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A Division of the Canadian Cattlemen's Association



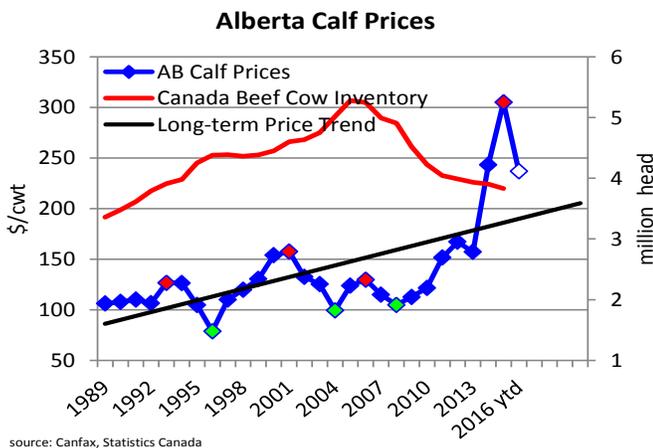
The Price Cycle and Evolving Cycle Drivers

The price peak is in. While the Canadian cow herd has remained steady, there has been aggressive expansion in the U.S. and reduced feeder exports over the last year have supported beef production in Canada. Larger protein production continues to pressure prices. As cattle prices have moved lower throughout the second half of 2015 and 2016, the question has become "how low can prices go?" and "when will prices hit bottom?" To help answer these questions this factsheet (1) reviews the previous price downturns in the past three decades, and (2) takes a closer look at some driving factors in the current cycle.

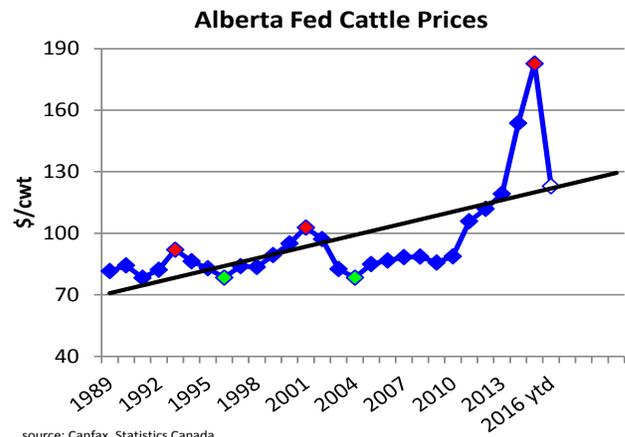
THE PRICE CYCLES IN CANADA

The cattle cycle causes beef price cycles. The two are highly correlated, but run in opposite directions. When production increases prices decrease and vice versa. The time-lag between when larger beef cow inventories are seen and when actual beef supplies increase result in the live cattle futures being discounted to current cash trade. Other factors, influencing futures prices can also obscure the market.

The long-term trend shows that prices have been generally trending upward with annual prices moving above and under the long-term trend. The red points in the chart represent the price peaks and the green points represent the lows in different periods. Despite the different inventory and economic situations seen in each cycle, **prices typically moved below the long-term trend line in 1 to 2 years after the peaks with the lows occurring in two to four years.** If this trend continues to hold, it would suggest that annual calf prices may fall below the trend line around \$200/cwt in the next couple of years and bottom in 2017-2019.



The chart above shows Canadian beef cow inventories, Alberta calf prices and the long-term price trend over the past three decades. Between 1990 and 2005 when inventories were generally increasing, cattle prices traded between \$100-150/cwt. As inventories liquidated after 2006 calf prices stabilized and started to increase in 2009 before soaring to record highs of \$300/cwt in 2015.



Fed cattle prices show a similar pattern as annual prices typically bottom in about three years after the peaks. The exception was the 2005-2009 period where calf prices swung between \$100-130/cwt, but fed prices were flat at \$85-88/cwt.

