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The Two-stage Cattle Cycle in Canada

INTRODUCTION

A cyclical pattern of supply and demand in livestock markets was first observed in the 1920s by the American agrarian economist Mordecai Ezekiel. In the beef industry, this pattern is called the cattle cycle: a repeating series of herd expansion, peak, liquidation and consolidation.

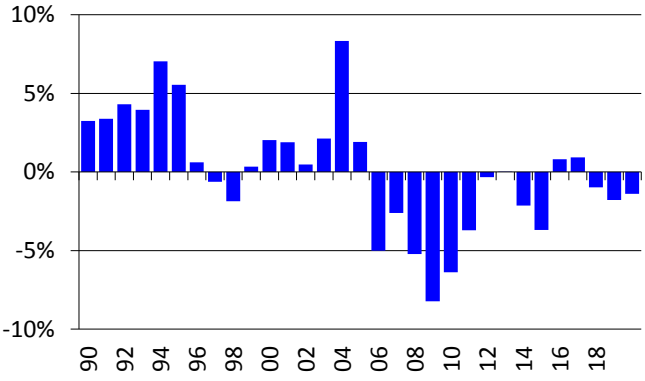
The cycle begins when beef demand moves higher before livestock supply catches up. As a result, prices paid for beef at retail and wholesale increase. High beef prices incentivise processors to pay more for fed cattle. High fed cattle prices incentivise feedlots to pay more for feeder cattle. High prices for feeder cattle signal cow-calf operations to expand, increasing the supply of livestock. It takes up to three years for livestock supplies to meet demand due to the biological lag. The biological lag is the time it takes to breed a cow and have its calf reach the slaughter market. The supply of livestock will eventually meet then exceed demand. When livestock supplies saturate the market, the price of beef drops, sending signals to tighten livestock supply again. This cycle of consumption and production typically lasts about ten to twelve years. This cycle impacts the entire supply chain, with implications for profitability at each stage.

From bottom to bottom, it could be argued that the last cycle went from July 2002 to 2015 (13 years) with a slight increase seen in beef cow numbers in 2016 (+0.8%) and 2017 (+0.9%) before continuing liquidation. The decline has persisted even with rising beef demand, counter-intuitive to what the market would suggest. This has created conditions for a two-stage cycle while the cow herd remains stable and feeding operations began expansion in 2015.

PART I: THE COW HERD IN LIQUIDATION

Beef cow inventories provide an indication of producer's breeding decisions as they respond to market signals. Beef cow inventories typically move into an expansion phase when there are higher prices for feeder cattle and when demand is strong and supplies are tight. Between 2016 and 2020, Alberta 550 lb steer prices averaged $220/cwt, up 55% from the 2009-2013 average of $142/cwt – giving a clear signal of strong demand in the last five years. The proportion of beef cows in the total herd is slow to respond, with a lag typically seen from when the first price increase occurs (seen in the fall of 2014) and when inventories start increasing. There has been ample time for Canadian cow inventories to adjust to increased demand.

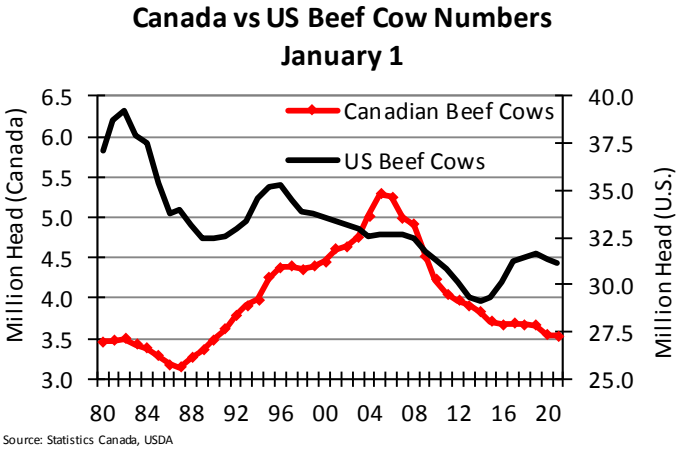
Canadian Beef Cow Inventory
July 1



Source: Statistics Canada

The Canadian beef cow herd went through a liquidation phase between 2005 and 2015. Beef cow numbers declined 30% from 5.3 million head January 1, 2005, to 3.7 million January 1, 2016. Between 2016 and 2019, it looked promising that liquidation had slowed and consolidation in the Canadian beef cow herd was underway; this was the case in the U.S. as beef cow numbers increased 9% or

