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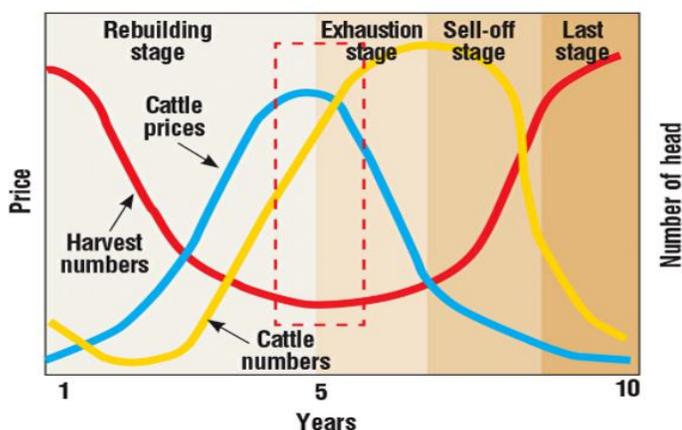


# Whole Herd Management Through the Cattle Cycle

Understanding the cattle-price cycle relationship helps cow-calf producers optimize profit, even when the cattle cycle is not readily apparent. The cattle cycle describes the long-run fluctuation in the size of the cattle herd in response to reproductive capacity and cattle prices. The cattle cycle typically lasts 10-12 years through herd expansion, peak, liquidation, and consolidation phases. The capacity for a production response (herd expansion) to the potential for higher profit (higher calf prices) is delayed by 2 to 3 years, as it takes time for breeding animals to produce calves. This is known as the biological lag and is the primary driver of the highs and lows in the cattle cycle.

Production decisions in response to cattle prices drive beef price cycles. As cattle inventories expand in response to strong cattle prices, the calf crop increases until the supply of calves outweighs demand and the price cycle turns down. As prices for beef and cattle decline, inventories decline. In effect, when inventories go up, prices go down. When inventories go down, prices go up.

### Cattle Price Cycle in Theory



Source: [Beef Magazine](#)

***The rub is that higher prices do not necessarily equal higher profitability, and it is profitability that drives producer's decisions to expand, not revenue alone.*** Since profitability = revenue – input costs, the input cost side of the equation can become a significant limiting factor in a producer's decision to expand. A recent Kansas State University Study found that cow-calf "profits are largely driven by the cost side," with less than expected impacts from revenue.

Additionally, due to the biological lag, the signals to expand that come from higher cattle prices are often delayed for producers looking to optimize investments and prices received at market. Cow-calf producers may find themselves buying high and selling low if constrained by the biological lag. Like any capital-intensive business, knowing when to invest in assets (breeding stock) and the potential for return on investment (calves) is key.

Producers can use knowledge of the cattle-price cycle relationship and an understanding of potential market disruptions to make investment decisions from a long-run, whole herd management perspective. Given the biological lag and the cyclical nature of the cattle industry, long-run management strategies based on the fundamentals of the cattle-price cycle can help mitigate risks from decision-making based on short-run price information or sudden, transitory market shifts.

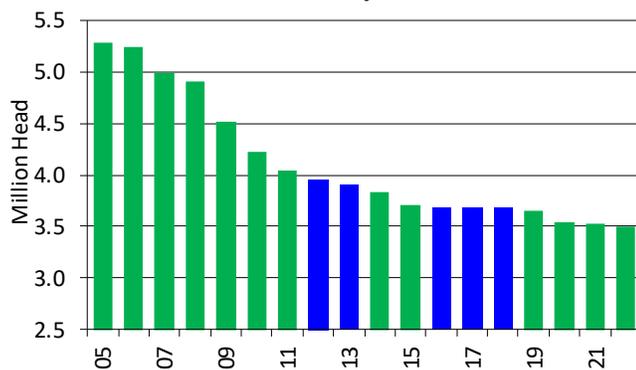
This fact sheet investigates traditional indicators of the cattle cycle and the current outside forces that are influencing producer decisions. It also looks at common revenue streams available on cow-calf farms and compares several common strategies using knowledge of the cattle-price cycle relationship to optimize investments and marketing.