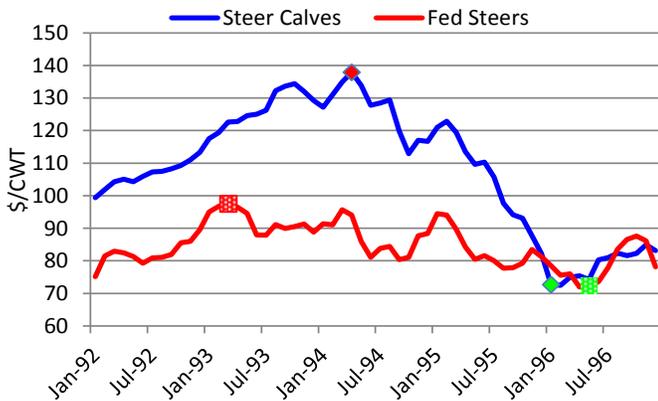
As of August 2016, fed price have lost most of the gain from the last two years, to be back at March 2014 levels. Year to date prices are in line with the long-term trend. If the market follows previous cycles, prices may continue to fall below the trend line and bottom in 2017 or 2018.

Although the historical trend gives us an idea on where the market is going, it should be remembered that **no two cattle cycles are exactly the same.** A review on the historical monthly calf prices on the previous prices peaks and bottoms and the specific driving factors during those

periods can give a better idea of what to expect moving forward.

1992-1996

Alberta Cattle Prices 1992-1996

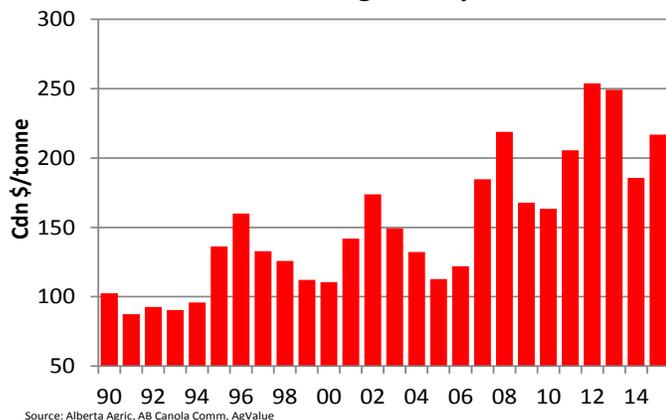


Source: Canfax

	Peak	Bottom	%Change	Duration (month)
Calf	Apr 1994	Feb 1996	47%	23
	\$138	\$73		
Fed	Mar 1993	Apr 1996	27%	38
	\$98	\$72		

The Canadian beef cow herd expanded throughout the 1992-1996 period with an average annual growth of 4% before expansion stalled in 1997-1998. During this period, calf prices increased from \$99/cwt in January 1992 to the peak of \$138/cwt in April 1994, then moved into the downturn and bottomed at \$73/cwt in January 1996. From the peak to the low, prices dropped 47% over 23 months.

Lethbridge Barley



Source: Alberta Agric, AB Canola Comm, AgValue

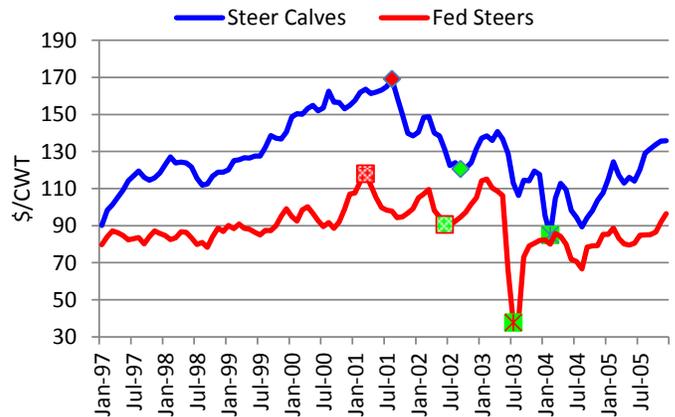
Feed costs played a key role in the downturn. Low feed cost before 1993 supported expansion, but feed costs

more than doubled between 1993 and 1995, resulting in a sharp decline in feeder cattle prices, which ended the expansion phase of the cycle.

Looking at historical Lethbridge barley prices, the spikes in feed costs have also been closely correlated to the declines in calf prices in the downturns in 2001-2002 and 2006-2008.