2.6 million head from January 2014 to January 1, 2019. The U.S. herd has since begun to liquidate and was down 1.7% or 530,000 head between January 2019 and January 2021. U.S. beef cow inventories are still 2 million head larger than in January 2014. In contrast, Canadian beef cow numbers continued to decline after 2018. By January 1, 2021, beef cow inventory in Canada was down 6% or 90,000 head below 2014 levels; the opposite of what was expected and what happened in the U.S.



Source: Statistics Canada, USDA

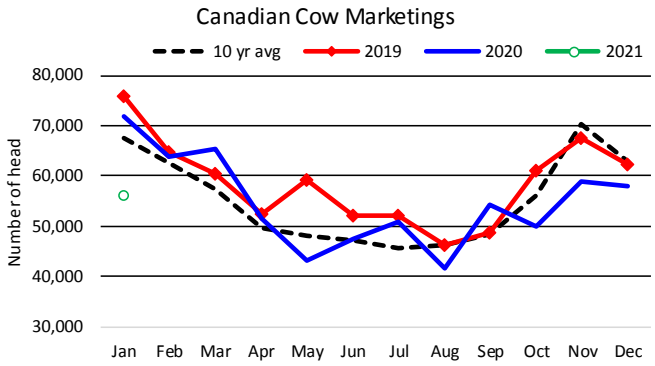
It is expected that as pounds produced per cow increase, the changes in the cow herd will be smaller than what was seen historically. Fewer cows are needed to meet or exceed demand signals today. If counting the modest increases in 2016 and 2017 as the current cycle's expansion phase, then liquidation has been just as modest over the last three years with inventories down 4% or 155,000 head between 2017 and 2020. In 2021, the Canadian beef cow herd is arguably in its fourth year of liquidation.

Cow marketings

Cow marketings provide an indication of production decisions when considered alongside heifer retention. Lower marketings and higher retention signal potential for the cattle cycle to trend up. In 2020, cow marketings were below 2019 and the 10-year average. The beef cow culling rate dropped to 10.7% in 2020, to be just below the 20-year liquidation rate at 11%. This is the third consecutive year of decline in the culling rate.

Processing disruptions due to COVID-19 may have impacted cow marketings as fed cattle were prioritized at the slaughter plants, increasing the supply of available beef for grinds and non-fed live exports to the U.S.

Total Canadian cow marketings in 2020 were 644,919 head, down 8% from 2019 and down 3% from the 10-year average. Domestic cow slaughter was down 18% and slaughter cow exports were up 28%. While there were fewer marketings in 2020, there were also fewer beef cows in the inventory.



Source: Statistics Canada, CBGA

In January 2021, total cow marketings were down 22% from January 2020 at 55,949 head, and down 17% from the 10-year average. If non-fed marketings continue to trend below the 10-year average, it could result in a larger cow herd by July. However, for the herd to expand at this stage, more heifers need to be retained as replacements as well.

