earned by employees in the region.
- **Employment:** the number of people employed in the region.

Each of these categories will have direct, indirect and induced effects. For example, the employment impact would include the following types of impact:

- **Direct employment impact**: the employees working in the agriculture industry
- **Indirect employment impact**: the employees working in the agriculture and agribusiness supply industries
- **Induced employment impact**: the additional employment that results from the increased consumer spending flowing from direct and indirect impacts

There are several different methods of quantifying economic impact depending on the information available. Generally speaking, the economic multipliers used in an input-output model are meant primarily to model the change in output generated by an individual enterprise or change in scope of an enterprise, not of the entire industry. In fact, the Alberta Finance document Alberta Economic Multipliers 2013 states:

> *"Due to the limitations of the I/O model, it is unlikely that many of the assumptions and caveats associated with the multipliers would hold fully in the real world. It is important to understand the limitations and apply the multipliers in a reasonable way."*

However, it is possible to compare the general and relative magnitude of a practice of using the multipliers in this way has developed in order to compare the relative impact of various industry sectors. The results should be treated as general estimates only and not as absolute values. The reader of the current report is reminded that this is appropriate use of the estimates generated through the economic impact modelling methodology.

Economic Multipliers

Given that the datasets available lend themselves to estimation of gross output much more readily than expenditures, we have chosen to use the "simple

multipliers" based on commodity supply ratios from in the Alberta Economic Multipliers 2013. In practice, this means that we employed Table 1 of the Alberta Finance multiplier tables to estimate the direct and indirect impacts (a GDP multiplier of 0.587 for all of the category "crop and animal production" and an output multiplier of 1.917). For the total impact including induced impacts as well, Table 5 was used, with a GDP multiplier of 0.692 and a total contribution (Output) multiplier of 2.094.

The labour income multipliers used were 0.171 for direct and indirect impacts and 0.212 for total impacts, including induced effects.[5]

An estimate of gross output for each of the agricultural sectors was created using data from a large variety of sources, depending on the availability of price and production data, largely from federal and provincial government sources. A full listing of references reviewed in the course of this study is included as Appendix A.

Caution must be exercised in interpreting the results, whether they be for GDP, Total Contribution, or Employment/Income. In all cases, Alberta Finance provides multipliers for the entirety of the "crop and animal production" industry. The multipliers do not differentiate based on either location within the province or subsector. The model is exactly that … a model, designed to allow for comparison of the approximate and relative size of economic elements. This is particularly the case for labour income. There are known to be large differences in terms of labour requirements per dollar of output (between greenhouses or broiler chickens, for example), but the multiplier model uses one multiplier across the entire agricultural sector.

Capital Costs

Initial construction of the large feedlot operations in the County would have had significant economic impact, especially in terms of increased employment, at the time of initial construction. The economic impact of initial construction is not included in the economic impact estimates. However, the economic impact does include the cost of capital replacement, as it includes depreciation costs and building repair in the direct expenditures of the sectors. However, the economic impact does not include the initial investments made in constructing the infrastructure.

5 The Table 5 Labour Income multiplier for crop and animal production was initially published as 0.258. Alberta Finance was to prepare and publish a reprint after re-examining this number and determining that the multiplier should be 0.307.

Time Adjustment

Data was sought out and drawn from a number of different sources to arrive at an estimate of economic impact. The most comprehensive and accurate data source for inventory of livestock was the 2016 Census of Agriculture.

- Livestock inventories were drawn from the 2016 Census of Agriculture, which is based on the inventory on a single day, being May 10, 2016. Given the nature of livestock production and the variability that can occur over time, the economic impact would be expected to vary along with the total inventory. Using this one consistent dataset allows for the most reliable comparison between the various sectors.

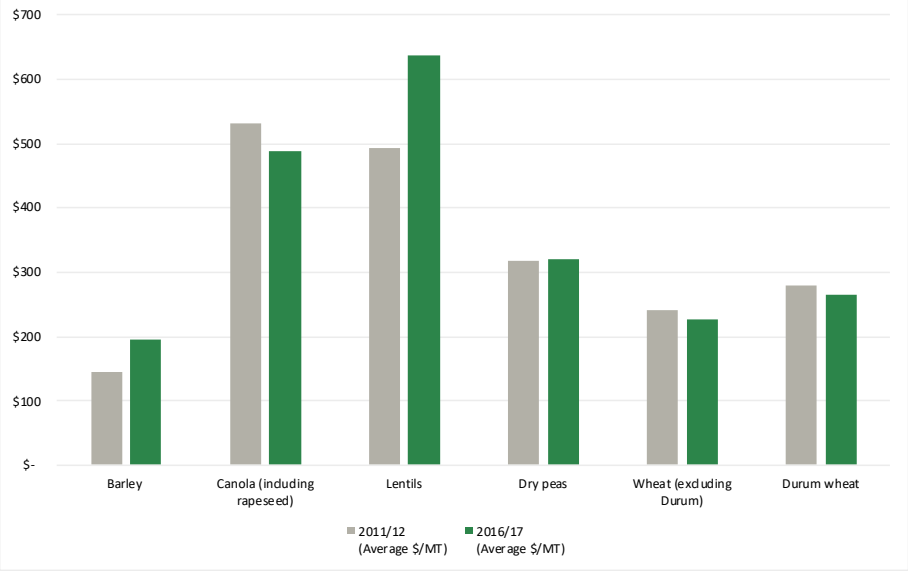
- Crop acreages for the province of Alberta are available on an annual basis, but that does not include acreages to the County or census subdivision level. We have therefore also used 2016 Census of Agriculture as estimates of the size of the crop sectors.

- The most current economic multipliers published by Alberta were issued on August 2017, based on 2013 input-output data.

- Between 2011 to 2016, there have been significant variations in the prices of major crops. While barley and lentil prices have increased, canola and wheat prices have slightly decreased. Changes in crop prices impact their overall contribution to the economy.