1997-2005

Alberta Cattle Price 1997-2005



Source: Canfax

	Peak	Bottom	%Change	Duration (month)
Calf	Aug 2001	Sep 2002	29%	14
	\$169	\$121		
Fed	Mar 2001	Jul 2002	24%	17
	\$118	\$90		

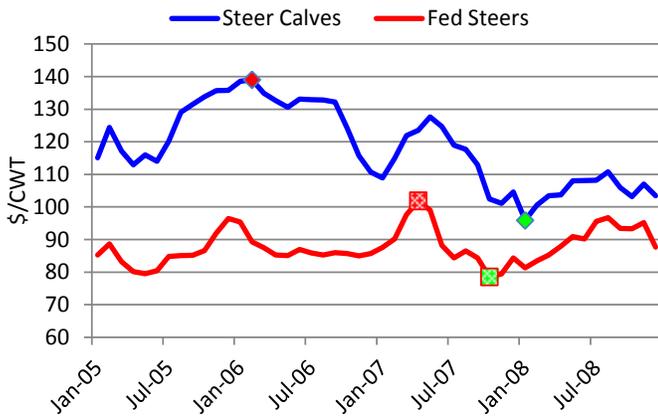
The downturn over the 2001-2004 followed years of increased cow inventories, and was largely affected by the drought in 2001-2002 and BSE in 2003.

In 2001, Canadian cow inventories totaled 4.6 million head, which was 16% larger than 1994. Calve prices peaked at \$169/cwt in August 2001 before entered the downturn with the 2001-2002 droughts caused poor pasture conditions, high feed cost and cattle sell-off. Prices made a low at \$121/cwt in September 2002 before recovering to \$140 in early 2003. However, the market was hit hard again in 2003 and 2004 by BSE, with prices plummeting 50% from the peak to \$85/cwt in February 2004.

Excluding the abnormal 2003-2004 period, the 29% decline from August 2001 to September 2002 occurred over 14 months. The 50% drop from the peak to the BSE low of took 31 months.

2005-2008

Alberta Cattle Prices 2005-2008



Source: Canfax

	Peak	Bottom	%Change	Duration (month)
Calf	Feb 2006	Jan 2008	31%	24
	\$139	\$96		
Fed	Apr 2007	Oct 2007	23%	7
	\$102	\$79		

Cattle prices saw a minor uptick in 2004-2006 as key export markets reopened to Canadian beef and cattle. However, limited exports in previous years resulted in large cattle inventories. In 2005, beef cow inventories peaked at 5.28 million head, which was 11% larger than the pre-BSE (2003). Meanwhile, grain prices were also skyrocketing due to the expansion of the U.S. ethanol industry, pressuring calf prices lower. From February 2006 to January 2008 (24 months), prices moved 31% lower from \$139/cwt to \$96/cwt.

It should be noted that a low was made in January 2007 at \$109/cwt (down 22% from the peak) with a rebound in the first half of 2007 before dropping further. Rebounds can be expected as the market moves lower and should not be mistaken for a true bottom. The Alberta fed market has already seen one rebound from December 2015 to January 2016.

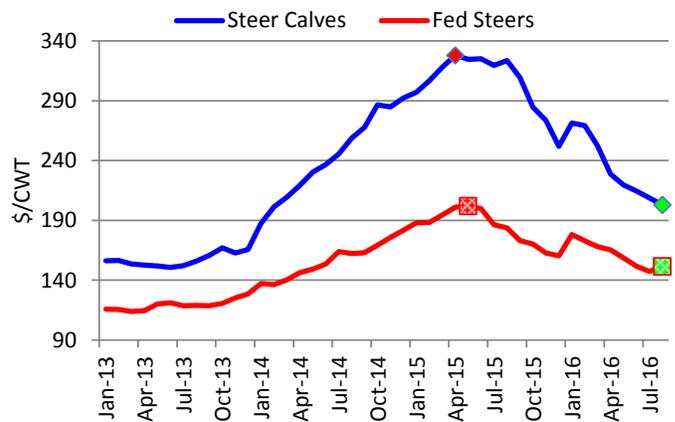
2014-current

Looking at the current downturn, Alberta calf prices have already dropped 39% in 16 months from the peak of \$328/cwt in April 2015 to \$201/cwt in August 2016. This drop has been larger than the 2001-2002 and 2006-2008 downturns, but it is still smaller than the 1994-1996 drop of 47%. Given how far above the long term trend calf

price remain, further declines are expected over the next couple of years.

