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Ontario Beef and Cattle Pricing 2016-2021

An Examination of Price and Margin Trends in the Ontario Cattle and Beef Industry

Executive Summary

Consumer beef prices have increased significantly at retail in the last two years. Consumers are questioning why beef prices have become so expensive. At the same time farmers are concerned about stagnating prices and their lack of profit.

This project will provide Beef Farmers of Ontario (BFO) with an examination of the price and margin trends in the cattle and beef industry in Ontario. Its purpose is to assess the reasons and implications behind the pricing performance through the industry.

The time frame focus for this analysis is from 2016 through 2021. This will be referred to as the research period.

Key Findings

- The main point of note for each of the calves, yearling and fed prices over the research period is the sideways pattern of pricing. The overall price differential from beginning to end was lower, but the main takeaway was the horizontal price movement or drift.
- Ontario beef packer cutout prices increased by 27% from the 2016 average through the 2021 average.
- Ontario retail beef prices increased by 10% from the 2016 average through 2021.
- There were very strong price relationships between the cattle farm and beef packer sectors from 2010 through 2017. The two prices moved almost in tandem together. From 2018 to 2021 there was almost no relationship amongst prices at the farm and packer levels.
- There were very strong price relationships between beef packer and retailer over the 2010 to 2017 period. The two prices moved closely together. From 2018 to 2021 there was a much weaker relationship between the two prices at the packer and retail levels.
- Unusual events such as the 2019 Tyson Foods Finney County plant fire and COVID, in combination with basic supply and demand factors, contributed to the dichotomy between the beef cutout and the retail and farm price.

- Another point of note is that, given the much slower rate of increase of farm prices compared to retail and packer, there is no basis to assert that farm prices are the cause of high retail prices. At the same time, however, there were also obvious reasons for high packer prices related to both market supply and demand forces, as well as unusual events.
- The Ontario farm share of the retail beef value declined from about 41% to 39% over the research period. The packer share increased from 51% to 59%. For its part the retail share declined over that time from 8% to just 2%.
- Ontario cattle feeder margins have been generally consistent over the research period. The consistency, however, has been nearly constantly poor. Margins on feeding yearlings started the research period in 2016 very negative and recovered briefly in 2017. From that point, cattle feeding margins remained in a serious loss position.
- Ontario beef packer margins are estimated to have moved from normal levels in 2016-2018 to very profitable in 2019 and to exceptional profitability in 2020-2021. It is very important to note that the exceptional estimated margins were enjoyed by packers across North America, not just in Ontario.
- Retailers have not been fully passing along the increased beef cutout costs. Instead, retailer margins on beef have likely been shrinking over the past two years, at least.

One key take-away of this research is that unusual events such as the Tyson fire and COVID, in combination with basic supply and demand factors, contributed to the dichotomy between the beef cutout and the retail and farm price. Those in turn contributed to the changes in farm and packer share of the retail value. Those factors also of course generated the margin results at both the farm and packer level.

Another point of note is that, given the much slower rate of increase of farm prices compared to retail and packer, there is no basis to assert that farm prices are the cause of high retail prices. At the same time, however, there were also obvious reasons for high packer prices related to both market supply and demand forces as well as unusual events.

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1. Project Objectives and Methodology

1.1 Introduction

Consumer beef prices have increased significantly at retail in the last two years. Consumers are questioning why beef prices have become so expensive. At the same time farmers are concerned about their lack of profit and low, stagnating prices.

This project will provide Beef Farmers of Ontario (BFO) with an examination of the price and margin trends in the cattle and beef industry in Ontario. Its purpose is to assess the reasons and implications behind the pricing performance through the industry.

1.2 Objectives

To accomplish the project purpose, the following objectives must be completed.

1. Construct monthly price series data sets for retail, packing, feeding and cow-calf sectors of the industry in Ontario from 2016 to 2021.
2. Assemble an Ontario beef-cattle price spread model like the USDA Meat Price Spread data set.
3. Examine margins through the chain in Ontario.

Within the context of these objectives, BFO is looking for commentary/analysis on the trends over time and what that might mean for the marketplace. The time frame focus for this analysis is from 2016 through 2021. This will be referred to as the research period.

2. Pricing Through the Ontario Cattle and Beef Industry

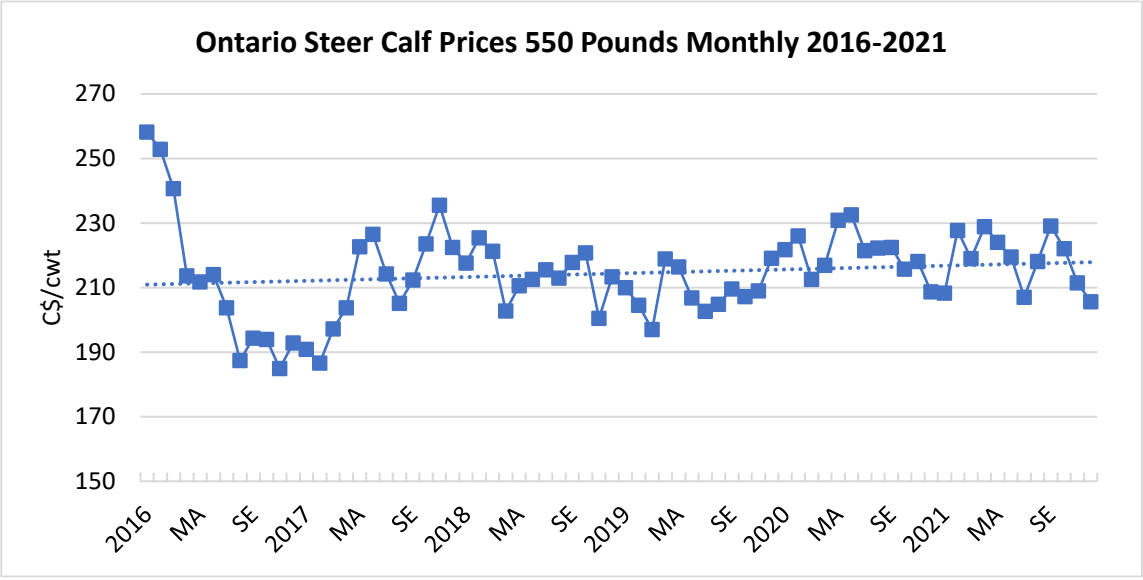
This section of the report looks at cattle and beef prices through the Ontario supply chain over the 2016 to 2021 period. It assesses the performance of calf, yearling, fed cattle and beef prices at the packer and retail level. The assessment of prices includes measures of rate of change, relationships between sectors and relative performance. Each sector is tabulated and assessed separately and then examined for relationships and comparisons.

The evaluation starts with calves at the beginning of the industry chain and then moves through the sectors to retail.

2.1 Calf and Yearling Prices

Ontario calf prices have trended in a sideways pattern from early 2017 through to 2021. Prior to that, calf prices were exceptionally volatile. Prices entered 2016 at a very high level as North American cattle prices were coming off record highs in 2014 and 2015. Those North American record high prices were caused by severe drought in the 2012-2013 period. The high prices were also caused by long-term herd liquidation. By 2016, herd rebuilding had begun in the United States and cattle prices worked lower. Due to the extreme volatility in the 2016-2017 period, this research assessment will also look at price changes between 2018-2021. This more recent period can provide perspective on more current events and does not include that 2016-2017 liquidation volatility.

Ontario steer calf prices began the research period in 2016 at well over $250/cwt. From that point prices rapidly declined to about $190 for the remainder of 2016 and early 2017. By the end of the research period in December 2021, prices ranged around $206.



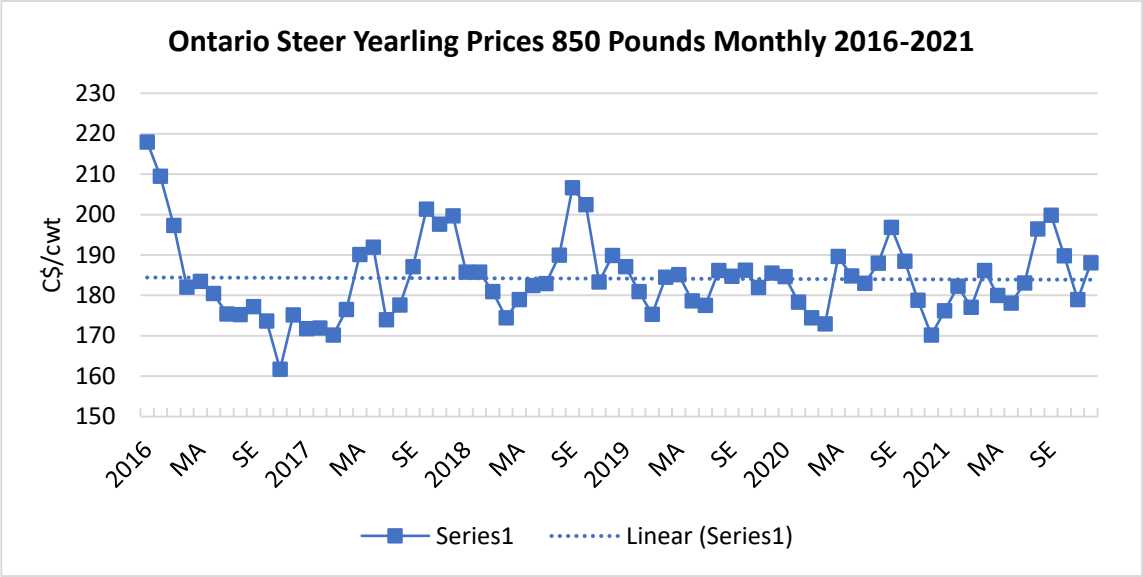
Source: BFO

The following points summarize the trends and movement of monthly calf prices in Ontario from 2016 through 2021. It also summarizes 2018-2021. The comparison is between the 2016 average compared to the 2021 average.

- Average value: $214
- 2021 average versus 2016 average: +2.8%.
- 2021 average versus 2018 average: +1.9%

Essentially calf prices have trended steady to slightly higher over the research period. Even if 2016 is ignored due to its volatility, the overall trend has been remarkably steady or stagnant.