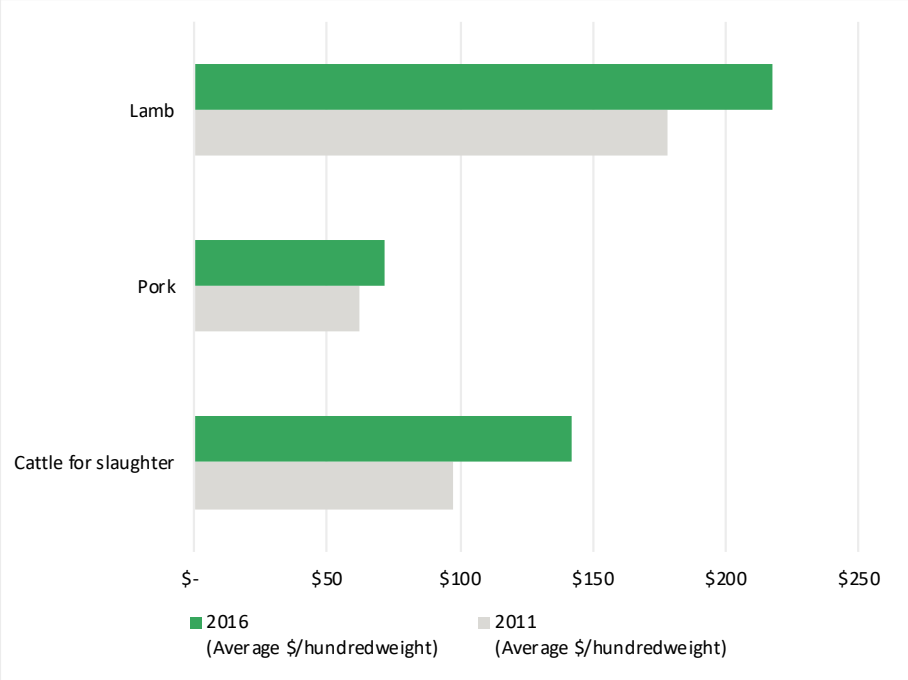
- From 2011 to 2016, the prices of all three major livestock animals increased, with cattle prices seeing the biggest jumps. This undoubtedly amplifies the effect that the livestock sector has on the overall economy.

Figure 9: Comparison of $/MT for Major Crops (2011/12 vs. 2016/17)



Source: Statistics Canada, Table: 32-10-0077-01 (formerly CANSIM 002-0043)

Figure 10: Comparison of $/MT for Major Livestock (2011/12 vs. 2016/17)



Source: Alberta Economic Dashboard, Alberta Lamb Market Reports

Livestock Inventory

Various potential data sources were examined to find the most accurate and most recent source for the scope of agricultural subsectors within Lethbridge County. Most agricultural statistics are not available at such a small scale. They are commonly expressed either at the Agricultural Land Use scale or Census Divisions (not Census Subdivisions).

This is the case for crops as well, where acreage by County is only released from Census of Agriculture data, not by the annual Farm Financial Survey or from AFSC crop insurance.

This presented a particular challenge for estimating the scope of the livestock sectors, however, given the large variability in production size from year to year. Given the size of the cattle feeding industry in Lethbridge County, getting the best data source was of high importance.

In the end, we concluded that the best data source to serve as the basis for estimating an individual sector's gross output by County is the 2016 Census of Agriculture. Our project team mainly relied on the Government of Alberta's Economic Dashboard for livestock prices.

In the end, it is our opinion that in order to best meet the purpose of this element of the project (comparing approximate scope of the beef sector against other sectors within the County), Census of Agriculture inventories be used as the basis for all of the species. For that reason, Census inventories were used as the basis to prepare an estimate of the total annual production. 2016 price data was then applied to arrive at an approximation of the total output of that sector's primary product.

Feed

The economic impact analysis methodology used is based on the gross output of a sector. In the case of crops, this includes the estimated market value of the crops and the average crop prices for the 2016 crop year. The total direct, indirect and induced effects of that output are already captured in the estimates of crop sectors, so they should not be captured in the livestock sector.

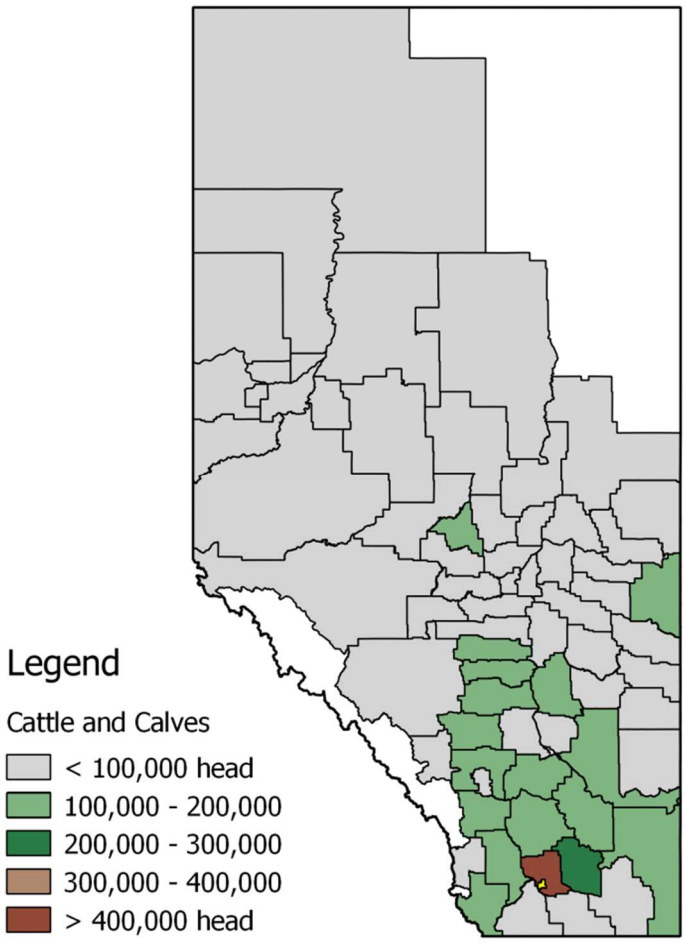
We have therefore estimated the ratio of feed costs to gross output for all of the relevant livestock sectors and discounted the total output accordingly. Wherever possible, only the purchased primary feeds are removed, while all feed supplements, minerals, and pasture costs remain included in the calculation of economic impacts.

Economic Impact

Livestock Sectors

Lethbridge County is a hotbed of the cattle industry, with heavy emphasis on confined feedlot feeding. The map below shows the distribution of cattle numbers across Alberta's counties with strong centralization of distribution in southern Alberta, particularly Lethbridge County.