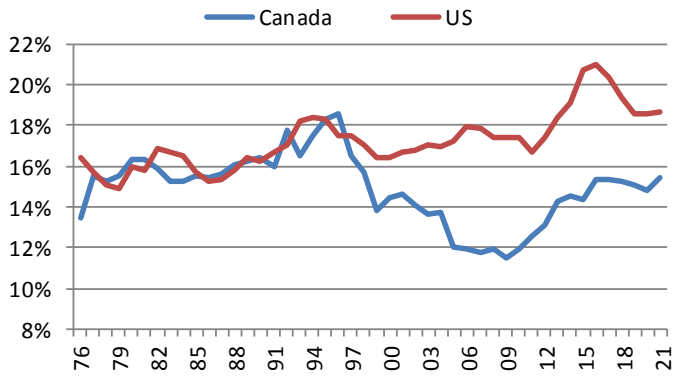
Heifer retention

From 2010 to 2012, breeding stock were at their lowest numbers since 1987. In 2013, the number of heifers retained grew 7.5%, a sign of expansion that only lasted one year. Heifer retention then fell from 2013 to 2015. Heifer retention spiked again in 2016 but then declined until 2020. The number of replacement heifers as part of the breeding herd increased for the first time in four years on January 1, 2021, by 4.1% to 5.4 million head.

Heifer retention as a percentage of the cow herd increased from 14.8% in 2020 to 15.4% in 2021. In Canada this percentage increased from 2009 through 2016 as beef cow declines outpaced declines in replacement heifers. The percentage has been relatively steady since. In contrast, the U.S. percentage grew sharply from 2013 through 2016 during their expansion phase. The modest

replacement heifer numbers indicate Canadian producers are not expanding the herd.

Replacement Heifers Relative to Cow Numbers

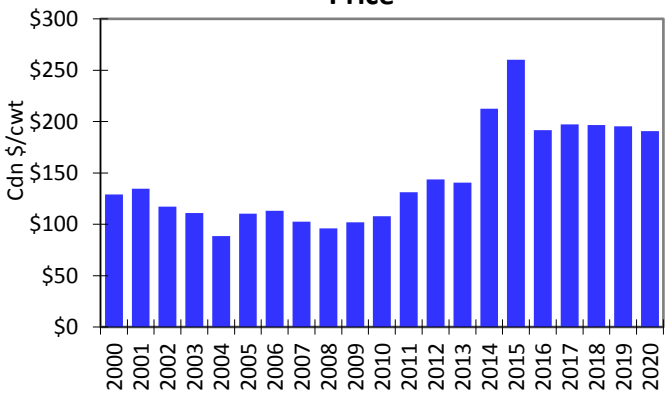


Source: Stats Can, USDA , Canfax

Feeder Prices

A number of factors affect any operation's decision to liquidate or expand its beef cow herd. The price for feeder cattle is just one factor to consider. Current prices play less of a role than the expectation for future prices. For example, as international beef demand jumped 27% from 2013 to 2014, feeder prices moved up as well. As international beef demand increased another 12.7% in 2015, feeder prices moved even higher. Still, there was not enough confidence for producers to decide to expand their herds. Historically, several years of sustained demand have been required to provide confidence to expand, as seen during the post-war period beginning in 1946, and following the economic crisis in the 1980s.

Annual Alberta 7-800 lb Feeder Steer Price



Source: CanFax

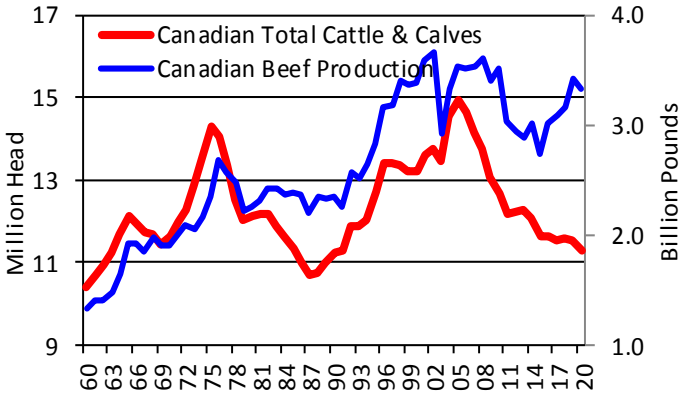
Feeder steer prices have remained historically strong over the last five years supporting profitability and providing stability for cow-calf operations. It is possible that operators have used the opportunity to reinvest in a younger cow herd and better genetics, in part explaining why the decline of beef cows has outpaced declined in heifers. The timing would be ideal, as slaughter cow prices have never been higher than they have been in recent history.