Turning to yearling prices, the message is much the same. Yearling prices started the research period very strong, for the reasons cited above for calves. From that point, prices trended in a sideways pattern. If there was a modest uptrend in calves, that modest uptrend was entirely absent in the yearlings.



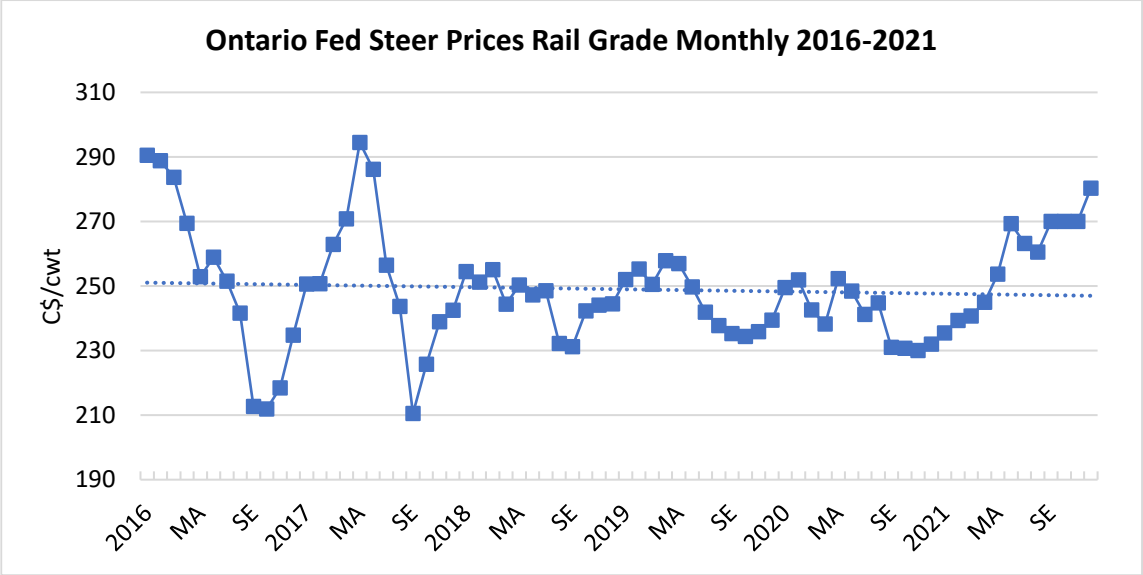
Source: BFO

The following points summarize the trends and movement of monthly yearling prices in Ontario from 2016 through 2021.

- Average value: $184
- 2021 average versus 2016 average: 0%.
- 2021 average versus 2018 average: -1%

2.2 Fed Cattle

While calves traded modestly higher and yearlings sideways, fed cattle were mostly steady to lower. The fed cattle trendline on the graph below is mostly sideways to lower over the 2016 to 2021 period.



Source: BFO

The following points summarize the trends and movement of monthly fed steer prices in Ontario from 2016 through 2021.

- Average value: $249
- 2021 average versus 2016 average: +2.7%.
- 2021 average versus 2018 average: +5.2%

Summary of Ontario Cattle Prices 2016-2021

The main point of note for each of the calves, yearling and fed prices over the research period is the sideways pattern of pricing. The overall price differential from beginning to end was lower, but the main takeaway was the horizontal price movement or drift. That is especially the case after the volatility of the 2016-2017 years. Pricing in Ontario flowed after 2017 within an obvious sideways channel without a notable trend higher or lower.

Sideways trading patterns usually represent a balance of supply and demand.

2.3 Ontario Beef Packer Prices

Prices at the packer level are the value amounts charged by the packer to their customers in the distribution, retail, foodservice, or export trade. These prices may be considered wholesale prices. The most common name for the aggregated or representative value at the packer level

at any time is the "cutout." The cutout is the weighted average value of all the beef cuts, primals and sub-primals sold by packers.

Choosing a Representative Ontario Cutout Value

Unlike cattle prices, there is no publicly available source of Ontario beef prices at the packer level. The closest there was in Canada to a beef price report for beef packing was the Canfax Boxed Beef Reports. Canfax collected and disseminated Canadian packer boxed beef prices with the cooperation of the beef packers in Canada. Agriculture and Agri-Food Canada (AAFC) was also a major participant and facilitator of the reports. Those weekly reports ran from the beginning of 2005 through March of 2020. There has not been a boxed beef price compilation report published since that time.

Those reports by Canfax and AAFC were similar in style and purpose to the USDA weekly report "National Weekly Boxed Beef Cutout and Boxed Beef Cuts." The Canadian report gathered and reported individual beef cuts and then formulated all the cuts back into a packer cutout value. The cuts and cutout were reported on an AA and AAA basis. The Canadian cutout value reflected the value of all the cuts on a carcass basis at the packer level, at the plant. This is exactly what is reported daily and weekly by the USDA.

For the purposes of this project, the USDA weekly cutout will be used as a proxy for the Ontario packer cutout value. The reason for using the USDA cutout is that the relationship between the Canfax cutout and the USDA cutout was statistically extraordinarily strong. The two cutouts moved in almost exact sequence. Furthermore, the nominal difference between the two cutouts was very small. Appendix A contains a detailed demonstration of why using the USDA as the Ontario cutout is appropriate and correct. The summary point of Appendix A is that given the near perfect statistical relationship between the USDA and the prior Canadian value, the USDA will be used as an obvious proxy for Ontario beef packer cutout values.

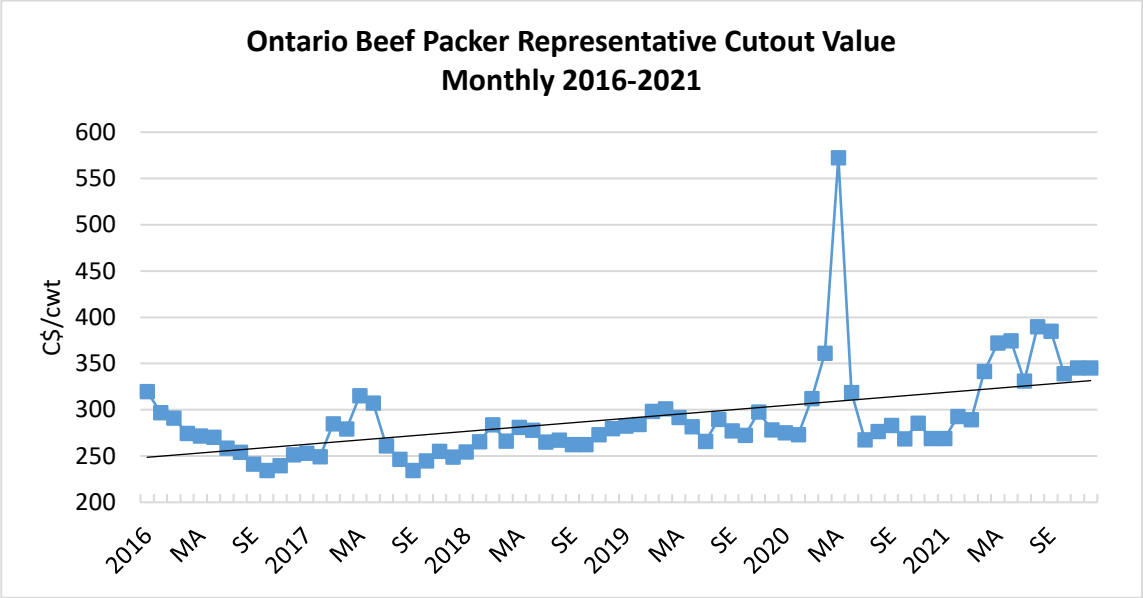
It is also important to note that Canadian beef packers and buyers, large and small, all utilize the USDA boxed beef cutout reports on a twice daily and weekly basis. The USDA reports are used in formula pricing, and they are used as a guide for spot market trades. Buyers are judged on how they purchase product relative to the USDA sheets. The USDA sheets are a pervasive part of the Canadian and Ontario beef industry for buyers and sellers.

For those quantitative and qualitative reasons, it is entirely appropriate to use the USDA cutout as a gauge of the direction, trend, and magnitude of the Ontario cutout.

Ontario Beef Cutout Price Trends

The performance of the representative Ontario cutout as shown on the graph below, is interesting for several reasons. As expected, and for the reasons noted above, the 2016-2017 period is volatile. From 2018 and 2019, however, the trendline was steady to higher. In early

2020, plants across North America were shut due to COVID. This severely restricted supply and caused prices to soar for a short period of time. Prices then fell back to the 2018-2019 pattern. In 2021 beef prices soared higher again. This time prices were driven higher on the strength of exceptional domestic and export demand for beef.



Source: USDA and Grier calculations

The following points summarize the trends and movement of monthly average of AAA/AA representative beef cutout prices in Ontario from 2016 through 2021.