Figure 9: Distribution of Cattle and Calves across Alberta Counties[6]



The total contribution to the economy from the feedlot sector was estimated using the 2016 Census estimate of 477,807 head[7]. As the census statistics do

7 We used as an estimate of the number of feeder cattle in May 2016, the number of heifers for slaughter for feeding, steers one year or over, and the total calves under one year old. We subtracted from this 22,607 calves (to match the number of beef cows), as these are included in the impact estimate for the cow-calf sector that follows.

not differentiate directly between background feeder cattle and those in finishing feedlots, we have assumed that all feeders will be finished within the County. The gross output was then estimated using an average turnover of 2.25 cycles per year, and an average price of $142.04/cwt for finished cattle. In order to not double count the impact of feed grown within the County or count the contributions of feed grown elsewhere, the cost of feed is removed from the impact estimates.

Using this methodology, we estimate a contribution of $538 million toward Gross Domestic Product from beef feeding operations in Lethbridge County, with a total contribution to the economy (including direct, indirect, and induced impacts) of $1.6 billion.

Table 2: Impact of Beef Feeding in Lethbridge County

	Direct & Indirect Impact	Induced Impacts	Total Impact
GDP	$456,734,000	$81,698,586	**$538,432,586**
Total Output	$1,491,582,755	$137,720,473	**$1,629,303,229**
Labour Income	$133,051,983	$31,901,353	**$164,953,335**

While feedlots are the largest part of the beef sector in the County, there is also a significant cow-calf sector, which is estimated to contribute $19.5 million to the economy, for a contribution of $6.4 million to GDP. This is based on an inventory of nearly 23,000 cows and includes the value of culls.

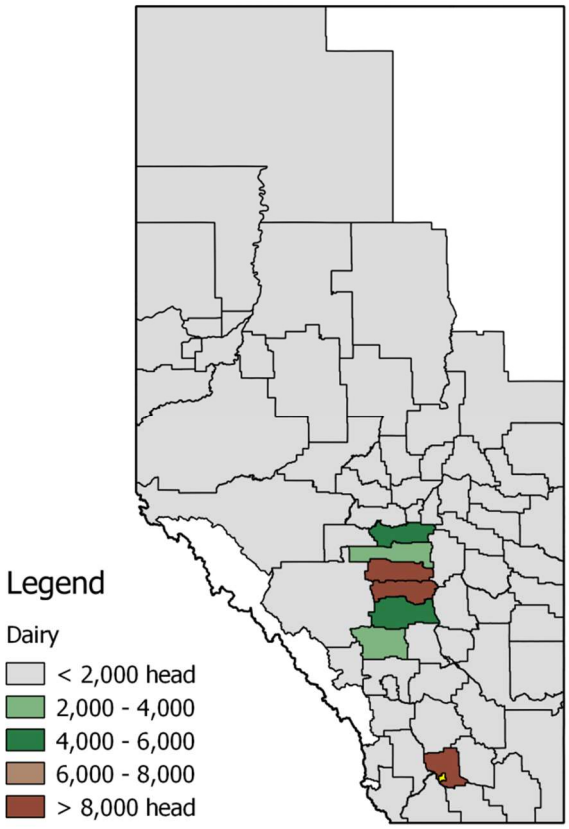
As is the case for the other livestock sectors, the cost of purchased feed has been excluded. The cost of pasture, however, is included as this this is not otherwise accounted for in the economic impact estimates.

Table 3: Impact of Cow-Calf Operations in Lethbridge County

	Direct & Indirect Impact	Induced Impacts	Total Impact
GDP	$5,468,296	$978,145	**$6,446,441**
Total Output	$17,858,133	$1,648,873	**$19,507,006**
Labour Income	$1,592,979	$381,942	**$1,974,921**

There is also a significant dairy sector in Lethbridge County, as compared to most other counties in Alberta. Lethbridge County had an inventory of 9,272 dairy cows in the 2016 Census.

Figure 10: Distribution of Dairy Cows across Alberta Counties[8]



We estimate that the total contribution to the economy from the dairy sector in Lethbridge County is almost $95.6 million, with a contribution of $32 million to Gross Domestic Product. This estimate is based on 9,272 dairy cows and a 2016 average Gross Income for Southern Alberta of $8,075 per cow.

Table 4: Impact of Dairy Operations in Lethbridge County

	Direct & Indirect Impact	Induced Impacts	Total Impact
GDP	$26,811,666	$4,795,954	**$31,607,620**
Total Output	$87,560,414	$8,084,608	**$95,645,022**
Labour Income	$7,810,553	$1,872,706	**$9,683,259**

While beef and dairy operations represent by far the largest livestock sectors in the County, the poultry, pork, and sheep sectors also make significant contributions to the economy, as outlined below in Table 5 to Table 7.

Table 5: Impact of Broiler Chicken Production in Lethbridge County

	Direct & Indirect Impact	Induced Impacts	Total Impact
GDP	$1,304,933	$233,421	**$1,538,354**
Total Output	$4,261,597	$393,481	**$4,655,077**
Labour Income	$380,142	$91,145	**$471,288**

Table 6: Impact of Pork Operations in Lethbridge County

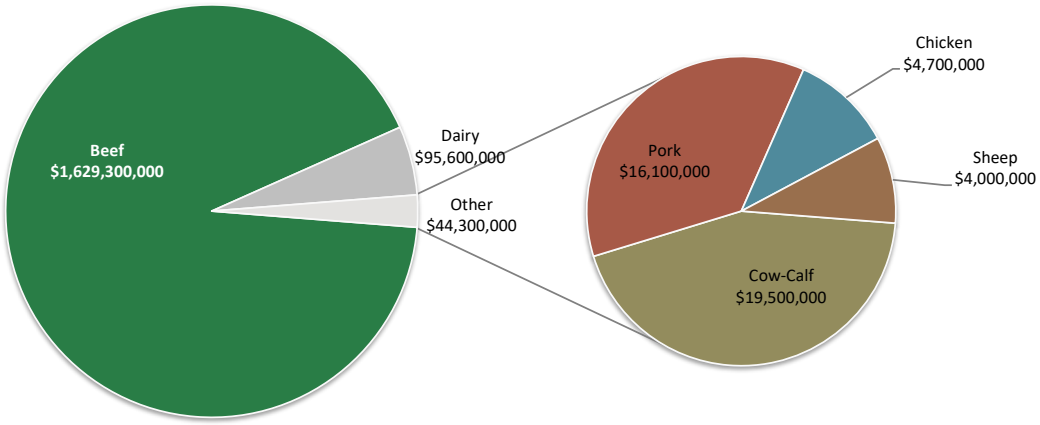
	Direct & Indirect Impact	Induced Impacts	Total Impact (2016)
GDP	$4,499,513	$804,853	**$5,304,367**
Total Output	$14,694,322	$1,356,753	**$16,051,075**
Labour Income	$1,310,761	$314,276	**$1,625,037**

Table 7: Impact of Sheep Production in Lethbridge County

	Direct & Indirect Impact	Induced Impacts	Total Impact (2016)
GDP	$1,120,144	$200,366	**$1,320,510**
Total Output	$3,658,118	$337,761	**$3,995,879**
Labour Income	$326,311	$78,238	**$404,549**

The diagram below illustrates the relative contributions of all of the livestock sectors analyzed in this study. Beef makes by far the largest contribution, representing 92% of the livestock sector and 74% of the total agricultural contributions of the County.