Cow-calf profitability

Expansion decisions are not based solely on prices, but on profits. Typically, profitability would be a good indicator for cow-calf operations to expand. Cow-calf operations have, 'on average,' been profitable from 2011 until today. Outside factors such as feed supplies, the profitability of other enterprises, political and economic certainty, equity positions, sustained confidence, land availability, regulations, and a producer's own experience play a role interrupting market signals like high prices in the self-propelling theory of the cattle cycle.

Production can still expand with the cow herd in decline when there is live cattle trade. Beef production has been increasing, up 25% from 2015 to 2019. This production momentum has been supported by feeder imports and expansion in the feeding sector.

Canadian Cattle Cycle & Beef Production



Source: Statistics Canada

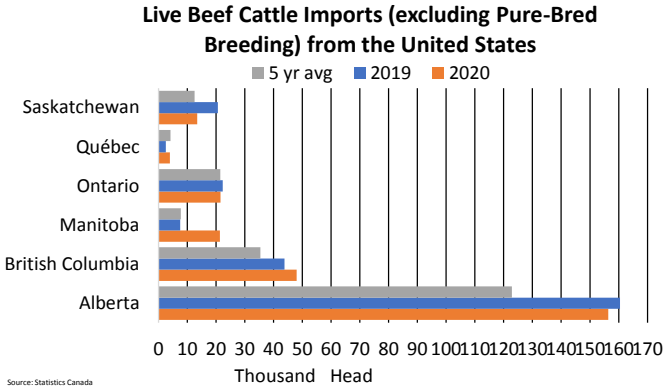
PART II: FEEDLOT EXPANSION

As beef cow numbers declined between 2005 and 2014, feedlot capacity shrank alongside until 2015. In 2015, feedlot capacity began to expand after several years of strengthening fed cattle prices in Alberta. At this point of feedlot expansion, the domestic feeder supply remained the same or shrank, keeping prices high on tight domestic supplies. Fewer calves increased the competition for feeders and supported

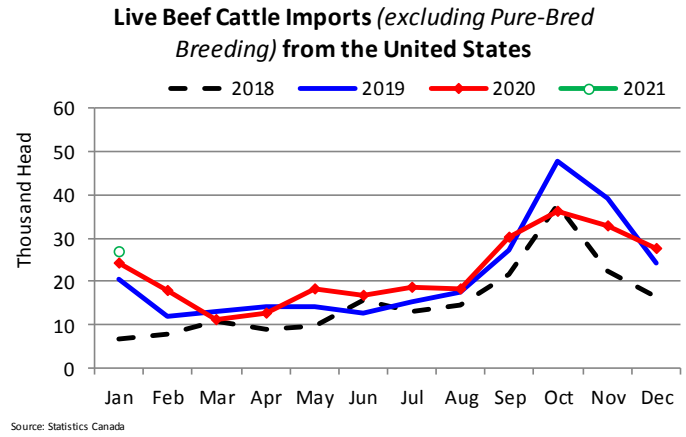
feeder prices. Tight supplies meant that navigating international live cattle trade could provide a competitive advantage to feedlots if the right deals were struck. The pressure necessitated the unlocking of new routes to supply feeders into Canada.

Feeder Imports

Feeder imports have been growing over the last five years, from just 10,545 head in 2015 to 271,412 head in 2020. In 2019, Canada became a net importer of feeder cattle, meaning it imported more feeder cattle from the U.S. than it exported. These imports are fueling the expansion in the feedlot sector.