- Average value: $290
- 2021 average versus 2016 average: +27%.
- 2021 average versus 2018 average: +25%

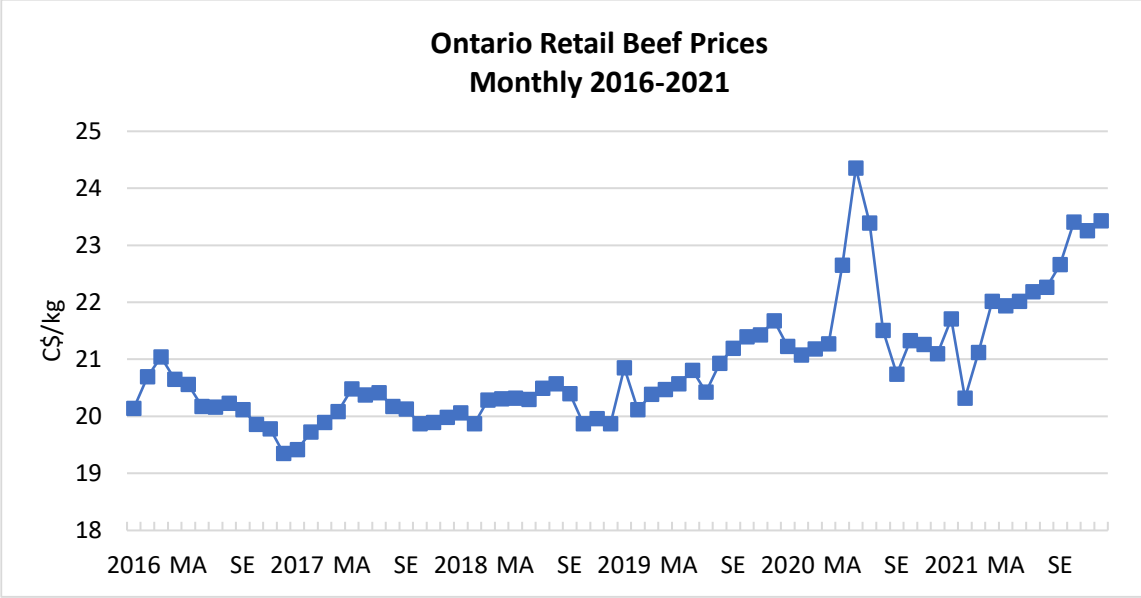
2.4 Ontario Retail Beef Prices

Statistics Canada's Consumer Price Index (CPI) is generated by surveying prices of a representative basket of typical consumer purchases. The key point is that these are prices consumers pay, mostly at retail. The prices of products within that basket are compiled and indexed. Included in that basket is a wide array of over 100 food product categories including meat. Included in the meat category for all of Canada are six cuts of beef including: round steak, striploin steak, prime rib roast, blade roast, stewing beef and ground beef.

The monthly CPI is generated for Canada as well as provinces and some cities.

The task here is to generate a representative retail beef price for Ontario. That will be accomplished by starting with the Canadian average retail beef value in the first month of 2016. From that point, that average will be indexed each month by the Ontario CPI beef index. That will provide a representative value of beef at the retail level in Ontario. For example, the average Canadian retail beef price for the six Statistics Canada cuts in January 2016 was $20.14/kg. That will be taken as a representative value for Ontario retail in 2016. From that point, the price will be adjusted month to month based on the Statistics Canada CPI for beef in Ontario.

The overall performance of the Ontario retail beef price looks similar to the overall trend for the prices at the packer level. There is the initial volatility in the 2016-2017 period, for the reasons discussed above: drought, liquidation, and slow rebuilding. In early 2020 there was an explosion in prices for the reasons discussed above associated with COVID plant shutdowns and declines in beef production. Then there is the surge in prices in 2021 which was caused by soaring prices at the packer level, largely due to demand.



Source: Statistics Canada Consumer Price Index and Average Retail Prices Monthly

The following points summarize the trends and movement of monthly average of retail beef prices in Ontario from 2016 through 2021 (through November, latest month).

- Average value: $20.84
- 2021 average versus 2016 average: +10%.
- 2021 average versus2018 average: +10%

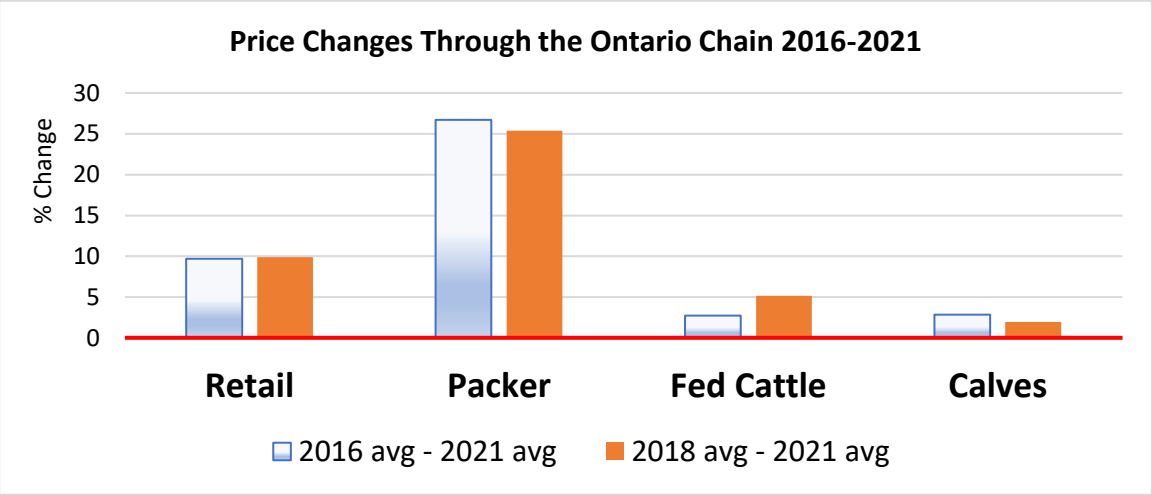
2.5 Prices Compared Through the Ontario Chain

This section compares the pricing results through the beef and cattle supply chain in Ontario. The focus of the cattle sector here is on the fed cattle and calves.

Price Changes 2016-2021

The first point is that there is a dramatic difference in the price changes through the chain from 2016-2021. The packing sector experienced material price gains over the period in question. Retail prices increased, but at a much slower rate. Fed cattle prices declined from 2016-2021 and had a modest increase from 2018-2021. Calves also declined from 2016-2021 and were flat between 2018-2021.

The graph below compares the 2016-2021 and 2018-2021 price changes through the supply chain for retail, packing, fed cattle and calves.

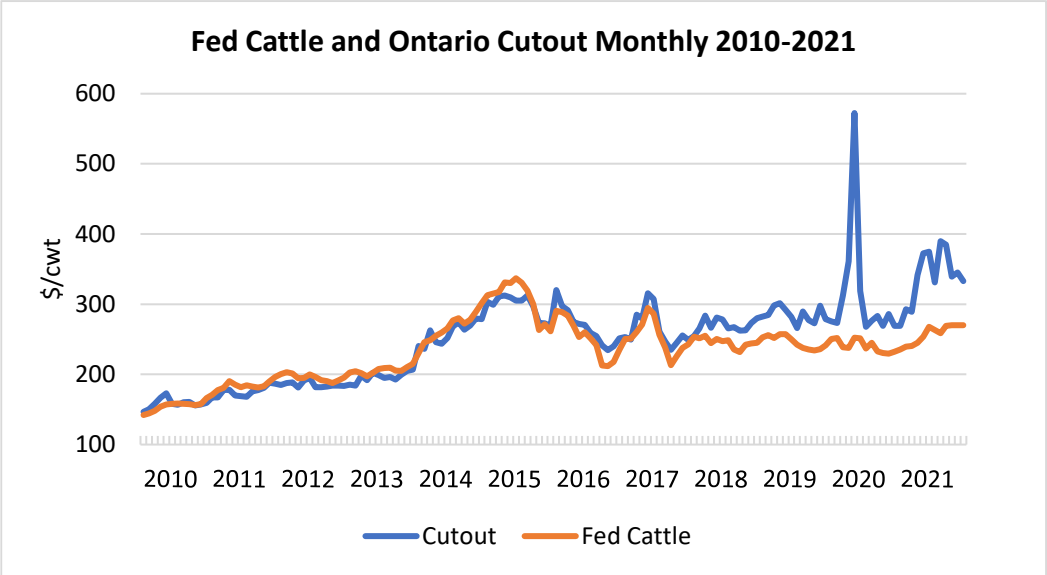


Source: Statistics Canada, BFO, USDA

Price Relationships 2010-2021

Given that the packer cutout had the biggest increase in prices over the research period, that price will be used as a benchmark. The task here will be to examine the cutout relative to the other parts of the chain.

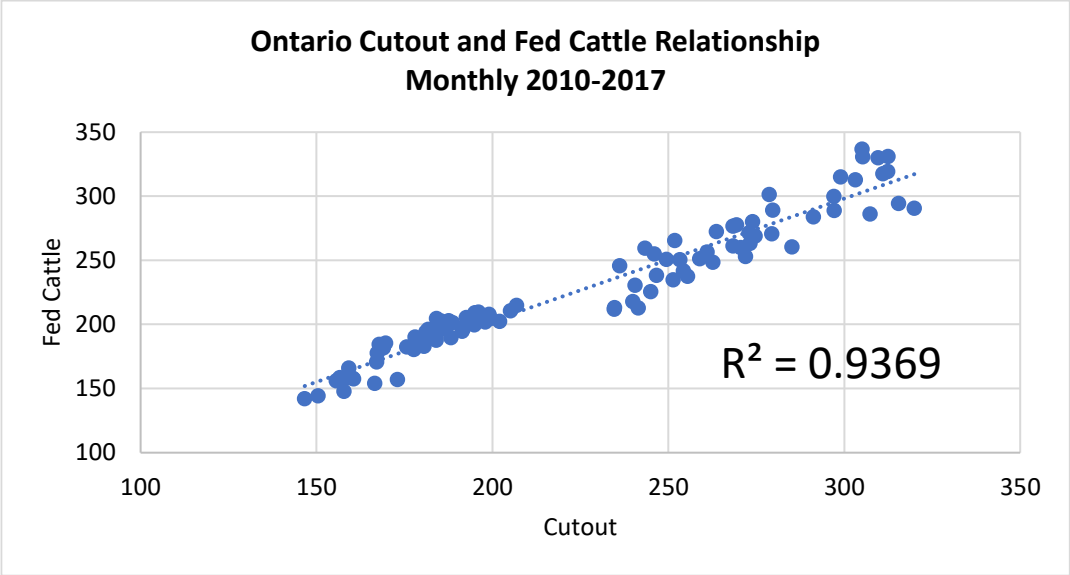
Regarding the cutout and fed cattle prices, it is instructive to take a longer term look at the relationship rather than just the 2016-2021 research period.