Figure 11: Lethbridge County Livestock Sectors – Total Contribution to Economy



Crop Sectors

The 2016 Census of Agriculture was used to determine the most common crops in Lethbridge County and their estimated acreage. The crops with more than 1,000 acres are outlined Table 8 below.

Table 8: Lethbridge County Crop Acreages[9]

Crop	# Farms	Acres
Spring wheat (excl durum)	253	111,562
Barley	307	92,621
Canola (rapeseed)	199	90,475
Alfalfa and alfalfa mixtures	322	41,328
Durum wheat	131	61,816
All other fodder crops	136	19,558
Corn for silage	92	30,531
Dry field peas	115	44,619
Winter wheat	67	17,917
Sugar beets	41	4,970
Oats	31	3,594
Flaxseed	24	5,586
Triticale	10	1,322
Forage seed for seed	14	2,911
Lentils	24	20,847

9 2016 Census of Agriculture, Statistics Canada

Other dry beans	26	3,469
Potatoes	12	2,480

All other crops had acreages significantly below 1,000 acres each and were therefore not included in the overall analysis of the crop sector's economic impact.

In addition, as the purpose for calculating the impact of individual crops is merely for comparison relative to the other crops, only those crops with relatively complete and accurate data sources are included in the impact results outlined below. The impact of some crops would require considerably more investigation – alfalfa, for example, may have been grown as feed for livestock within the County, in which case care would need to be taken to not include its impact, as it is already counted as an input to livestock production. The prices or yields for some crops are also not readily available specifically for the County given the relatively small geography.

There were seven greenhouse operations in the County in 2016, with a total area of 65,667 square metres. Given that overall impact as a percentage of total agriculture impact will be small, average Alberta return benchmarks for commercial-scale greenhouse operations were used to estimate the overall sales and impact of the greenhouse sector. In Alberta, average gross revenue from greenhouse operations was approximately $101.82 per square metre.[10]

Pricing data was gathered from Statistics Canada.[11] Yield data was also obtained from Statistics Canada.[12] Estimates of total crop output value for Lethbridge County are outlined in the table below.

10 https://open.alberta.ca/dataset/fbb2b0b5-53b9-4dbd-92b7-f37ec8ed9369/resource/d074794d-7ec0-4bef-bc93-99a57bbc2cf2/download/2017greenhousecop.pdf

Average of cucumbers, tomatoes, pepper, bedding/ornamentals and tree seedlings.

11 Statistics Canada. Table 32-10-0077-01 (formerly CANSIM 002-0043). Monthly prices averaged for Sept 2016 – June 2017.

12 Statistics Canada. Table 32-10-0002-01 Estimated areas, yield and production of principal field crops by Small Area Data Regions, in metric and imperial units.

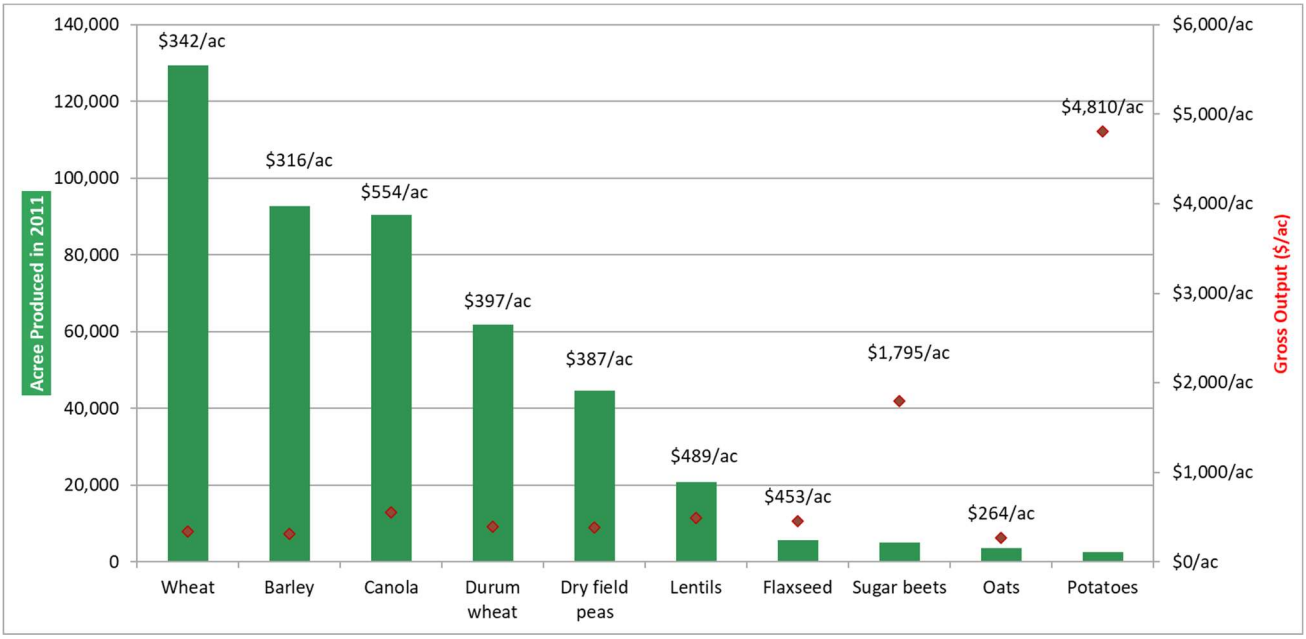
Table 9: Estimated Output of Key Field Crops, Lethbridge County 2016