## THE CATTLE CYCLE IN CANADA

### Beef Cow Inventories

Beef cow numbers provide an indication of the current phase of the cattle cycle. Beef cow inventories on January 1, 2022, decreased 0.9% from January 1, 2021, to 3.50 million head and to the lowest level since 1989. The Canadian beef cow inventory indicates the Canadian herd is now entering the trough of the cattle cycle.

Canadian Beef Cow Numbers  
January 1



Source: Statistics Canada

According to the beef cow inventories, the Canadian cow herd has been in decline since 2005. The herd has declined 33% between 2005 and 2022. For most of this period, the herd has been liquidated. Between 2012 and 2013, there was a short period of consolidation (growth or decline <1.0%), followed by more liquidation in 2014 and 2015, another period of consolidation between 2016 and 2018, and further liquidation to present day.

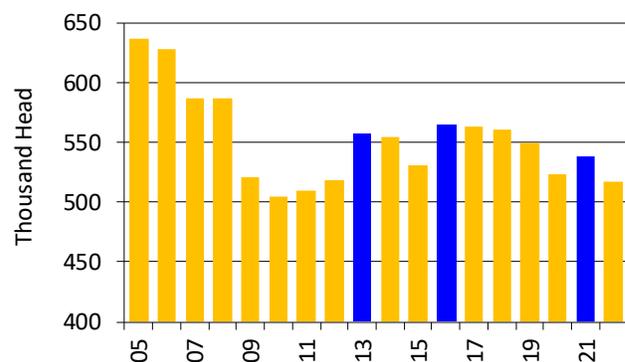
The liquidation phase in the cattle cycle is expected to last 3 to 4 years. The data would suggest there have been external factors inhibiting expansion of the cow-calf industry. The cattle cycle is vulnerable to disruptions from weather and other external factors such as equity positions, land availability, and input costs. Droughts are one external factor that often extend liquidation phases by reducing available pasture for cattle. During droughts, cattle producers can either sell cattle to reduce the number of animals grazing, or they can feed animals supplemental harvested forages, if available, which increases operating costs. Producers choosing to sell cattle

often force more cattle to market than normal by selling younger cattle at lighter weights, pressuring calf prices but also putting expansion on hiatus while pastures recover, and breeding stocks are rebuilt.

### Bred Heifer Inventories

Bred heifer inventories are an indicator for monitoring breeding decisions on farms year over year. Bred heifer inventories on January 1, 2022, decreased 2.8% from January 1, 2021, to 517,300 head and to the lowest level since 2011. The inventory of bred heifers has decreased 12% since 2005. Similar to the beef cow inventories, bred heifer inventories increased briefly in 2012, 2015 and 2020.

Canadian Beef Heifers (Breeding)  
January 1



Source: Statistics Canada

### Beef Cow Marketings

During the liquidation phase, cow marketings and culling rates increase. Cow marketings have been increasing since 2015, with the exception of 2020, when fed cattle were prioritized due external factors that backlogged the fed cattle supply. Cow marketings in 2021 at 683,200 head were up 3% from 2020, and up 4% from the five-year average. The beef cow culling rate in 2021 was 12% and has been above the 20-year average of 11% since 2015.

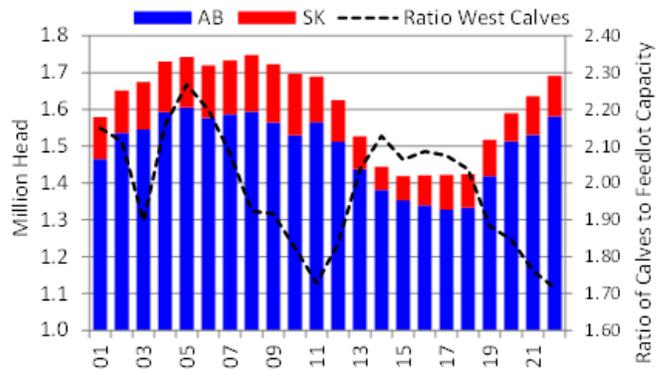
### Traditional Ratios are Less Useful with Feeder Imports