Source: BFO and USDA, Grier Calculations

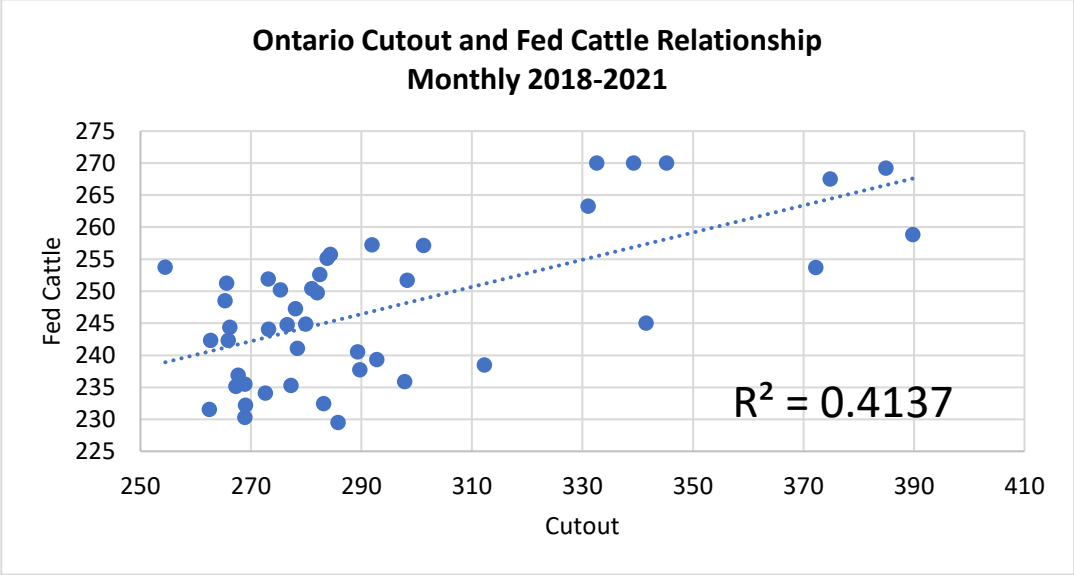
As can be seen on the graph above, there appears to be a very close relationship between the cutout and the fed cattle price from 2010 to 2017. There even appears to be very little nominal difference between the two values over that time. In fact, over that period, the fed cattle and cutout values were almost identical. That is in addition to the fact that they move together in a close pattern. By contrast from 2018 through 2021 there is a greater gap between the two price levels, and they do not trend together.

As can be seen on the graph below, from 2010 to 2017 there was a remarkably close statistical relationship between the Ontario cutout and fed cattle prices.



Source: BFO and USDA, Grier Calculations

Moving to the 2018-2021 period, the graph below shows that the statistical relationship significantly erodes. The graph shows the statistical relationship between Ontario fed cattle and the cutout, not including the unusual second quarter of 2020. That quarter was the COVID shutdown period which caused the cutout to soar to extraordinary levels.

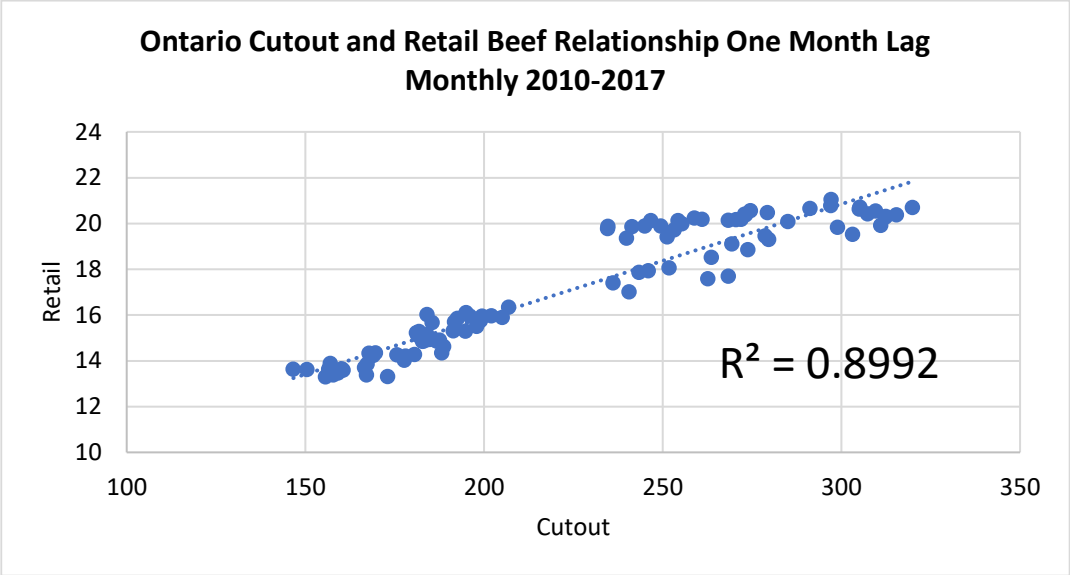


Source: BFO and USDA, Grier Calculations

Over that period, not including the second quarter of 2020, the fed cattle price averaged $247/cwt while the cutout averaged $294, a difference of $47/cwt. Again, that compares to no significant difference in 2010-2017.

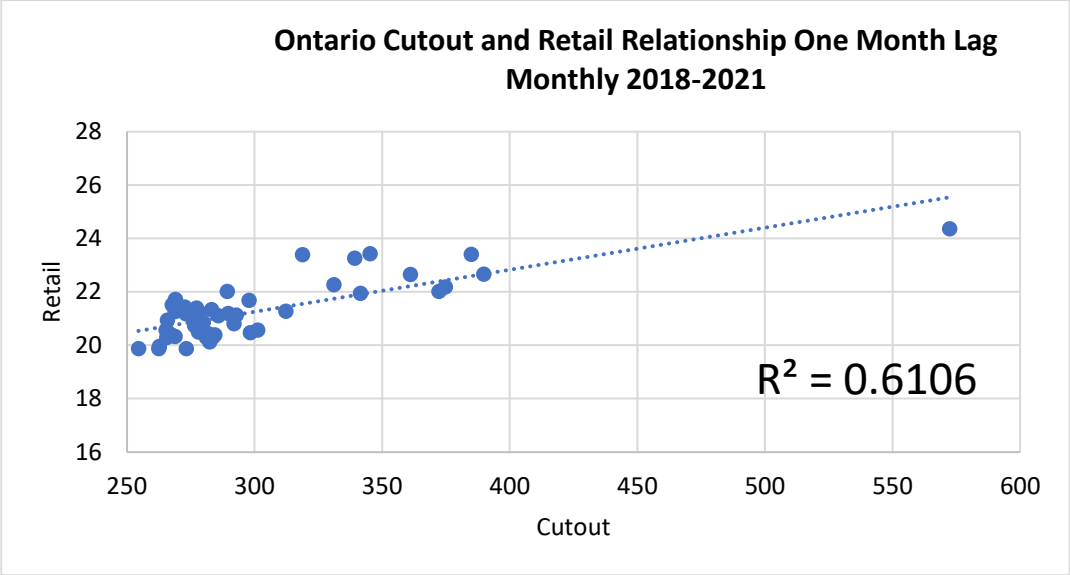
It is important to note that this is phenomena is not isolated to Ontario. The same disconnect between cattle and cutout is observable in the U.S. as well.

The relationship between the cutout and the Ontario retail beef price reveals similar patterns as the cutout and fed cattle. That is, from 2010 to 2017, there is a very close relationship between the two levels in the chain. The cutout-cattle relationship is stronger than the cutout-retail over that time, but cutout-retail are still very close from 2010-2017.



Source: BFO and USDA, Grier Calculations

From 2018 to 2021, there is still a statistical relationship between cutout and retail beef in Ontario, but it is not as close as in the prior period.

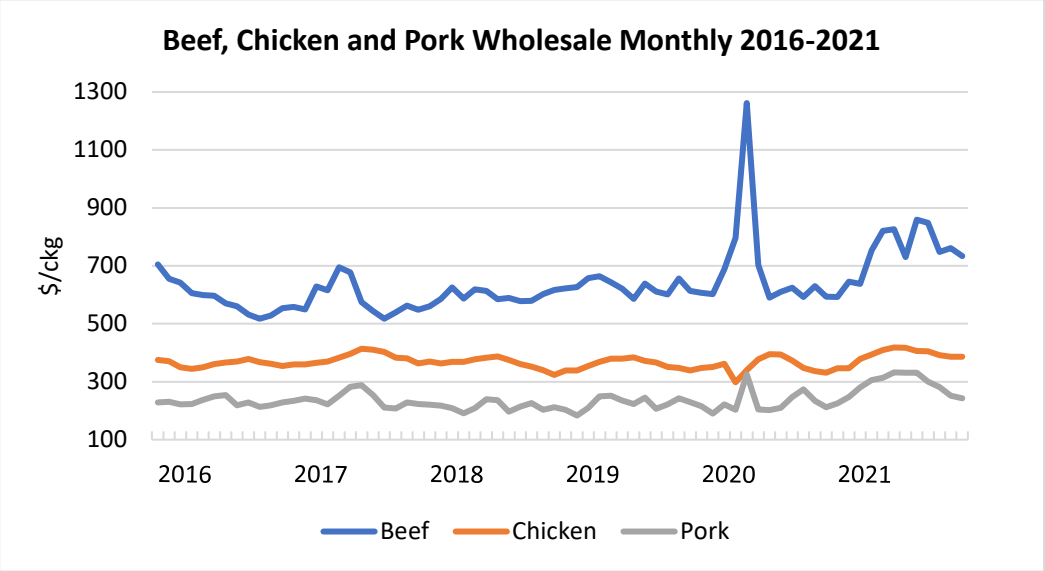


Source: Statistics Canada and USDA, Grier Calculations

2.6 Beef, Chicken and Pork

It is of interest to compare the price trends for beef, chicken and pork at the wholesale and retail level. This provides some perspective regarding the relative performance of beef versus the competing meats. Chicken Farmers of Canada collects chicken wholesale pricing at the processor level. For the reasons explained for beef, it is asserted here that the best representative price of wholesale pork or the pork cutout, is the USDA cutout in CAD$.