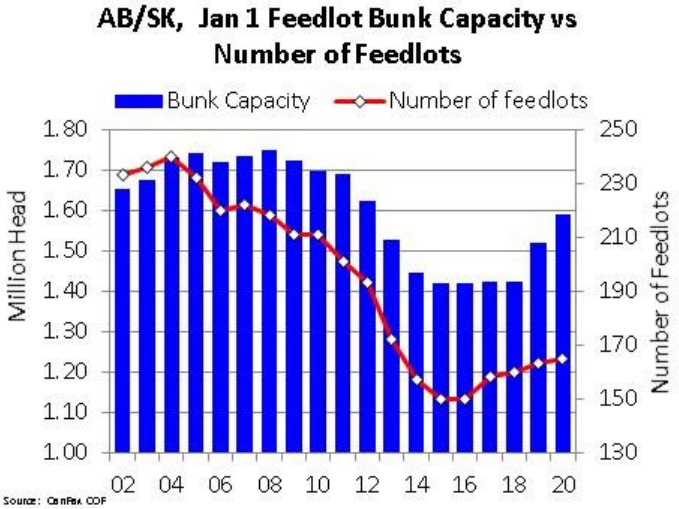
The Canadian feeder market has been strong despite the Canadian dollar being high, this has supported very strong feeder basis levels. The U.S. feeder market was generally stagnant to start the first quarter of 2021. Canadian feeder prices (Alberta 850 lb steers) were trading at an average $13 premium to U.S. feeder prices in the first quarter 2021. This has limited feeder exports and encouraged strong feeder imports into Western Canada.



Since 2017, cattle imports have quadrupled to around 257-265,000 animals in 2019-20 compared to pre-2017 imports of 15,000 head per year. In 2020, over 156,000 head were imported into Alberta, 48,000 head into British Columbia and 13,400 into Saskatchewan. Imports have also doubled in the east with 2020 reporting 21,500 head into Ontario and 4,000 head into Quebec. Interestingly, while 66% of cattle imports occurred in the fourth quarter in 2017, by 2020 this had declined to 36% with a more even distribution throughout the year.

Feedlot capacity

Feedlot capacity declined from 2008 to 2015 mirroring the liquidation of the Canadian cow herd. In 2012, finishing feedlot capacity dropped 6% and declined another 5% in 2013. Between 2011 and 2013 overcapacity in the feedlot sector resulted in consolidation of ownership. In 2011, there were 175 owners and in 2012 there were just 155, a 13% decline. There were some ownership or lease changes, while some lots remained idle. In Alberta and Saskatchewan, 218 lots consolidated to 150 between 2008 and 2015. There was a three-year period of consolidation from 2016 to 2018 when a small resurgence of mid-size feedlots (<10,000 head) that were backgrounding returned to finish cattle. Sector capacity began to expand in 2019 and grew further in 2020. In 2020 capacity was just shy of the 2008 high.

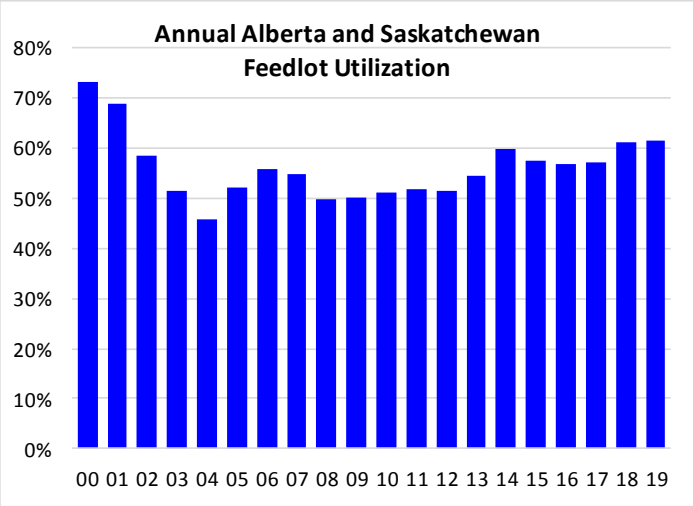


Bunk capacities have increased every year for the last five years as the feedlot sector expanded (2016 to 2020). The recent largest year over year increase in bunk capacity occurred from 2018 to 2019 (+6.6%), and then from 2019 to 2020 (+4.75%). In 2018, total bunk capacity growth was positive for the first time since 2008.

Feedlot marketings have also been growing since 2015. Despite setbacks in 2020 due to COVID-19, feedlot marketings were just 1% lower than 2019. Feedlot marketings in 2015 totaled 1.46 million head. By 2020, that number had grown 21% to 1.77 million head.