Crop	# Farms	2016 Acres	Price ($/tonne)	2016 Yield		Crop Output	
				bu/ac	tonne/ac	$/ac	County 2016
Canola	199	90,475	$487.78	50.1	1.14	$554.24	**$50,145,126**
Wheat	253	129,479	$226.43	55.5	1.51	$341.70	**$44,242,806**
Barley	307	92,621	$195.73	74.1	1.61	$315.78	**$29,247,940**
Durum wheat	131	61,816	$264.97	55.0	1.50	$396.62	**$24,517,739**
Sugar beets	41	4,970	$55.49		32.35	$1,795.10	**$8,921,654**
Greenhouses	7	65,667 m2 x $101.82/m2					**$6,686,214**
Dry field peas	115	44,619	**$321.07**	44.3	1.21	$387.09	**$17,271,770**
Potatoes	12	2,480	$12.36	389.35		$4,810.42	**$11,929,840**
Flaxseed	24	5,586	$482.49	37.0	0.94	$453.47	**$2,533,064**
Oats	31	3,594	$189.69	90.2	1.39	$263.87	**$948,366**
Lentils	24	20,847	**$637.92**	28.2	0.77	$489.35	**$10,201,440**
							$206,645,959

Potatoes and sugar beets in particular produced a large gross value of over $4,810 and $1,795 per acre, respectively, while canola produced $554 per acre. Further, common crops including wheat, barley and peas produced in the range of $300-$400 per acre. Flaxseed and lentils exhibited higher returns in the $450-$500 per acre range, while oats provided relatively lower return at approximately $264 per acre.

The three largest crops by acreage were wheat, barley and canola which had gross revenue of $342, $316 and $554 per acre respectively. The acreage and gross output of the various crops is shown below in Figure 12.

Figure 12: Lethbridge County Acreage & Gross Output, by Crop in 2016



Between the three primary field crops for western Canada (wheat, barley, and canola), the value of the crop output is over $148 million. Sugar beets and pulses (peas and lentils) also generate considerable cash output, accounting $9 million and $27 million, respectively. The impact of those crops, based on the Alberta Finance economic multipliers, is as outlined in the tables below.

Table 10: Impact of Canola Production

	Direct & Indirect Impact	Induced Impacts	Total Impact (2016)
GDP	$29,435,189	$5,265,238	**$34,700,427**
Total Output	$96,128,207	$8,875,687	**$105,003,894**
Labour Income	$8,574,817	$2,055,950	**$10,630,767**

Table 11: Impact of Wheat Production[13]

	Direct & Indirect Impact	Induced Impacts	Total Impact (2016)
GDP	$40,362,440	$7,219,857	**$47,582,297**
Total Output	$131,813,966	$12,170,617	**$143,984,582**
Labour Income	$11,758,053	$2,819,182	**$14,577,236**

Table 12: Impact of Barley Production

	Direct & Indirect Impact	Induced Impacts	Total Impact (2016)
GDP	$17,168,541	$3,071,034	**$20,239,574**
Total Output	$56,068,301	$5,176,885	**$61,245,186**
Labour Income	$5,001,398	$1,199,166	**$6,200,563**

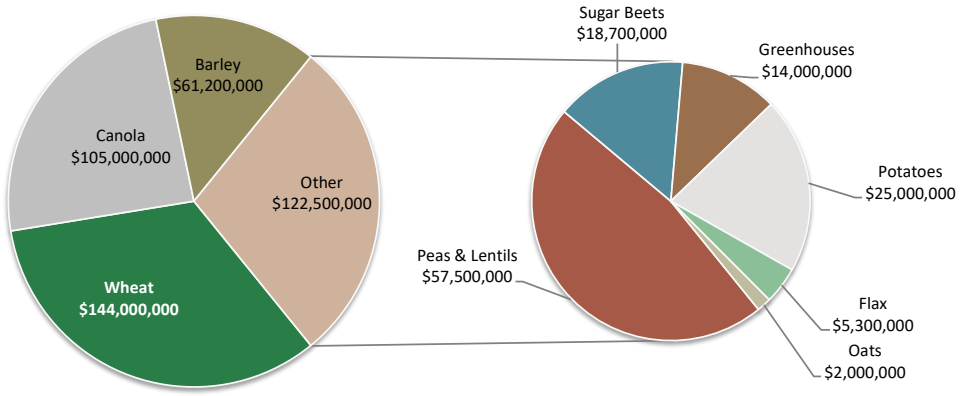
Table 13: Impact of Sugar Beet Production

	Direct & Indirect Impact	Induced Impacts	Total Impact (2016)
GDP	$5,237,011	$936,774	**$6,173,785**
Total Output	$17,102,812	$1,579,133	**$18,681,944**
Labour Income	$1,525,603	$365,788	**$1,891,391**

Wheat, canola and barley together make up over 70% of the total crop impact in the county, but there are several other crops that also make significant contributions in the millions of dollars annually. The relative impact of the various crop sectors in Lethbridge County is outlined in Figure 13 below.