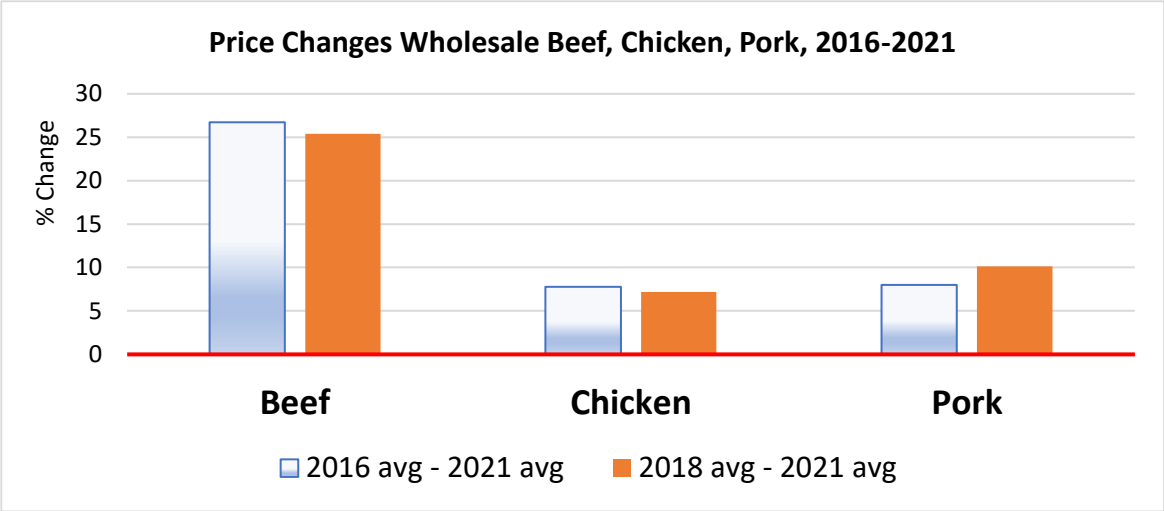
The following graph shows the monthly trend for beef, chicken, and pork at the processor/packer level in Ontario/Canada.



Source: Chicken Farmers of Canada (CFC), USDA and Grier Calculations

On closer examination of the correlations between the three main meats, it is shown that there is very little relationship on a month-to-month basis between beef and chicken. The price trends in the two markets are not related statistically. Beef and pork on the other hand have a closer statistical relationship. The closer relationship, however, does not necessarily mean that wholesale beef and pork are related to each other in terms of direction and trend.

With those general comments noted, the following graph shows the relative pricing performance of the three main meats over the research period.



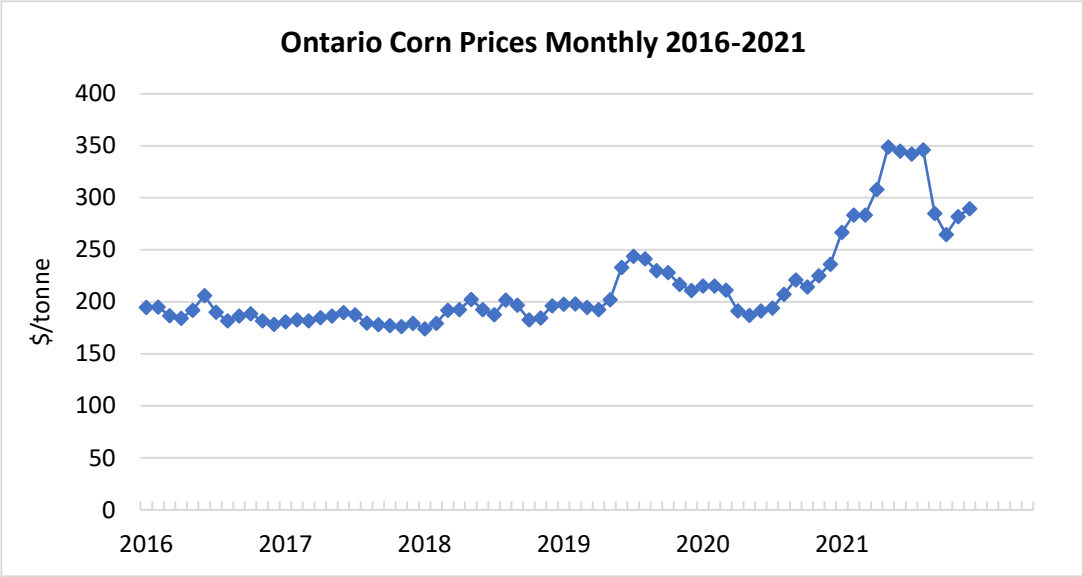
Source: CFC, USDA and Grier Calculations

Regardless of whether 2016 or 2018 is chosen as the starting point, the beef price increases through 2021 have significantly outpaced the competing meats.

2.7 Ontario Corn Prices

Corn is the most important cattle feeding ingredient in Ontario. Feed comprises about three-quarters of the cost of feeding cattle and corn is by far the largest of the feed ingredients. This section provides an overview of corn prices over the research period. Its purpose is to provide perspective on the direction of this most important component of the production process.

As can be seen on the graph below, Ontario corn prices were mostly steady from 2016 through to 2020. By 2021 prices surged sharply.



Source: Livestock Marketing Information Center

2.8 Comment and Discussion on Price Trends

Prior to 2018 there were very strong and predictable pricing relationships between the three main sectors of the beef industry in Ontario. After 2017 those relationships were broken. The main notable break was the surge in the packer cutout relative to both retail and cattle. The assertion here is that the following factors contributed to the disruption of the relationships.

1. Exceptionally strong North American beef demand, especially in the United States from 2019 to 2021. Beef demand in 2021 hit thirty-year highs. This would have given packers exceptional pricing leverage with beef buyers. For their part, retail, foodservice and distributor buyers aggressively bid up the price of beef at the packer level.
2. Very strong export demand. This would have provided pricing support to the cutout and would have reduced domestic beef availability.
3. Cattle supplies increased close to U.S. and Canadian packer capacity. This supply increase relative to demand would have placed downward pressure on cattle prices.
4. The Tyson Foods Finney County plant fire in the summer of 2019 was a major development. The one plant slaughtered about 6,000 per day representing about 5% of total capacity. This resulted in cattle being backed-up and significantly reduced the bargaining leverage of cattle feeders. This, in turn, had negative impacts on cattle prices across North American for most of the second half of 2019. On the other side of the equation, the reduction in production and the resulting concern among buyers resulted in very strong beef pricing.
5. The COVID plant disruptions during the second quarter of 2020 resulted in huge losses of production capacity for days or weeks at a time. This, in turn, resulted in cattle being backed-up and backlogged for the rest of 2020 and into the first quarter of 2021. In

fact, for most of 2021 the number of cattle on feed for 150 days or more was at or near record levels. That in turn resulted in supplies that were often in excess of capacity in 2021. Cattle feeders were in a constant defensive position regarding marketing and pricing. Regarding packer pricing, the COVID disruptions caused beef prices to surge to incredible heights.

The main point is that unusual events such as the Tyson fire and COVID, in combination with basic supply and demand factors, contributed to the dichotomy between the beef cutout and the retail and farm price.

Another point of note is that, given the much slower rate of increase of farm prices compared to retail and packer, there is no basis to assert that farm prices are the cause of high retail prices. At the same time, however, there were also obvious reasons for high packer prices related to both market supply and demand forces as well as unusual events.

3. Beef Price Spread Farm to Retail

This section of the report provides a rough measure of the packer, grocer, and cattle feeder share of the total retail value of beef. In addition, it provides estimations of three price spreads: farm-wholesale, wholesale-retail, and farm-retail. Its purpose is to demonstrate the magnitude of the spreads in Ontario and see how the shares have changed over the research period, 2016-2021.

3.1 Background

Meat Price Spreads

A price spread is the difference between the cost of an item at one stage of the marketing channel and a different stage. As noted in the 2004 USDA Economic Research Service (ERS) report entitled, Beef and Pork Values and Price Spreads Explained, "the farm-to-retail price spread is the difference between the value of an animal at the farm and its value at the grocery store." The ERS has developed a widely used and cited Meat Price Spreads model which it updates monthly.

As a further point of explanation, The Center for Agricultural and Rural Development paper entitled Measuring Price Spreads in Red Meat says that price spreads are the difference between prices at different stages of the supply chain. The wholesale-to-retail spread is the difference between the wholesale price and the retail price. The farm-to-wholesale spread is the difference between the wholesale price and the net farm price (net farm price is the gross farm price minus the value of byproducts per unit). The total spread is the sum of the farm-wholesale and wholesale-retail spreads, which can also be calculated by subtracting the net farm price from the retail price.

In the beef industry, the "wholesale" price is the packer price best represented by the cutout, as discussed in section 2.3.

This section of the report examines Ontario-centered beef price spreads, as defined above. The analysis, format and methodology are based on the USDA Economic Research Service (ERS) Meat Price Spreads model (https://www.ers.usda.gov/data-products/meat-price-spreads/).[1] This assessment simply uses the ERS model and assumptions and applies them to Ontario-based prices. For this project, the adoption of the USDA model uses Ontario beef CPI, Ontario cattle prices and the Ontario cutout as defined in section 2.3. The Appendix contains an explanation of the methodology for implementing the ERS model in the Ontario industry.

3.2 Ontario Beef Price Spreads

As a starting point it is important to note that these spread results are broad-based guidelines. The results provide a rough guide of the sector shares in Ontario. Any given retailer and packer combination in Ontario would likely generate entirely different results. These spreads are the result of the entirely defensible adoption of the ERS model in the Ontario market. The resulting spreads are a suitable guide as to the market situation. The primary goal is to show the trend in the spread between 2016 and 2021.

With those warnings and caveats noted, the table below shows the Ontario beef prices spreads and shares for beef at retail, based on the ERS modeling.