Feedlot Utilization

Between 2006 and 2016, cattle on feed numbers stagnated, between 980,000 and 1.07 million head. The number of cattle on feed began to increase annually starting 2017. In 2020, cattle on feed finally surpassed the 1.1 million head mark at 1.12 million head. For the last three years (2018 to 2020) feedlot utilization has been steady at 61%. Utilization rates are still shy of the closest comparable year (2001), when utilization was 69%.



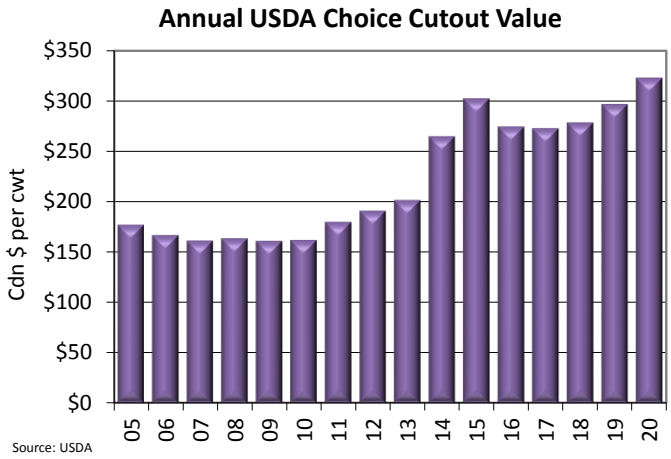
Domestic market structure

There were fewer smaller feedlots following the liquidation of the beef cow herd in Canada. Feedlots between 500 to 1,000 head one-time bunk capacity decreased from 20% in 2008 to 12.7% in January 2020 (capacity as a % of total). The percentage of mid-size (5,000-10,000 head) operations has fluctuated between 19% and 25% during the same period. By 2020, there were the same number of mid-size operations as 2008. There has been a resurgence of large feedlots, over 10,000 head, since 2016.

Large feedlots currently make up two-thirds of the market; whereas mid-size operations make up one-quarter and small feedlots make up the remainder. The number of owners of large feedlots has stayed relatively consistent, while owners of smaller operations and a few medium sized operations were the ones that left the market in 2012.

Demand for protein

Feedlots have been responding to the beef demand, where the market signals to expand have been strong. Recent history shows cutout value strength, with the AAA cutout moving from around CDN$150/cwt between 2004 and 2010 to top CDN$250/cwt since 2014. Strong pricing in these markets typically improves downstream margins, encouraging packers to process greater numbers of fed cattle and bid the price higher.



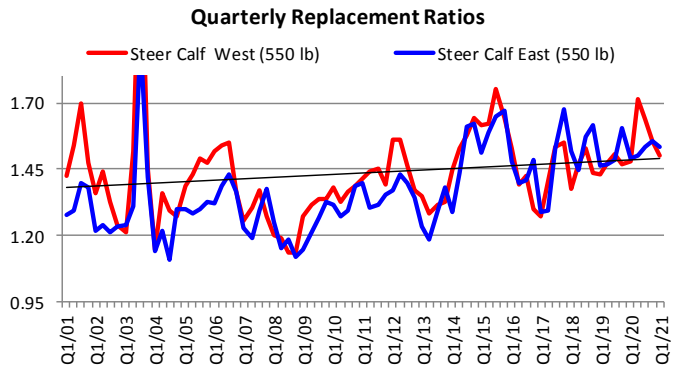
Expansion has also been driven by global demand for protein. Beef and veal exports have increased on average 5.9% in volume and 8% in value each year between 2016 and 2020.

The impact of input costs

One of the largest expenses for feeding enterprises is the **cost of feeders**. When faced with extended periods of strong fed cattle prices and profits, cattle feeders respond by bidding up the price they pay for feeder cattle. This relationship can be illustrated with the feeder price ratio – also known as the replacement ratio (these ratios are published in the May and November editions of the Cattlemen's Magazine in the ***Beef Watch*** article provided by the Canadian Cattlemen's Association).