13 Includes spring and durum wheat

Figure 13: Lethbridge County Crop Sectors – Total Contribution to Economy



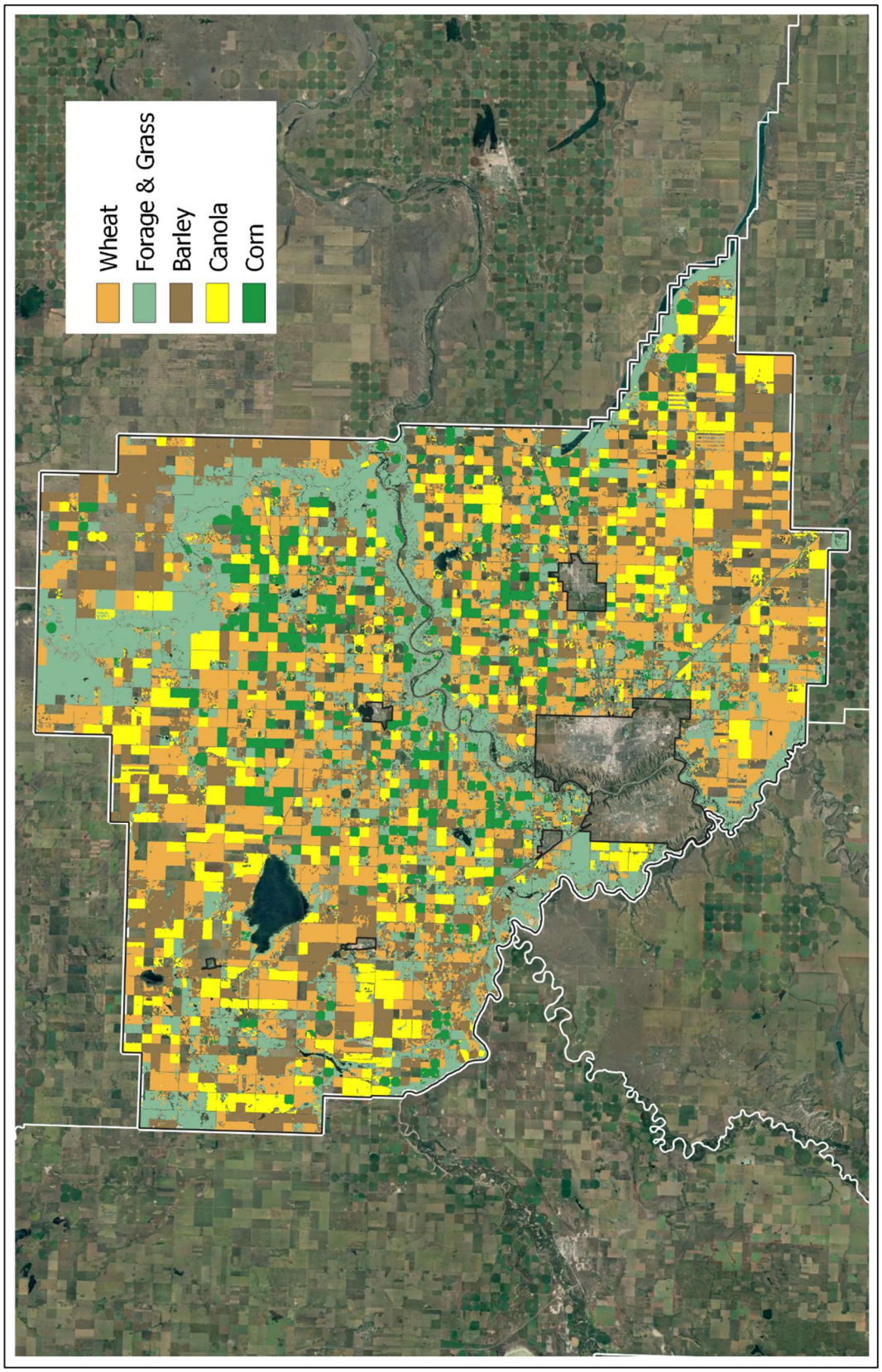
Crop Acreage Trends

Our economic impact analysis throughout is based largely on census data at the County level. Our methodology uses this approach to make the overall impact most comparable between crop and livestock sectors, for uniformity of approach. One significant limitation of that data is that it is collected only every five years and there is a time lag in presenting the data.

We have therefore also examined an annual data source to examine trends in crop production using remote sensing data compiled by Agriculture and Agrifood Canada, the Annual Crop Inventory. This data uses a combination of satellite imagery, radar data, and algorithms relating to crop growth to develop an inventory of crops at 25 metre scale.

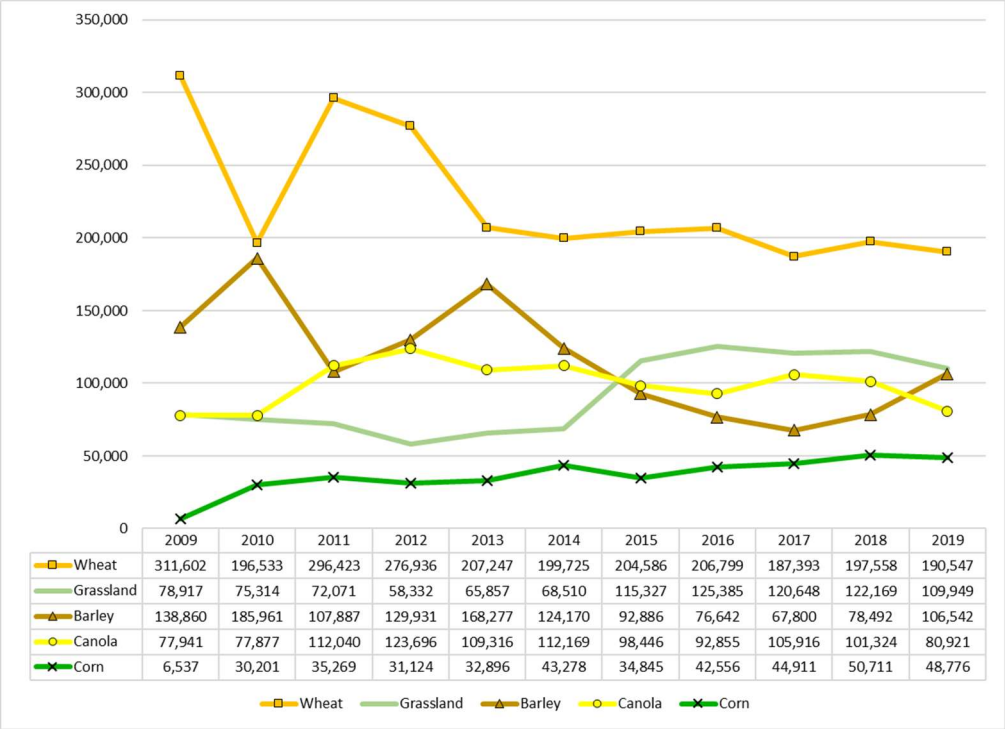
The map on the next page shows the location of the largest crops in terms of acreage in Lethbridge County in 2019.

Figure 14: Top Five Crops - Lethbridge County 2019



One crop in particular has made significant increases in acreage over the past few years. Corn, much of which is grown in the central corridor of the County, has grown from only 6,500 acres in 2009 to almost 50,000 acres in 2019. Most of the other crops have remained relatively stable, though barley acreage has seen considerable resurgence over the past few years as well, as outlined in the table below. It should be noted that the acreages calculated based on remote sensing will not perfectly match census data, but this does provide a valuable estimate of cropping trends.