Ontario Beef Price Spreads Annual Average 2016-2021

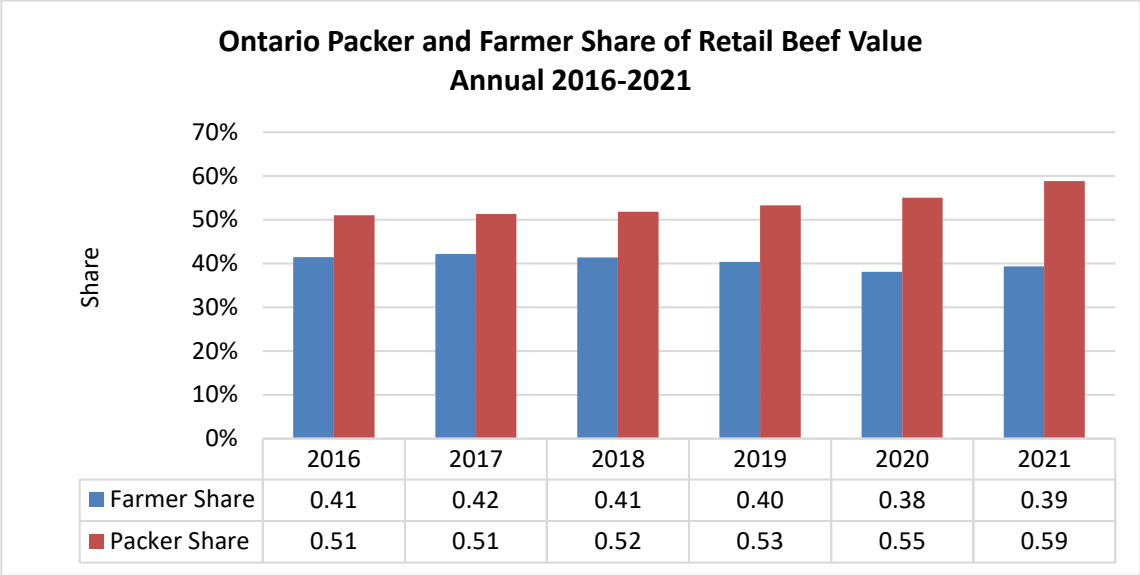
	Retail Basis Value Cents/Pound					Beef Spread Cents/Pound			Sector's Share	
	Retail Value	Wholesale Value	Gross Farm Value	Byproduct Allowance	Net Farm Value	Total Spread	Wholesale to retail	Farm to wholesale	Farmers' share	Packers' Share
2016	790.5	403.3	361.7	34.1	327.6	462.8	387.2	75.7	0.41	0.51
2017	782.9	401.6	363.8	33.4	330.4	452.5	381.3	71.2	0.42	0.51
2018	789.0	408.6	353.8	27.4	326.4	462.6	380.4	82.2	0.41	0.52
2019	814.9	434.2	354.1	25.2	328.9	485.9	380.6	105.3	0.40	0.53
2020	850.1	467.6	346.4	22.3	324.1	526.0	382.5	143.5	0.38	0.55
2021	867.1	510.2	371.5	30.2	341.3	525.8	356.9	168.9	0.39	0.59

Source: BFO, USDA and Grier Calculations

The table shows that over the research period, the total spread between the farm and the retail has increased from $462.8 cents per pound to $525.8 cents per pound. Over that time, the farm share has decreased from 41% of the retail value to 39% of the retail value. The packers' share of the retail value has increased from 51% to 59%.

[1] The ERS publication, Beef and Pork Price Spreads contains a more detailed explanation of the model and price spreads. It can be found at https://www.ers.usda.gov/webdocs/outlooks/37369/49585_ldpm11801.pdf?v=501.2

Although not shown on the table, the implication is that the retailer's share of the total retail value has been declining over the research period. The retailer's spread starts in 2016 as about 7-8%, but it declines in 2021 to just over 2%. Given the relative stability of the farm share, the implication is that the packer price increases have eroded the retailer share.



	2016	2017	2018	2019	2020	2021
Farmer Share	0.41	0.42	0.41	0.40	0.38	0.39
Packer Share	0.51	0.51	0.52	0.53	0.55	0.59

Source: BFO, USDA and Grier Calculations

3.3 Comment and Discussion on Ontario Beef Price Spreads

The spread results are entirely consistent with the price trends in Section 2. Packer prices rose dramatically. Retail prices did not increase near as much. As a result, the packer share of the retail value increased notably. The Ontario farm share was surprisingly steady to lower. The surprise is that it did not decline more given the pricing patterns. It appears that retailer share eroded rather than the farmer share. Nevertheless, the spread data does demonstrate that the increase in beef prices is not due to cattle farm price increases.

4. Ontario Cattle, Packer and Retail Beef Margins

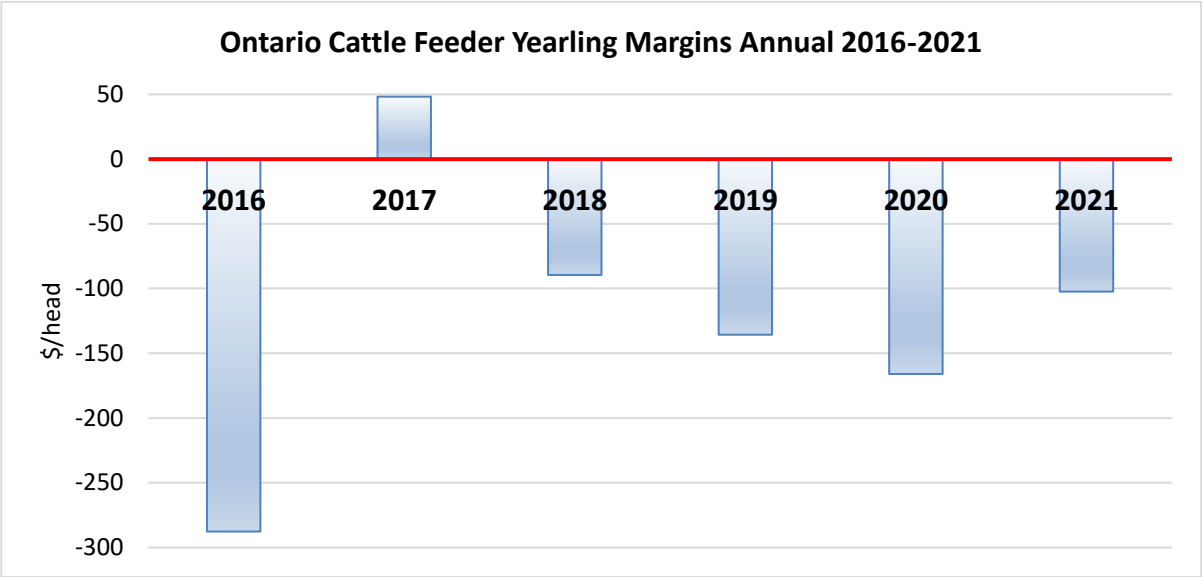
This section of the report provides estimates of profit margins for Ontario cattle feeders and packers from 2016 to 2021. The purpose is to demonstrate the impact of the pricing trends on Ontario industry margins.

4.1 Ontario Cattle Feeder Margins

Cattle feeder margins are driven by fed cattle prices, feeder cattle costs, feed costs, and operating costs such as labor and animal health products and services. Cattle feeding margins are the difference between the price received for the fed cattle and the total costs of feeder cattle, feed, and operating costs. Of these costs, fed cattle, feeder cattle and feed are most important or greatest.

As can be seen in section 2.2, over the research period 2016-2021, fed cattle prices have been steady to lower. Feeder cattle pricing in Ontario has been mostly steady to higher for both calves and yearlings. Also, of note in section 2.7 is that corn prices have been steady from 2016 through 2020 before increasing dramatically in 2021.

The net result of the tabulation of the revenues and costs is that Ontario cattle feeder margins have been generally consistent over the research period. The consistency, however, has been nearly constantly poor. Margins on feeding yearlings started the research period in 2016 very negative and recovered briefly in 2017. From that point, cattle feeding margins remained in a serious loss position. Over the research period Ontario margins averaged about $122/head in the red.



Source: Graeme Hedley

It is important to note that Alberta cattle feeding margins, as measured by Canfax, were very similarly poor to those of Ontario. As a further point of reference, Iowa State University estimations of 2016-2021 average cattle feeding margins in that state were also negative.

4.2 Ontario Beef Packer Margins

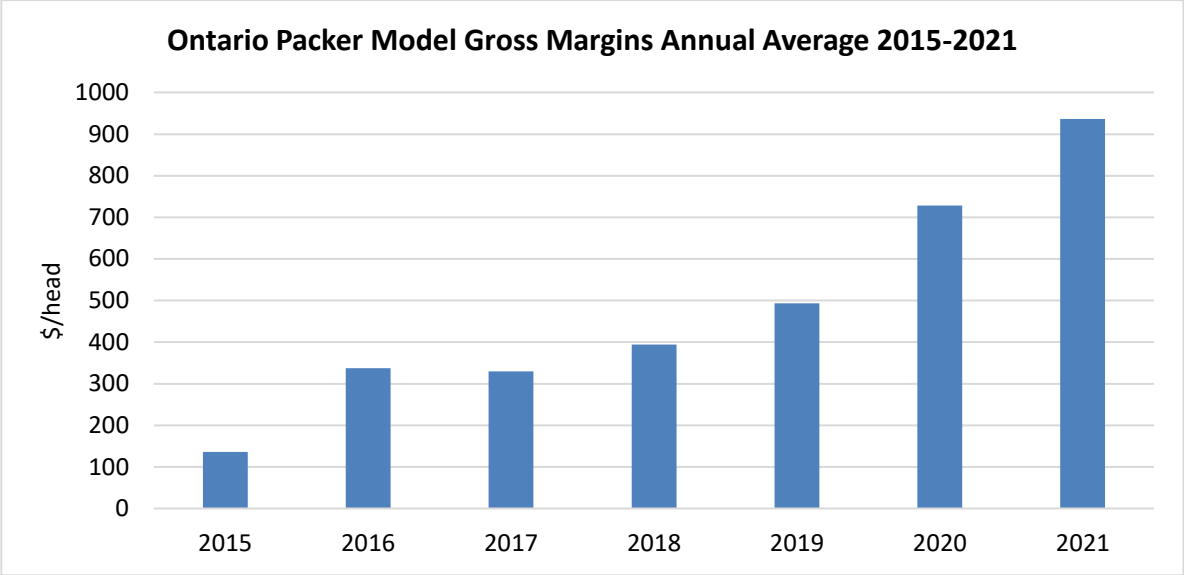
Beef packer margins are comprised of the revenue from the beef sold and the by-products. The returns from beef sold are represented by the cutout value, as discussed above in section 2.3. The cutout value is multiplied by the shrunk carcass weight to derive the beef revenue. The by-products are a much smaller share of the packer revenue but are very important. By-product revenues are derived from sales of the hide and other co-products such as tallow, tongues, tripe, and many other items of value. The USDA publishes a by-product or drop value report

daily. For these purposes, that value will be utilized, but discounted by 4% to represent likely Ontario values.