Fed cattle prices have dropped 30% from the May 2015 peak of \$202/cwt to \$142/cwt in August 2016. This is larger than any of the previous cycles reviewed, except the BSE low of 50%. The 2014 and 2015 price rally was partially driven by a unique shortage of all proteins (beef, pork and poultry) in North America; resulting in a larger upswing than previous cycles. **Consequently, the downturn of the current cycle is expected to be larger than other cycles, reflecting the 'false' top.**

Alberta Cattle Prices 2013-2016



Source: Canfax

	Peak	Current	%Change	Duration (month)
Calf	Apr 2015	Aug 2016	39%	16
	\$328	\$201		
Fed	May 2015	Aug 2016	30%	15
	\$202	\$142		

FACTORS AFFECTING THE CURRENT CYCLE

The biology of a cow and profitability are the two fundamental drivers of a cattle cycle. However, as the industry continues to evolve and globalization takes place, a number of other factors are becoming increasingly influential.

Biological factors

The biological lag time is one of the fundamental factors that drive the cattle cycle. This lag is defined as the amount of time between when producers decide to expand or contract production and when cattle and beef supplies actually change.

The lag time between herd rebuild and increased cattle supplies is typically two years, as heifers retained in the

fall will not be bred until the following summer and not calve until the spring after that. The time lag is even longer when it comes to beef supplies, as the calf will not reach slaughter weight until the third or fourth year.

Since this reproductive biology cannot be changed, cattle cycles will continue to occur. However, the biological constraint in livestock dynamics has become less significant while technology and management emerge as important cycle drivers.

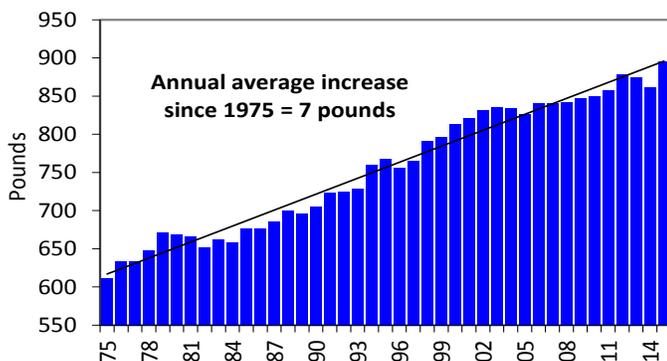
Marketing Factors

Carcass weight

While beef cow inventories in the past decade declined 28% from 5.3 to 3.8 million head, the reduction in beef production was smaller at 23% from 3.5 to 2.7 billion pounds.

From 1975 to 2015, steer carcass weights increased on average 7 pounds per year. Increased productivity per cow, due to increased carcass weights, has had a large influence on supply in recent years. Thus reduction in cow inventories has a smaller impact on beef production since increased carcass weights made up for part of the reduction.

Canadian Annual Steer Carcass Weight



Source: CBGA

While heavier carcass weights are a result of genetic, technology and management improvements over the years. Feedlot decision in market timing has an impact on carcass weights and beef production over the short term.

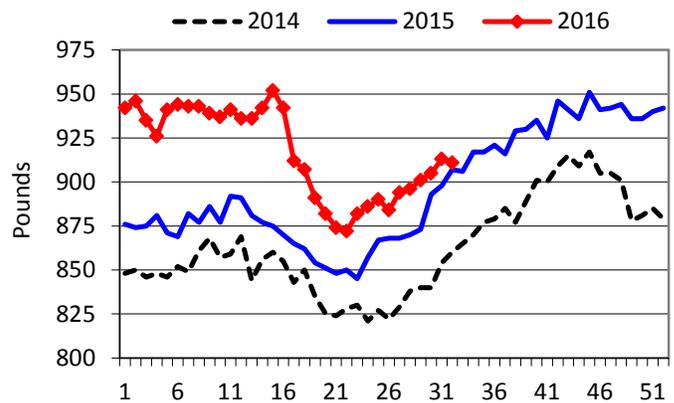
As North American cattle supplies were at the tightest levels in 2014-2015, steer calf prices peaked at \$325/cwt in Alberta and US\$282/cwt in the U.S. in June 2015. The swap in price to bring new cattle into feedlots was high. This combined with low feed costs provided incentives to put extra weight on finishing cattle. In 2015, average carcass weight jumped 36 lbs to 850 lbs in Canada. With