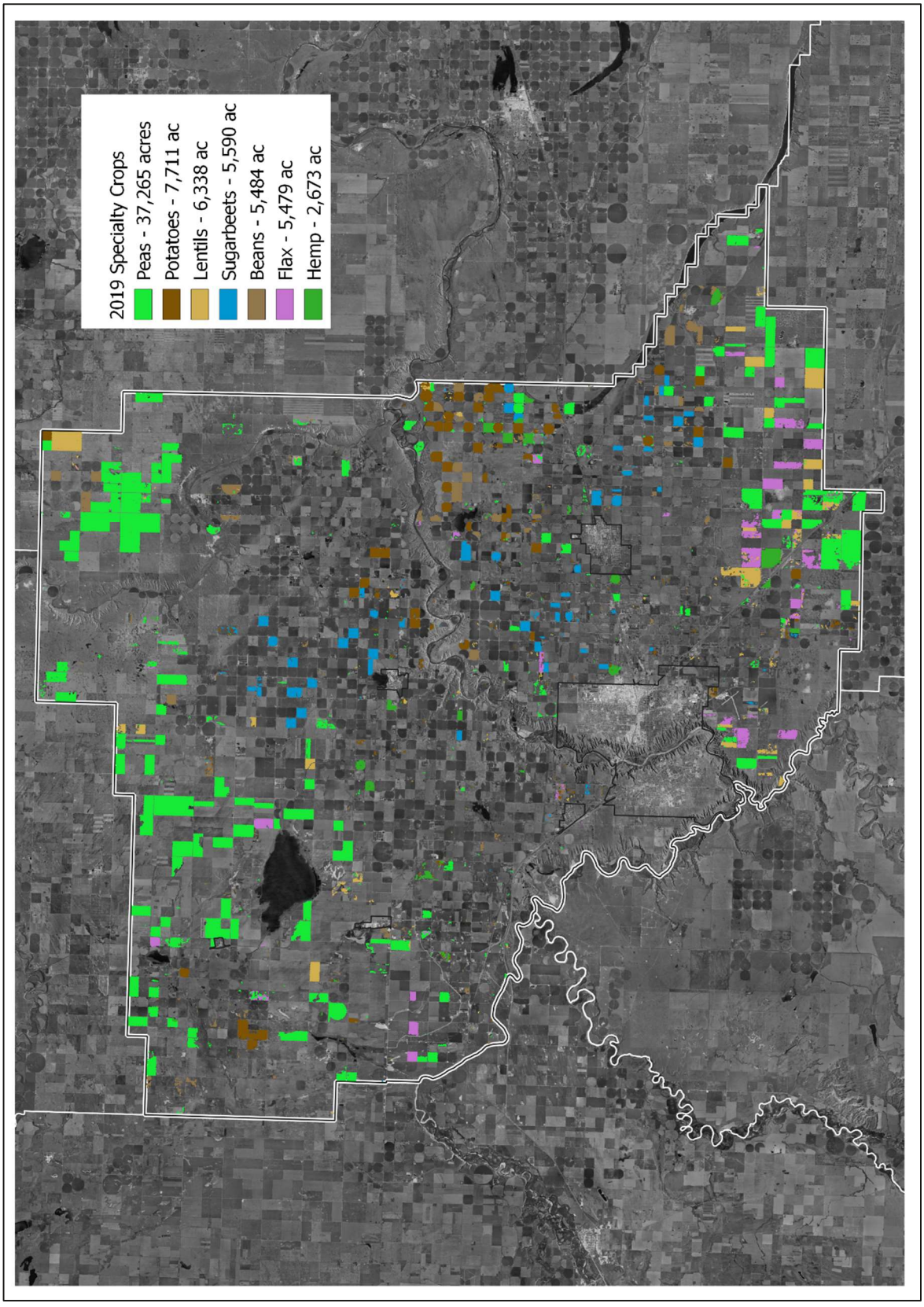
Figure 15: Acreage of Top 5 Crops, Lethbridge County 2009-2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Wheat	311,602	196,533	296,423	276,936	207,247	199,725	204,586	206,799	187,393	197,558	190,547
Grassland	78,917	75,314	72,071	58,332	65,857	68,510	115,327	125,385	120,648	122,169	109,949
Barley	138,860	185,961	107,887	129,931	168,277	124,170	92,886	76,642	67,800	78,492	106,542
Canola	77,941	77,877	112,040	123,696	109,316	112,169	98,446	92,855	105,916	101,324	80,921
Corn	6,537	30,201	35,269	31,124	32,896	43,278	34,845	42,556	44,911	50,711	48,776

It should not be forgotten, however, that there numerous other specialty crops grown in the County as well. The map below shows the locations of several of the more noteworthy and unique crops grown in Lethbridge County.

Figure 16: Larger-Acreage Specialty Crops, Lethbridge County 2019



2011-2016 Comparison

There have been some considerable changes in the agriculture sector as illustrated by the 2016 Census of Agriculture. The table below displays the magnitude of these changes.

Table 14: Changes in Total Output by Sub-Sector (2011-2016)

Sector	Total Impact (2011)	Total Impact (2016)	Total Impact (% change)
Feedlots	$621,479,102	$1,629,303,229	162%
Cow-Calf	$18,896,444	$19,507,006	3%
Dairy	$94,436,045	$95,645,022	1%
Pork	$16,413,027	$16,051,075	-2%
Sheep	$2,426,181	$3,995,879	65%
Broiler Chicken	$4,385,938	$4,655,077	6%
Canola	$117,523,786	$105,003,894	-11%
Wheat	$124,493,345	$143,984,582	16%
Barley	$56,327,259	$61,245,186	9%
Sugar Beets	$17,933,186	$18,681,944	4%
Peas & Lentils	$19,721,822	$57,528,902	192%
Flax	$4,595,628	$5,304,235	15%
Oats	$2,791,153	$1,985,878	-29%
Potatoes	$10,391,421	$24,981,084	140%
Greenhouses	$17,648,325	$14,000,932	-21%

The drastic increase in feedlots' total impact can be attributed to several factors including lower feed costs relative to 2011, an increase in the number of cattle in feedlots, as well as a significant increase in the in the price of slaughter cattle (+46%).

The economic impact of sheep operations has also increased significantly, driven largely by an increase in lamb prices (+22%) and a decline in feed prices.

The notable increase in total impact attributed to peas and lentils is largely due to the significant increase in pea acreage (+178%) and lentil acreage (+539%). Moreover, the potato acreage in Lethbridge County has increased by roughly 82%, resulting in an increase in the total impact of 140%.

Sector Comparison

It is clear from the analyses above that in Lethbridge County, that several agricultural subsectors are considerably larger than all of the others. Bovine sectors and the major field crops represent the largest contribution to the Alberta economy.