On the cost side of the margin equation, the largest component by far is cattle cost. Of the non-cattle costs, labor is most important followed by packaging, energy, and overhead/administration.

Gross margins in beef packing can be estimated by the total revenue from beef and by-products on a per head basis and subtracting cattle costs. The gross margin does not include the operating costs for slaughter and fabrication to boxed beef.

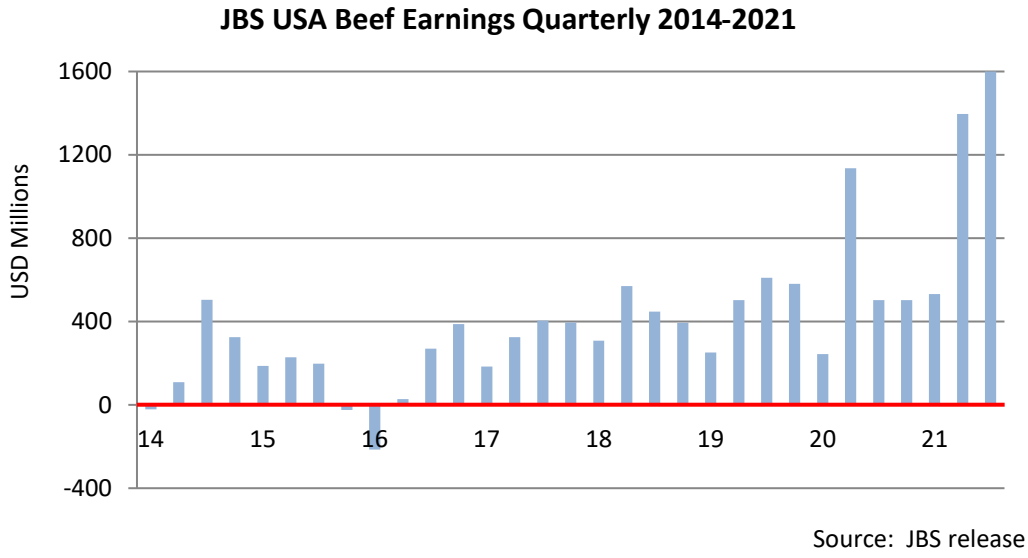
With that definition in mind, the following graph shows the estimated gross margins before operating costs for a model Ontario packer.



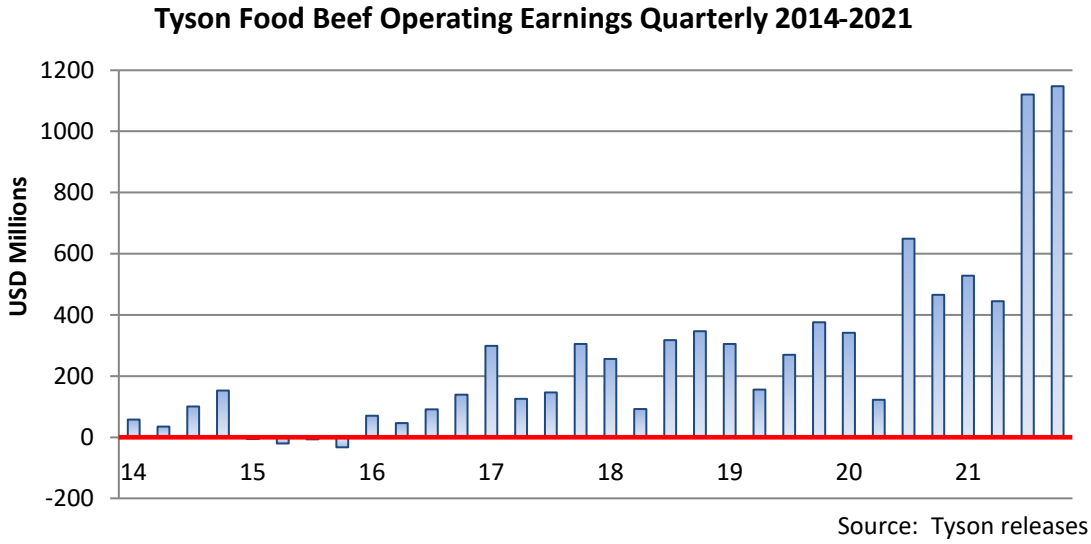
Source: USDA, BFO and Grier Calculations

The year 2015 is provided for context. In that year as well as 2014, cattle costs were exceptionally high for the reasons discussed in section 2.1. That year would have seen packers in Ontario is a serious loss position. The years 2016-2018 were likely considered normal years in terms of historic margins. Those years likely would have generated narrow positive profit margins. By 2019, however, the data indicates that packers became very profitable and by 2020 and 2021 estimated margins reached extraordinary levels for a model Ontario packer.

It is very important to note that the exceptional margins were enjoyed by packers across North America, not just in Ontario. As noted on the graphs below, both JBS USA and Tyson enjoyed exceptional returns for beef operations especially in 2021.



Source: JBS release



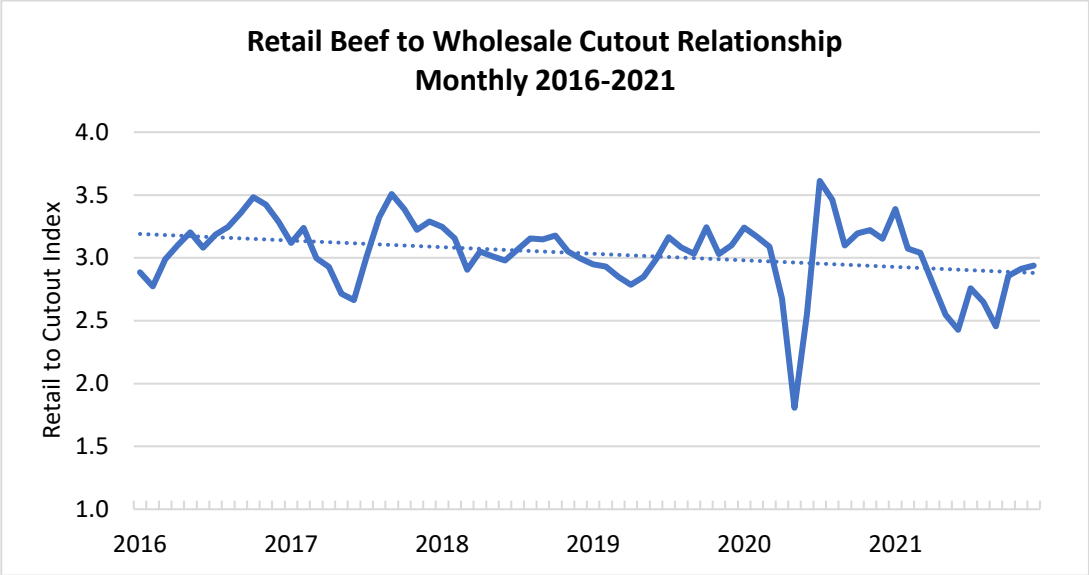
Source: Tyson releases

4.3 Ontario Retail Margins

Retailer margins may be estimated by looking at retail beef prices and comparing to the wholesale cutout costs. This does not show whether retailers are profitable on beef or not, but it can provide context over time. Another way to gauge retailer margins would be to access the spread model in section 3.

Retail Beef Value to Wholesale Cutout Value

Given the cutting and yield losses as well as the fact that not all the cutout is sold at retail, simply comparing the spread between the cutout and the retail value can be misleading. As such, for this effort, the two values will be related in a ratio index.

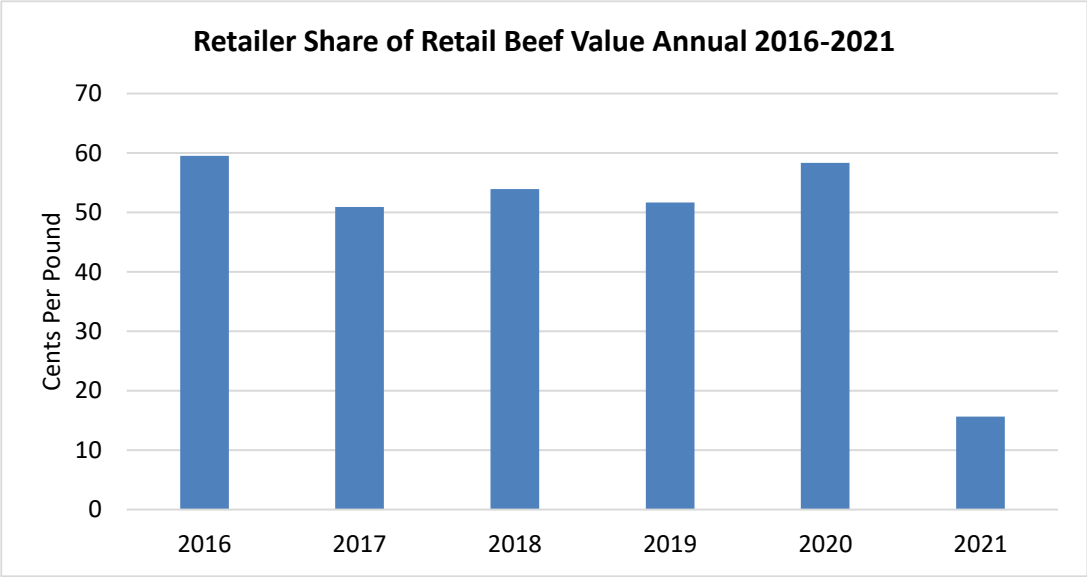


Source: Statistics Canada, USDA and Grier Calculations

This method shows that over the research period, the ratio of the retail value to the cutout has been steadily declining. In 2021 the retail value versus the cutout declined to far less than the long-term average relationship. This does not say whether beef at retail is profitable or not, it simply means that the retail value is declining compared to the cutout. Therefore, it can be logically inferred that beef margins have been declining at retail over the research period.