annual cattle slaughter at 2.5 million head, the increased carcass weight added 90 million lbs of beef to the market.

As cattle supplies have increased and fed prices moved lower throughout 2016, carcass weights have pulled back since April. U.S. steer carcass weights have been running below year-ago level since mid-May; while Canadian steer carcass weights moved back in line with 2015 in August and are expected to run below year-ago in the fourth quarter.

While increased cattle supplies and beef production typically lead to lower prices, **it is important to monitor the change in carcass weights and how those weights impact overall beef production.**

Cdn Weekly Steer Carcass Weight



Source: AAFC, CBGA

Cattle exports

Canada exports on average 1.1 million head of live cattle per year. This annual export volume equals to about a quarter of Canada’s total beef cow numbers. Due to the large cattle exports, market signals for herd expansion or liquidation in Canada are influenced by cattle demand from the U.S., Canada’s major export market for live cattle. Changes in cattle inventories in Canada do not necessarily translate into corresponding change in cattle supplies or locally beef production.

During the drought years, the U.S. beef cow herd declined 5% from 30.85 million head in 2011 to 29.30 million head in 2013. During the same period, the Canadian beef cow numbers were relatively steady with a 2% decline from 4.0 million head to 3.9 million head. When strong calf prices and good cow-calf profits signaled herd expansion in 2014 in both sides of the boarder, U.S. demand for feeder, especially heifers, was strong. Meanwhile the cost

of gain advantage stateside also encouraged feeding cattle south of the boarder.

Marketing time effect

While the biological and economic factors have been well recognized as the two key drivers for the cattle cycle, Hamilton et al. (2000) introduced another possible contributing factor: marketing time effect.

“The market timing effect stems from the perceived independence between individual output and market prices in a competitive industry: a competitive producer views aggregate output to be independent of his or her own output choice. Consequently, the biological lag in the accumulation of aggregate inventory provides an individual producer with the incentive to forego sales in periods of large industry output and low prices in order to increase sales in subsequent industry rebuilding periods of low output and high prices. That is, cycles in aggregate inventory levels provide an individual producer with an incentive to ‘time the market’, or to deviate from the aggregate movement of the cycle by behaving ‘countercyclically’.” **These individual attempts to maintain countercyclical inventories could dampen the impacts of the fundamental drivers, and somewhat smooth out the cattle cycle.**

Using a simulation model of net returns from 1974-1998 in the U.S., the study found that the market timing effect has an important influence on the determination of the various phases of expansion and contraction in the cattle cycle.

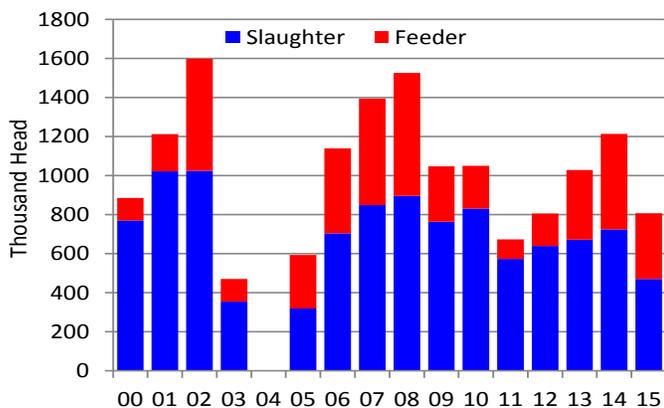
While there is limited work in Canada on this subject, the marketing effect may also be the case in here. As the industry has better understanding about the cattle cycle, producers’ access to market information have also improved significantly thanks to advanced communication technologies. More producers might be able to develop countercyclical strategy, enhancing the marketing time effect.