As cow marketings and beef cow culling rates move higher, it could be a sign of liquidation, but only when heifer retention does not offset it. The female to male disposal ratio and heifer to steer ratios have been

used in the past to evaluate if overall female marketings are higher or not. When the ratios move higher, it means more heifers relative to steers are being marketed as cow-calf producers sell young females. In 2021, the female to male disposal ratio was 0.87, well below the 20-year average of 0.99. The heifer to steer ratio was historically low as well at 0.57, well below the 20-year average of 0.67. However, heifer slaughter in 2021 was at the highest level since 2010 and steer marketings in 2021 were the highest since 2005. Steer numbers have been supported by feeder imports, skewing the historical ratios and making them of limited value in the current cattle cycle.

declined from 2.06 on January 1, 2015, to 1.72 on January 1, 2022, to the lowest ratio on record.

Alberta & Sask - Jan 1 Feedlot Bunk Capacity

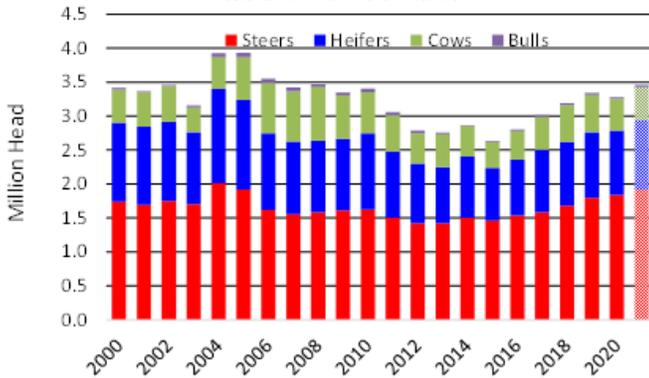


Source: CanFax COF

The cattle cycle persists because of a supply response to cattle price signals. In the last six years, a supply response has occurred not from higher calf prices but from a competitive U.S. cow-calf sector who have controlled input costs. U.S. feeder imports have filled the growing feedlot capacity as calf prices have been flat since 2016.

Annual Canadian Cattle Slaughter

Federal & Provincial Plants



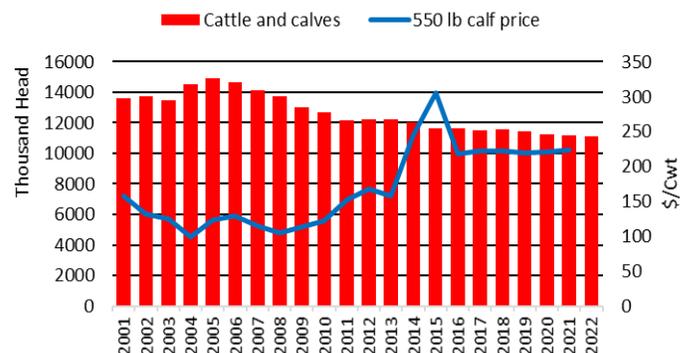
Source: CBGA

**Disruptions in the Domestic Cattle-price Cycle: Imports and Leverage**

Feeder imports grew from 10,570 head in 2015, to 377,571 in 2021 supporting fed cattle marketings. Consequently, slaughter utilization increased from 76% in 2015 to 96% in 2021. In 2015, slaughter utilization was at a seven-year low, but global beef demand was beginning to surge. The global beef price jumped 22% from US\$1.83/lb in 2013 to US\$2.24/lb in 2014. The U.S. cattle herd expanded in response at a time when the Canadian herd was consolidating.

Feedlot bunk capacity in Alberta and Saskatchewan increased 19% from 1.42 million head on January 1, 2015, to 1.69 million head on January 1, 2022. Yet the ratio of Canadian calves to feedlot bunk space has

Canadian Cattle and Calf Inventory Versus Price January 1



Source: Statistics Canada

At the bottom of the cattle cycle, as it appears in Canada, one would expect leverage to shift to the cattle producing sector. Due to access and the available supply in the integrated North American cattle market, Canada's cattle cycle seems largely influenced by the growth in the U.S. herd. Leverage has remained firmly in the packing sector and will shift only when North American cattle supplies tighten, or the processing sector expands. There is evidence of both occurring in 2022 with both Canadian and U.S. beef cow herds in decline.