Retailer Share of Retail Beef Value

The spread model in section 3 can be utilized to gauge how much of the retail value of beef goes to the retailer versus the farm or packer. Based on the model it appears that the value retained by the retailer in Ontario declined sharply in 2020 and 2021.



Source: USDA, BFO and Grier Calculations

This result is consistent with the spread results which showed that the packers' percentage share had increased markedly over the 2020 and 2021 period. The implications are that retailers have not been passing along the increased cutout costs. Instead, retailer margins on beef have likely been shrinking over the past two years, at least.

4.4 Comment and Discussion on Ontario Beef Supply Chain Margins

As with the spread, the margin results for farm to retail are not surprising based on the pricing performance discussed in Section 2. Ontario farm margins have been pressured lower and into a loss position due to high grain prices and steady to lower cattle prices. Ontario cattle feeders have been in a near consistent loss position through most of the research period.

This research project is unable to make conclusive statements about retailer profitability. With that noted, however, it can be demonstrated that retailer margins must have been under sharp downward pressure during the past two years or at least in 2021. This, again, is consistent with retail prices increasing at a slower pace than beef costs, as represented by the cutout.

Ontario packers, on the other hand, have benefited from very strong beef demand which pulls the cutout very high. They have also gained from market-driven supply-demand and unusual circumstances which have pressured cattle prices lower. The combination of the beef price increases, and the cattle price stagnation resulted in exceptional margin performance. This has been the case for beef packers across North America.

Kevin Grier

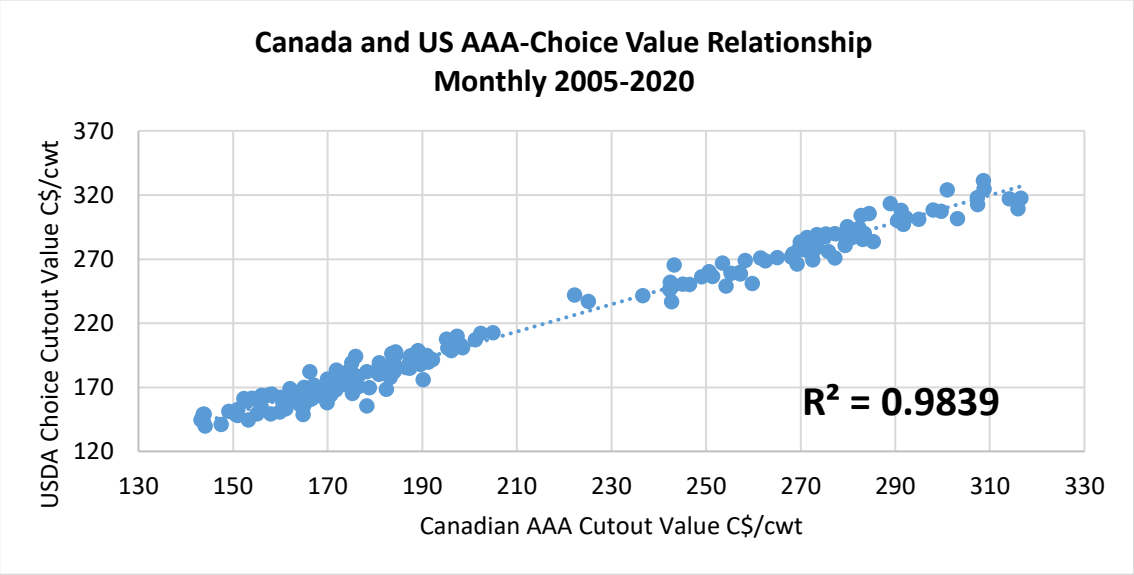
January 2022

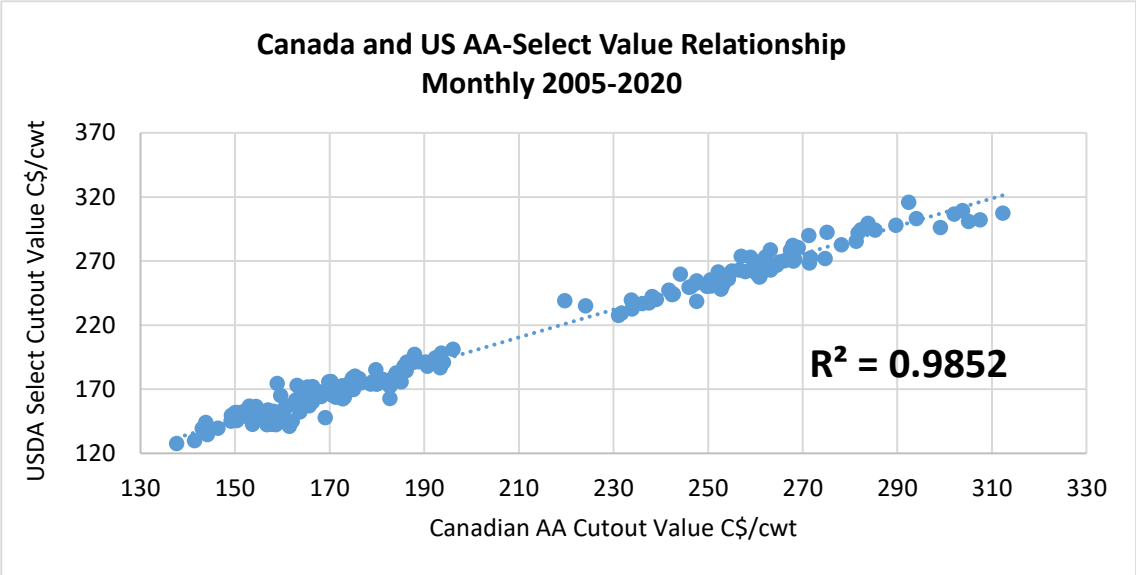
Appendix A

Rationale for Using the USDA Cutout as the Ontario Cutout

The rationale for using the USDA cutout as a representative model for Ontario is outlined below:

- There was nearly a one-to-one statistical relationship between the values of the USDA Choice and Select cutouts and the Canadian AAA and AA cutouts. The R-squared or Coefficient of determination monthly between 2005 and early 2020 was over 98%. That is, about 98% of the variation in the Canadian value can be explained by the U.S. value. That is an extraordinarily strong relationship between the two variables. It can be visually seen on the two graphs below.





Source: USDA and Canfax/AAFC

The following are other interesting statistical outcomes of the comparison between the Canadian cutout and the USDA data over the 2005 to 2020 period.

- The AAA-Choice spread averaged C$-3.68/cwt over that 2005-2020 period. That is, the Canadian AAA average C$3.68 less than the USDA Choice. The AA-Select spread averaged C$-0.07/cwt; there was very little difference between AA and Select.
- The combined spread of AAA/AA minus Choice/Select was C$-1.87/cwt. That is a very small difference when considering the average values were about C$210/cwt.
- The ratio of the combined AAA/AA cutout to the combined Choice-Select cutout was 0.996. That is the combined AAA/AA cutout was almost exactly equal in value share to the combined USDA Choice/Select.

The Canadian cutout would be weighted toward Alberta plants. This is given the magnitude of production in Alberta compared to Ontario. With that acknowledged, there is no reason why the Ontario cutout would differ materially from the Canadian Canfax quote. If there was an Ontario-only cutout, it would likely be modestly higher than the total Canadian because the Canadian cutout is FOB the plant. The greatest share of the Canadian market is in eastern Canada. As such, Ontario packers would have a transport advantage. Nevertheless, the Canadian cutout is clearly representative of the Ontario market, just as the USDA cutout is a good representation of the Canadian cutout.

Appendix B

Assumptions and Methods of Utilizing the USDA Meat Price Spreads Model

ERS Definitions

Retail value: The value of a weighted average of an animal's retail meat cuts measured in cents per pound.

Wholesale value: Average value of the meat as it leaves the packing plant, measured in cents per pound of retail weight.

Gross farm value: Value of the animal when it is sold, measured in cents per pound of retail weight.

Net farm value: Gross farm value minus the value of byproducts; represents the value of the meat to the farmer.

Byproduct allowance: Value of hides, skins, fats, bones, and edible and inedible offal.

- The ERS model estimates the farm value on a retail basis as the fed cattle price times a factor of 2.4.
- The wholesale value on a retail basis is the cutout times a factor of 1.52-1.54.

Note that the development of these conversion factors is based on extensive analysis of cuts sold at retail, yields, weight and other parameters. In addition, the retail value is based on research into those cuts sold at retail, the weights sold, yields and then converted to a retail basis measured in cents per pound.

Ontario Adoption of ERS Model

This project does not construct an Ontario or Canadian meat price spread model. It adopts and implements the USDA model.

Retail Value

As a starting point, this research assumes that the ERS retail value structure and format is similar in Canada/Ontario as in the United States. This is a reasonable assumption. It is true that there will be differences between Canada and the United States retailer merchandising. That, however, is the case between retailers within Canada. The main point is that Canadian and U.S. retailers each merchandise broadly similar beef products from very similar grain fed cattle.

It also assumes that the Ontario and U.S. retail values are similar in 2016, the starting point of this spread analysis. This is also a reasonable assumption. Research for this project into five similar cuts in Canada and the United States in 2015 and 2016 revealed remarkably close

average results in Canadian dollars. Once that 2016 starting retail value is made, it is changed from 2017-2021 based on the Ontario beef CPI.

Wholesale value

Based on the analysis outlined in this report, the USDA model wholesale value is utilized as the Ontario value. It is reduced, however, by 4% to reflect Canadian value, as noted in this report.

Farm value

The farm value is the Ontario cattle price on a retail basis (multiplied by 2.4).

By-product allowance

This model uses the ERS value, reduced by 4% to reflect Canadian value.