The feeder price ratio is simply the price of feeder cattle divided by the price of fed cattle. Replacement ratios moved higher between 2013 and 2016, increasing sharply for steer calves east and west. Year to date first quarter 2021, yearling steer calf

replacement ratios were 1.50 in west and 1.53 in the east.



The higher replacement ratios since 2017, consistently above 1.45, are an indication of the competition for cattle as feedlots are looking to fill pen space. The benefits of economies of scale are only realized when the pens are full.

Feed costs are the second largest expense for the feedlot, next to feeder costs. Increases in grain prices increase the total cost of gain. For example, when barley is $3.00 per bushel, cost of gain is around $70.00/cwt. When barley is $5.50 per bushel, the cost of gain is approximately $107.00/cwt.

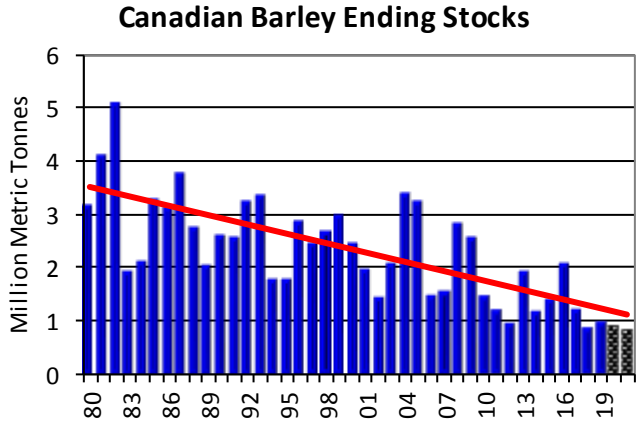
The price of North American feed has more than doubled since 2017. There is a direct and inverse relationship between feeder cattle prices and feed prices. When grain prices rise margins can be preserved by bidding down the price of feeder cattle. In the last five years, the squeeze on feeding margins has come from price supports for feeder cattle and the price of grain.

The March 2021 price for Lethbridge barley was $311.25/tonne, or $6.78 per bushel. The story is similar for Ontario and Omaha corn – its value is rapidly appreciating. The current rally in feed grain prices is being driven by speculation around the 2021/22 crop year, including demand from China to replace swill feeding in their hog sector. A potential drought in South America and a La Nina drought is threatening the U.S. mid-west over the next year.

Feed grain supply and disposition

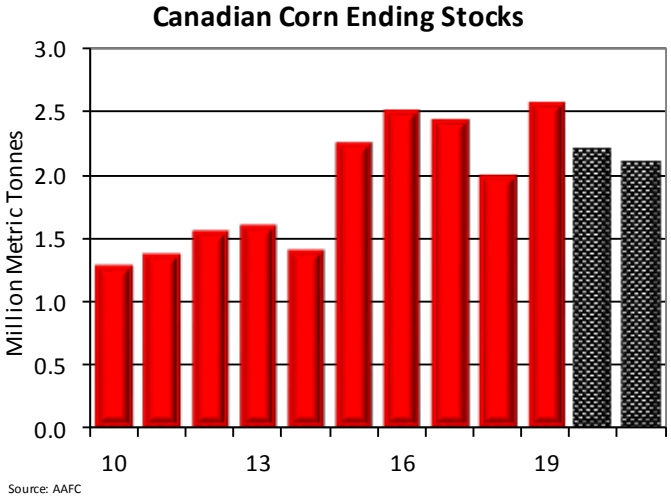
While droughts come and go, the big question for feed grains over the next five years is if demand from China will be sustained or if it too will cool off. This will be a major factor in feedlot profitability and incentives to continue adding pen space or not.

Ending stocks are projected to tighten for the upcoming crop year. Canadian Barley exports in 2020 were up 21% to 3.7 million tonnes, the highest since 2007 and 1996. Barley ending stocks for the 2020/21 crop year are projected by Statistics Canada to be up slightly from last year. Moving into the 2021/22 crop year, projections are for barley exports to decline 5% to 3.5 million tonnes with ending stocks at 0.8 million tonnes, the lowest projected ending stocks on record since 1980.