The Canadian, domestic cattle-price cycle relationship *seems* absent. Even when it is not obvious, though, the influence of the cattle cycle persists. Timing supply responses within the cattle cycle is important and considering the U.S. influence on Canadian supply will be critical for cow-calf producers in whole herd management. With this knowledge, a cow-calf producer can manage their whole herd as a marketable resource through the peaks and troughs of the North American cattle cycle to find opportunities to profit until leverage shifts in their favour.

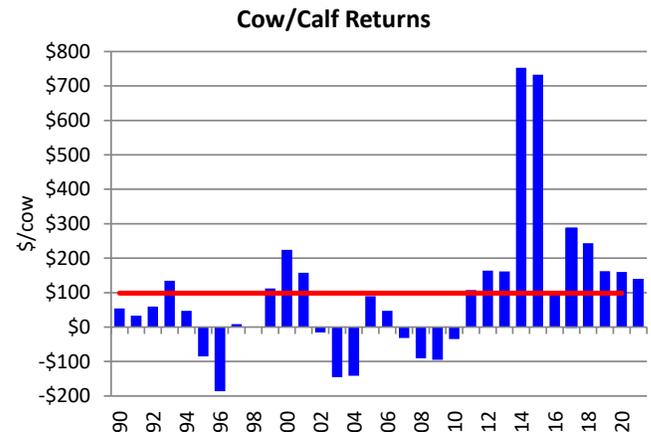
### TOTAL HERD AS A MARKETABLE RESOURCE

The calf-crop is the primary product from a cow-calf operation. More than two-thirds of total live weight sold from cow-calf operations participating in the Canadian Cow-calf Cost of Production Network in 2020 was from calves sold. However, this means one-third of pounds sold came from cull cows and other sales such as breeding stock or through pounds added after weaning. While the calf-crop is primary, whole herd management is critical.

First, managing the herd on calf prices alone may leave producers exposed to the pressure the cattle cycle poses on calf markets as a result of the biological lag. Second, maximizing versus optimizing the calf crop can lead to forgoing other revenue opportunities within the herd. Third, revenue may not be the most influential driver of profitability; the most common parallel between producers with positive net returns has been found to be related to cost, and primarily the cost of feed. As many well know, profitability comes from the margin, not just the market price.

While the annual profit per cow has been increasing since 2010, deflated profit per cow has been in decline since 2015 and margins in the cow-calf sector have been lower since 2017. Input costs have been rising since 2017, a strong determinate of the margin. The cost of winter feed for a 1,200 lb cow has increased 108% since 2016. Alberta hay that cost \$92/ton in the fall of 2016 now costs 114% more. Cattle mineral that

cost \$5.42 per 25 kgs for the winter of 2017 is projected to cost 39% more in the winter of 2022.



Grain stocks are tightening as well, with total domestic use and ending stocks of barley expected to be at the lowest levels on record in 2021-22p after a decade long decline in production. Corn production has steadily inclined for 30 years, but imports are expected to be at their highest levels on record in 2021-22p, with feed use up 27% from the previous year. There is also steady growth in food and industrial use, and exports of corn are historically high. It is apparent that if margins are not growing, cow-calf producers will not expand.

### ***Heifer Calf Retention***

The final years of consolidation are the often the best times to increase the number of heifer calves retained for breeding, depending on the situation faced by any one operation. A good illustration was in 2008, when 550 lb calf prices were at a three-year low and bred heifer inventories were historically low as well. Those who retained heifer calves in the fall of 2008 would have been rewarded by selling into the highest-priced calf markets since the turn of the century starting in 2014, and when that cow was in her most productive years. Those who waited for higher calf prices in 2014 would have had to wait two years before they had a larger calf crop to sell.