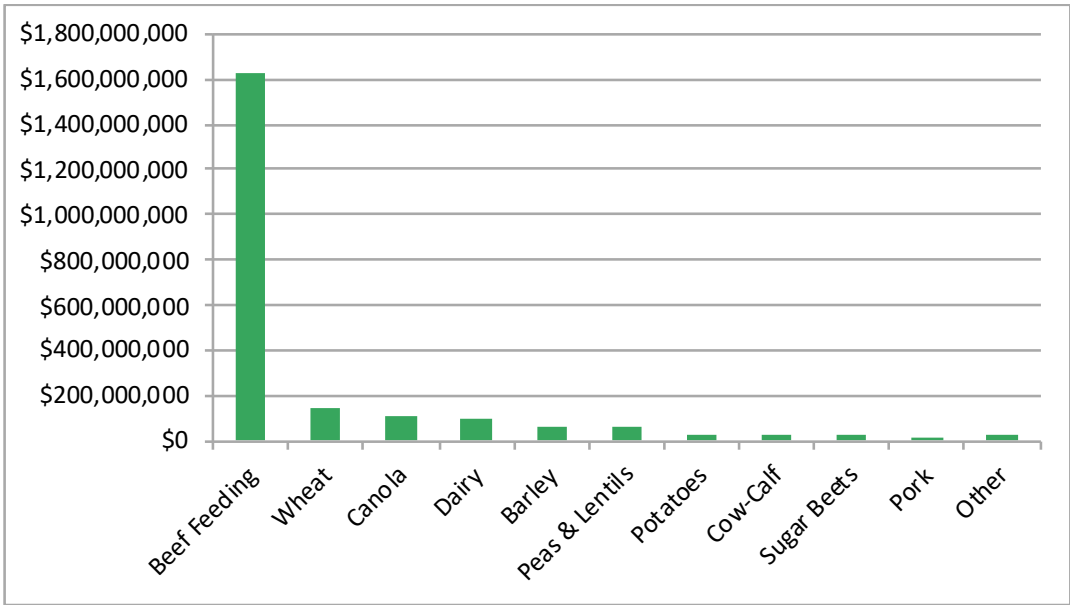
In total, for all of the livestock sectors reviewed in this the course of this project, we estimate a contribution of roughly $1.8 billion by Lethbridge County to the Alberta economy annually. Between beef feeding, dairy and the cow-calf sector, we estimate a total contribution of approximately $1.7 billion annually, or roughly 99% of the total livestock impact for the county.

Likewise, only three field crops make up 72% of the total estimated Lethbridge County crop-sector impact of $432.7 million. Wheat, barley and canola together have an estimated impact on the economy of approximately $310 million. Table 15 below and Figure 17 on the next page show the relative size of these key livestock and crop elements in Lethbridge County.

Table 15: Comparison of Lethbridge County Agriculture Sectors Contribution to Economy & GDP Impact

	Total Contribution to Economy	GDP Impact
Livestock		
Beef	$1,629,300,000	$538,400,000
Dairy	$95,600,000	$31,600,000
Cow-Calf	$19,500,000	$6,400,000
Pork	$16,100,000	$5,300,000
Chicken	$4,700,000	$1,500,000
Sheep	$4,000,000	$1,300,000
Livestock - Total	**$1,769,200,000**	**$584,500,000**
Crops		
Wheat	$144,000,000	$47,600,000
Canola	$105,000,000	$34,700,000
Barley	$61,200,000	$20,200,000
Peas & Lentils	$57,500,000	$19,000,000
Sugar Beets	$18,700,000	$6,200,000
Greenhouses	$14,000,000	$4,600,000
Potatoes	$25,000,000	$8,300,000
Flax	$5,300,000	$1,800,000
Oats	$2,000,000	$700,000
Crops - Total	**$432,700,000**	**$143,100,000**
Total -- Agriculture	**$2,201,900,000**	**$727,600,000**

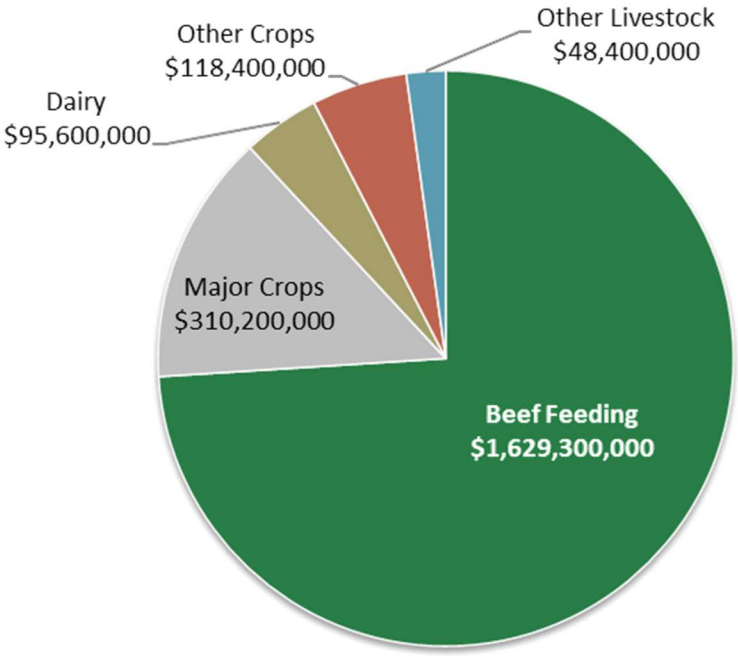
Figure 17: Lethbridge County Agriculture Sectors - Total Contribution to Economy



In total, we estimate that the agricultural sector in Lethbridge County contributed approximately $2.2 billion to the Alberta economy in 2016, with its contribution to Gross Domestic Product being approximately $728 million.

Of the total contribution of Lethbridge County agriculture to the economy, 80% comes from livestock sectors, with 74% being from beef feeding operations alone. 20% of the total agricultural contribution comes from crops, with wheat and canola making the largest contributions annually to the economy of over $100 million each.

Figure 18: Economic Impact Breakdown for Lethbridge County



Appendix: Livestock Inventories

2016 Census of Agriculture Livestock Inventories			
	# head		
Beef Cattle	**529,801**		
Heifers for slaughter or feeding	159,656		
Steers, 1 year and over	256,904		
Beef cows	22,607		
Heifers for beef herd replacement	5,278		
Bulls, 1 year and over	1,502		
Calves, under 1 year	83,854		
Dairy Cattle	**13,765**		
Dairy cows	9,272		
Heifers for dairy herd replacement	4,493		
Pork	**73,015**		
Grower and finishing pigs	35,386		
Weaner pigs	15,820		
Nursing pigs	15,311		
Sows and gilts for breeding	6,498		
Sheep & Goats	**18,016**		
Lambs	8,623		
Ewes	6,987		
Rams	333		
Goats	2,073		
		# farms	# head
Poultry			
Broilers, roasters and Cornish		28	1,398,462
Layer and broiler breeders		9	82,265
Laying hens		90	24,065
Pullets for laying		22	3,323
Other poultry		19	5,332
Turkeys		9	X