External factors

China Beef Demand

Beef demand, domestically and internationally, is no doubt a key driver for the cattle cycle and price cycle. In order for production signals to work, end users (i.e. retailers, foodservice, importers) must provide an incentive to suppliers to increase or maintain supply. Increased beef demand results in stronger wholesale beef prices. Increased revenues at the packing sector in turn results in packers being encouraged to process greater numbers of fed cattle, increasing the demand for fed and

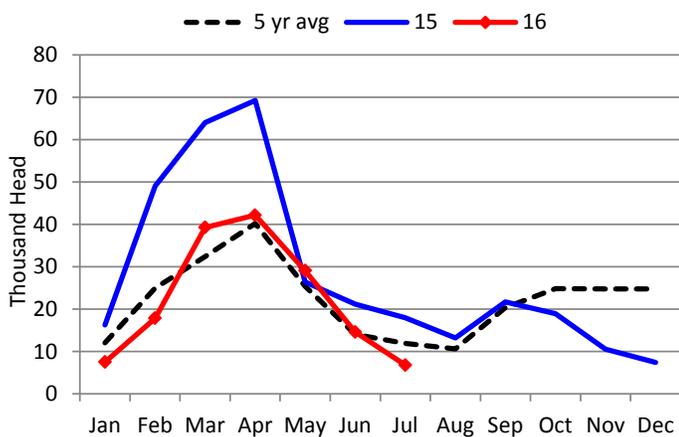
Live Cattle Exports



Source: Statistics Canada

Canadian feeder exports spiked in 2013-2015 to 330,000-490,000 head annually, compared to 100,000-220,000 head in the previous 3-year period. In 2014, the proportion of heifers reached a record high of 67% compared to the long-term average of 53%, which has restricted expansion in Canadian herd in the following year.

Feeder Cattle Exports



Source: Statistics

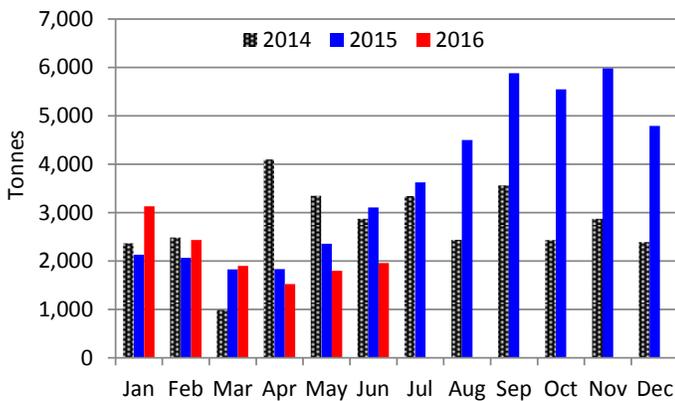
As U.S. competition eventually diminished as a result of herd expansion there, feeder exports normalized in 2016. Annual export volumes are expected to be in line with the five year average at around 250,000 head. **Canadian feedlots are now facing improved supplies without a substantial increase in Canadian cattle herd**, and the price signal for expansion has weakened with calf prices down 37% from the peak of \$328/cwt in April 2015 to \$201/cwt in August 2016.

feeder cattle and subsequently resulting in price transmission throughout the supply chain.

The retail and foodservice market landscape has changed a lot in recent years with changing demographics and lifestyle, diversified protein choices, and the increasingly integrated global market. A discussion on the impact of these factors on beef demand can be found in the CRS Factsheet: [Consumer Demand](#).

The two main destinations for Canadian beef are the domestic and U.S. markets. These are mature markets with relatively stable demand. A critical factor for growth in the current the cattle cycle is demand from Mainland China. In 2013, Mainland China entered the international market in a big way with beef imports jumped nearly four times from 86,000 tonnes to 412,000 tonnes. The volume is anticipated to double to 825,000 tonnes in 2016. During 2012 to 2015, Canadian beef exports to Mainland China increased 23 times from 1,400 tonnes to 32,900 tonnes, with China being Canada’s second largest export market in 2015.