### ***Heifers and Steers***

Cow-calf producers can mitigate some risk by selling steers first. Selling heifer calves means that

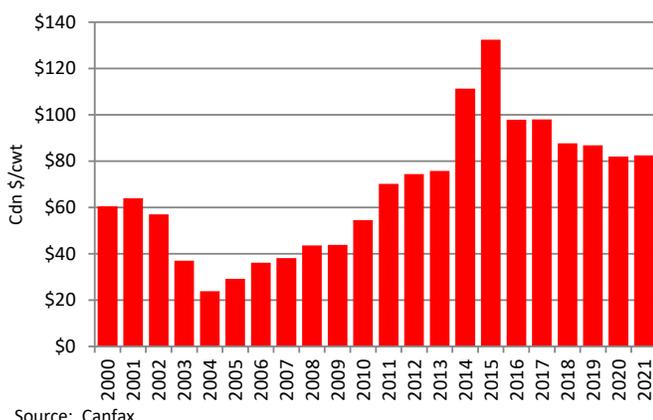
opportunities to sell as breeding stock or retain disappear, and selling steers first leaves those opportunities on the table. Retaining more breeding heifers than may be necessary is a way to mitigate risk at the bottom of the cattle cycle. Not only is there a head start to expansion, there would also be an opportunity to sell the heifers as bred heifers or grass yearlings. Sale decisions can be made just prior to breeding season when heifers can be sold as yearlings or bred heifers. Backgrounding or stocker operations where available can help alleviate pasture availability concerns. A good rule of thumb is to sell poor quality heifer calves early, like at weaning. In a 100 head cow-herd, with about 45 heifer calves, retaining 60% of heifers will permit rapid expansion if needed. The bottom 40% of heifer calves can be culled either before or after the breeding season.

**Selling steers first and retaining heifers during the final years of consolidation mitigates risk and provides more flexibility for expansion decisions.**

### Cull Cows

Few cow-calf herds can be profitable without generating some income from cull cows. Cow prices are also driven by the cattle cycle: the more cows there are available for sale, the higher the supply and the lower the price.

Annual Alberta D2 Cow Price



Source: Canfax

In the 2020 Canadian Cow-calf Cost of Production Network, an average 29% of total live weight sold came from cull and slaughter animals. Lower and middle-producing cows may not generate profits

when calf prices are low, but when calf prices are high, even small and late born calves may be profitable, helping to explain why the price of cows peaked in 2015. Keeping low producing cows when calf prices are good should net a profit on those smaller and late born calves. Culling open-cows when calf prices are low will make room for the introduction or retention of heifers who will be most productive during the years when calf prices are highest.

There are multiple ways that producers can market cull cows to fit with their operation.

1. Preg-checking and selling in the fall
2. Preg-check, feed opens separately and sell in the spring after the cull cow market improves
3. Sell opens after calving season
4. Develop a hamburger market through direct marketing and sell throughout the year

The marketing strategy chosen will be influenced by winter feed costs (\$/head/day), average daily gain, days on winter feed, market seasonality, cash flow needs and available feed. Fall marketing provides an opportunity to increase cash-flow and reduce feed requirements. Separating open animals to be sold in the spring allows producers to optimize rations – for pregnancy or for weight gain for sale. Developing your own market for hamburger allows for a premium, but may require more labour and capital to begin and maintain.

In addition, how heavy one culls will be influenced by each operation's goals. If the goal is to reduce cow depreciation, there are several ways this can be done:

1. Reduce replacement heifer development costs or purchase price for replacement heifers/cows.
2. Increase the salvage value of cows that are leaving the herd.
3. Increase the number of years a cow is productive in the herd.

Reducing the initial costs of the replacement heifers or sourced heifers and bred cows will lower the difference in the salvage value and the purchase of replacement costs. The purchase price for breeding

animals tends to decline as the cattle cycle moves into a liquidation and consolidation phase. Increasing the salvage value of females leaving the production herd will increase returns for the animal and lower depreciation. This occurs when the cattle cycle is peaking and requires the consideration of trade-offs between selling the cow at higher prices, or considering whether those calf prices will stay high enough next year to keep the cow. Reducing the replacement rate through prolonging the cow's production years spreads the development costs over more calves.

**Cull cow management is critical to profitability. Depending on the resources available and the phase of the cattle cycle, there are strategies to reduce input costs, maximize revenue through salvage value or through pounds weaned per cow.**

### ***Selling Breeding Stock***

Acquiring breeding assets so that the price received on the calves reflects their value is challenging. For example, in 2015 when bred heifer prices were highest, calves were sold into a calf market that has since averaged around \$2.20/lb. The most profitable breeding assets are those purchased so that their most productive years result in calves sold during the peak of the price cycle.