Source: AAFC, Staatistics Canada

Canadian corn exports in 2020 were steady with the five-year average of 1.4 million tonnes. Ending stocks for the 2020/21 crop year are projected by Statistics Canada to be down 14% from last year at 2.2 million tonnes. Moving into the 2021/22 crop year, projections are for steady corn exports with ending stocks the tightest since 2018.



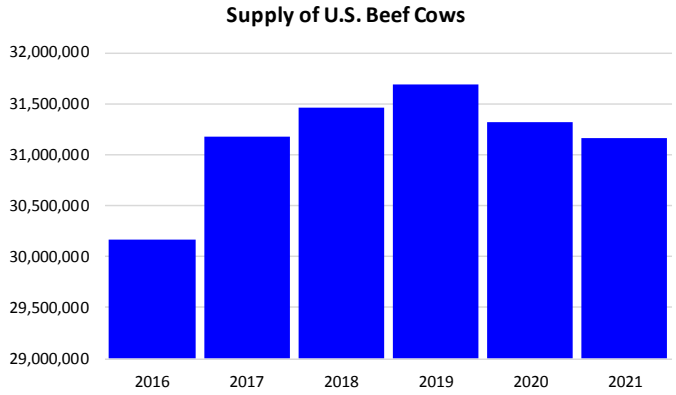
Source: AAFC

In contrast, U.S. corn exports in 2020/21p are up to 1.4 million tonnes, to be slightly below the five-year average of 1.4 million tonnes. Ending stocks for the 2020/21 crop year are projected to be down 19% at 1.55 billion bushels.

PART III: FEEDER SUPPLIES MOVE NORTH

The U.S. cattle herd peaked in 2019 providing an ample supply of feeder cattle for expanding Canadian feedlots. There were 94.8 million head of total cattle and calves January 1, 2019, in the U.S. Inventories were down 1 million cattle from 2019 to 2020 and down another 200,000 head in January 2021 to 93.6 million head.

U.S. beef cow numbers in January 2021 were down 1.7% or 533,000 head from the 2019 peak, but there are still 7.6% or 2.2 million more beef cows than in 2014 in the early years of U.S. expansion. In the Northwest United States of Oregon, Washington, Idaho, Montana, and Wyoming, along with Nebraska and North Dakota, beef cow inventories had not expanded as much as other regions in the Southern U.S. recovering from drought. Beef cow inventories in January 2021 were only up 2.7% or 143,000 head from 2014 in the northwest.



The U.S. calves (<1 year old) in January 2020, totaled 35 million head, down 3% or 1.2 million head from the 2018 peak but still 4.5% or 1.5 million head above the 2014 low. Calf inventories in the Northwest United States of Oregon, Washington, Idaho, Montana, Wyoming, Nebraska and North Dakota were down 3% or 170,000 head from the 2018 peak but still 0.4% or 25,000 head above the 2014 low. These states represented 17% of the U.S. calf crop in 2020. This rate has been consistent for the last five years, indicating steady supply in these states. The stable northern supply may mean that the lion's share of expansion occurred in the southern states. As southern supply grew, feeder cattle have been moving north to be processed in plants in the Northwest U.S. The displacement created a domino effect in which feeders typically slaughtered in the Northwestern U.S. have moved further north to Canada. In 2020, there were 6.02 million calves in the Northwestern United States.

Canadian feedlots have access to U.S. feeder cattle and have hooked into the global beef commodity market since 2015. Canada is competing with the U.S. for lower cost feeders as a desire for healthy margins drives sales toward these lower cost animals.

While technically both the U.S. and Canada are currently liquidating their herds, Canadian cow-calf operations are in a period of liquidation with a faint hint toward consolidation as the Canadian feeding sector continues expansion with a new 40,000 head facility set to open in 2021. That would be the largest new build of this kind in a decade. While liquidation of the Canadian herd continues, feedlots have already expanded and now a two-stage cattle cycle has integrated across North America.

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