Monthly Beef Exports to China
incl. HK and Macau



Source: Statistics Canada

Despite the high expectation in the Chinese market given their strong import demand and large population, complex political and economic factors also affect trade, creating uncertainties in the market. In 2016, exports to Mainland China plummeted from 1,800 tonnes in January to 32 tonne in June as stricter inspection for ractopamine was implemented in their food distribution channels. Even though part of the exports are reported to be redirected to Hong Kong, and monthly exports to Mainland China and Hong Kong as a whole remained steady at 2,000 tonnes, the turbulence in direct exports to the Mainland are likely to have exporters more cautious when expanding market share.

In the long term, the supply gap in China is expected to grow and government’s 13th Five-Year-Plan acknowledges international trade as an important factor in meeting consumer demands. This has given beef exporting countries and companies reasons for optimism.

Exchange rate

The exchange rate directly impacts Canadian cattle prices. The exchange rate’s impacts on the Canadian cattle cycle was obvious in 1986-1987, when the Canada/U.S. exchange rate at \$0.72-0.75 pushed cattle prices higher in Canada and supported expansion. The exchange rate depreciated throughout most of the 1990s, moving from \$0.87 in 1991 to \$0.67 in 1999. The lower exchange rate supported prices and the Canadian beef cow herd expanded 26% from 3.5 million head in 1990 to 4.4 million in 1997.

The Canadian dollar went through rapid changes from PAR in 2013 to bottom at \$0.70 in January 2016, before strengthening to trade between \$0.77-0.78 since April 2016. The exchange rate supported the Canadian feeder basis at record strong levels during the fourth quarter of 2015 and the first two months of 2016 when Canadian feedlots bid higher to keep cattle in the country, but as the year progressed the basis retreated back to the long-term average with the strengthening Canadian dollar.

Monthly Canadian Dollar



Source: Bank of Canada

The key drivers for the exchange rate are oil price, the value of U.S. dollar and monetary policy. Historically, the correlation between oil prices and the values of Canadian dollar suggests that a 10-dollar move in oil prices would lead to a 3-cent move the exchange rate in the same direction, holding everything else steady. This may imply that the oil prices will need to see about \$15-20 decline to

bring the Canadian dollar back to \$0.72-73, the levels that sparked expansion in the 1980s.

Aside from oil prices (more details on the oil prices impacts, see CRS Factsheet: [Opportunities and Challenges in the Expansion Phase](#)), **the looming U.S. interest rate hike is also a critical factor to watch in the near term.** As the Federal Reserve raised its key interest rate from 0-0.25% to 0.25-0.50% in December 2015, the Canadian dollar dropped sharply from US\$0.75 in November to US\$0.70 in January. As of mid-September 2016, the Fed Funds futures placed the odds at 30% for a September rate hike and a 57.2% chance in December. If the U.S. interest rate increases, the Canadian dollar could see another dip, holding everything else steady.

Weather

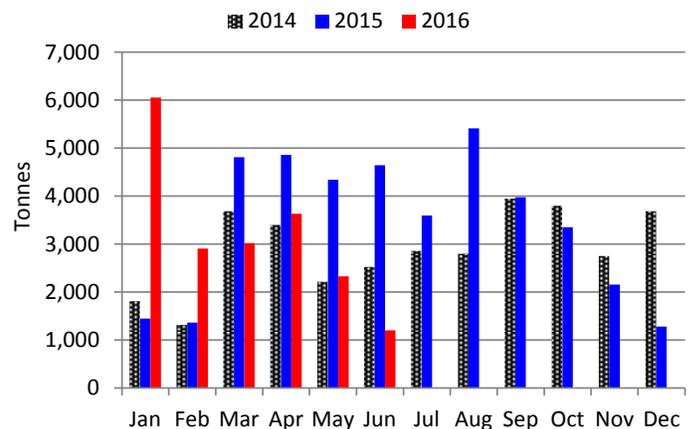
Like all other agricultural commodities, the cattle production and price cycle are inevitably affected by weather conditions. The droughts happened in the early 2010's drastically reduced the breeding female inventories in the U.S. when cattle prices signaled expansion. Extremely tight cattle supplies after the prolonged droughts send cattle prices to record high in 2014 and 2015 and sparked aggressive expansion in the U.S.