External factors may disrupt plans to buy low or sell high in any given year, but highlight the value of long-run, whole herd management and risk management strategies. Continual investment is frequently used to smooth out the highs and lows created by the cycle and support the long-term resilience of operations.

Increased inquiries about bred heifers and cows is one indication that the cattle cycle is about to turn toward expansion. When cattle prices are relatively high, producers typically purchase or retain more heifers and keep productive cows past normal culling age, increasing demand for breeding stock and expanding the size of the national herd as more aim to market more calves into the future. While it is easy to get wrapped up in what everyone else is doing, one can also examine other opportunities to sell.

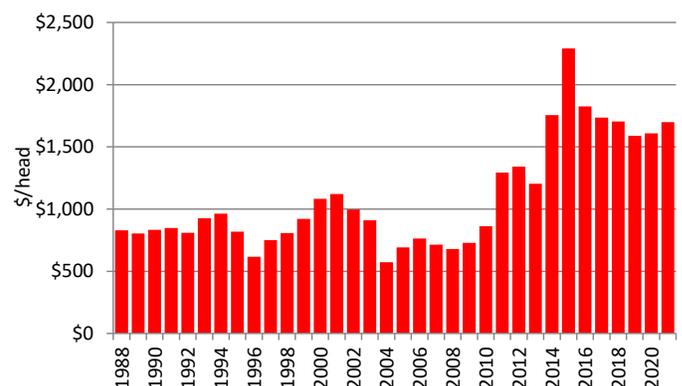
Investments in herd genetics is a long-term decision. During a drought, the decision to sell breeding stock may be met with uncertainty about being able to find similar quality replacement animals that are suited to the environment and management. Those who destocked will be looking to rebuild once pasture and feed conditions improve. Supplying that demand is an opportunity for those who were able to maintain their herd.

**The sale of breeding stock during peak prices can diversify revenue streams. This may provide the opportunity to invest in breeding stock at a time when breeding stock prices are lower, for example, during consolidation.**

### ***Breeding Stock Prices***

There is significant variation in breeding stock pricing between peak and trough years in the cattle cycle, representing significant variation in the opportunity for profit or loss based on the timing of bred cow sales within the cattle cycle. Bred cow prices declined 31% from \$2,290 per cow in 2015 to \$1,588 per cow in 2019. In 2020, bred cow prices increased 1%, and increased a further 6% in 2021 to average \$1,698 per head. The recent increase in price could signal movement from consolidation to expansion. However, in January 2022, weekly bred cow sales averaged \$1,558 per head, 7% lower than January 2021 and 1% lower than the five-year average for January. The drought in 2021, combined with concerns about weather and feed availability in 2022 appear to have dampened plans to expand.

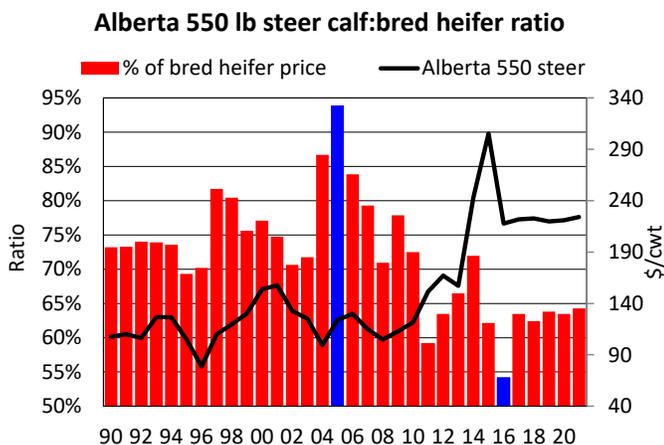
**Bred Cow Prices Western Canada**



Source: Canfax

Peak breeding prices indicate the cattle cycle is nearing its peak. It may be tempting to retain more heifers, but the calf crop produced is likely to meet the lowest part of the price cycle, meaning lower returns on more expensive cows. The breeding animal will be more expensive to buy at the opportunity cost of a cow not culled at higher prices.

Bred heifer prices are correlated with 550 lb steer prices – their future revenue stream. When the ratio of steer calf prices to bred heifer prices is high it indicates fewer calves are needed to pay off the initial investment. However, it can also point to a low in the bred heifer price cycle, which typically occurs at the top of the cattle cycle, as was the case in 2005. When the ratio is low, as it was in 2016, bred heifers are expensive compared to calves as more calves are needed to pay off the initial investment. The ratio is an indicator that helps focus the timing of investing in assets as a high ratio reflects a lower investment cost (bred heifer) and shorter pay-off period.



Between 1990 and 2004, the steer calf:bred heifer ratio ranged between 69 and 80% with some extreme highs like in 2005 at 94%. Since 2011, the ratio has ranged lower, between 54 and 72%. The lower ratio in the last decade indicates it has become relatively more expensive to purchase bred heifers and there is a longer payoff period. In the last five years, the ratio has been steady between 62 and 64%.

A higher 550 lb steer calf:bred heifer price ratio requires fewer calves per bred animal to pay off the initial investment. This occurs at the low of the bred heifer price cycle, or the top of the cattle cycle.

### *Shifting Classes of Cattle and Using Yearlings*

It can be tricky to maintain cash flow and buy breeding stock. When land, labour or capital are a constraint, make way for more cows and bred heifers by selling steer calves rather than feeding them as yearlings at the bottom of the cattle cycle. This provides more flexibility to expand if the market for calves improves by leaving your breeding herd in-tact. After liquidation, depending on the culling rate, it can take [two to six years to rebuild the herd](#), with variable impacts to profit and cashflow depending on the rebuilding strategy (e.g. retaining heifers or purchasing); this may mean foregoing potential high calf prices or paying interest on credit.

For example, between 2017 to 2021, the price for 550 lb steer calves has remained tightly between \$220/cwt to \$224/cwt, annually. The yearling market has also stayed tight between \$179/cwt and \$186/cwt, annually. During this time, producers may have grossed between \$311 and \$349 more for each yearling steer versus calf. However, if the cost of feeding yearling steers on pasture is greater than the difference in gross margins, selling a calf will be more profitable and leaves more acreage for breeding animals, reducing per cow costs and providing flexibility to expand.

**At the bottom of the cattle cycle, you may be getting more for a yearling versus a calf, but giving up higher returns per cow by choosing not to expand.**

### MANAGEMENT STRATEGY SUMMARY

In a perfect world, businesses would have unlimited resources and cash flow for agile management, and the ability to zig when the market zags. However, a ‘contrarian’ strategy may not be the most profitable solution either. In reality, land, labour, and capital constraints, including cash flow needs, play an

influential role in breeding-decisions. There are several long-view herd management strategies that may allow producers to stay on track when short-run obstacles arise.

### **Strategies for Long-run Herd Management**

The **counter-cyclical strategy** aims to have the largest calf crop available for sale when prices peak at the bottom of the cattle cycle when national supplies are the tightest. However, analysis has shown that the counter-cyclical or contrarian strategy is not necessarily the most profitable. Not only that, but cycle peaks are difficult to predict and there is a considerable amount of risk involved in going for the 'grand-slam' opportunity if external factors disrupt the market. Year over year, the most prolific piece of advice heard from experienced producers is to start slow, and don't over-extend yourself.

A **steady herd size strategy** can help provide consistent cash flow. It involves retaining the same number of heifers each year to maintain the cow herd size. This strategy may be good for a fixed land base. In addition, a **steady cash flow strategy**, may appeal to start-ups or operations who calculate and set their cash-flow needs. In this strategy, steers are sold first, then cull cows, bulls, and then heifers in the amounts needed to meet cash flow goals. The remainder of heifers are retained.

A **dollar cost averaging strategy** focuses on cost of production and proposes that retaining the same *value* of heifers each year provides better performance than a steady herd or steady cash-flow strategy. The strategy capitalizes on the assumption that lower priced heifers produce higher priced calves, a strategy suited to those with goals to optimize pounds weaned per bred animal.

## **CONCLUSION**

The cattle cycle may seem muddled when external forces intervene. All elements of the beef complex interact to influence the cattle-price cycle. Long-run strategies that use knowledge of the cattle-price cycle relationship can be utilized to evaluate herd decisions.

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