A survey conducted in the U.S. by Cattlefax suggests that additional forage is the second main reason for expansion, following profitability. The implication is that as cow-calf profits moderate in 2016, **good weather conditions that keep feed supplies ample would be a key factor for expansion going forward.**

In 2016, weather conditions have been fairly friendly. As of late August, Canadian barley production was projected to increase 5.8% to 8.7 million tonnes. Pasture/Hay conditions in Alberta was rated 76% rated good or excellent. However, the continuing wet conditions in the summer have been affecting hay quality.

Weather condition also plays a key role in the global market. In 2013-2015, drought in Australia induced large slaughter in the country and increased beef supplies in the global market. Trim prices in North America were pressured by large Australian imports and in turn affected cow prices. As moisture conditions improved in Australia in 2016, annual beef production is projected to be down 15% and beef exports down 20%. Reduced Australian supplies in the global market will be a positive factor for North American producers.

Monthly Beef Imports from Australia



Source: Statistics Canada

Psychological factors

For herd expansion to be sustained, producers need to be confident that the price signal supporting profitability is not going to disappear over the next two to three years. On the other hand, the overall market emotion can be an indicator of the stage at the price cycle.

Optimistic and pessimistic factors

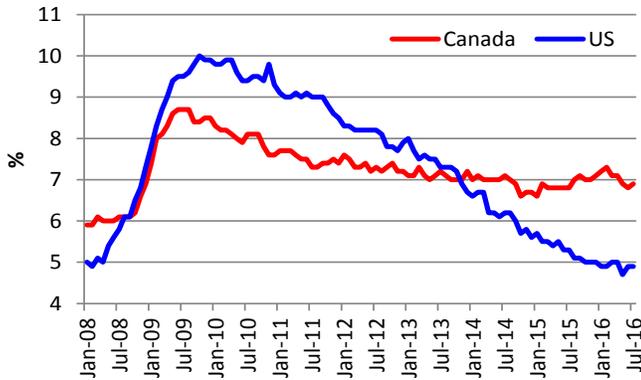
Looking over the past 15 years, the North American cattle cycle had coincided with a series of incidents such as 9-11, BSE, global financial crisis, droughts and the shift in oil prices. These combined with the long-term negative margins in the cattle industry dampened producer's confidence in the overall economic outlook and caused more caution in the expansion phase.

Looking forward, the overall economy in Canada remained somewhat gloomy with GDP contracting 1.6% year over year in the second quarter of 2016, which is the worst quarterly performance in 7 years. While the contraction is related to the wildfires in Alberta, low oil price will continued to be a constraint to economic growth. The job market has also been disappointing with unemployment rate standing at around 7%, compared to the significant improvement in the U.S.

Signals from the food service sector are somewhat mixed. The Restaurants Canada survey in Q1 2016 shows that restaurant operators are more optimistic about the next six months as they expect sales to accelerate compared to the previous six months, rose for the second consecutive quarter. The share of foodservice operators reporting higher same-store sales remained close to an all-time high in Q1 2016. However, in the U.S. foodservice demand is reported to remain a source of great worry for livestock

producers as the Restaurant Performance Index has been steadily declining since its peak in 2014.

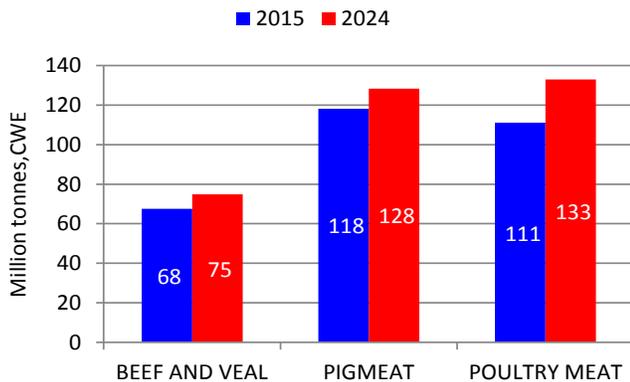
Unemployment Rate



Source: Statistics Canada, Bureau of Labor Statistics

The global picture should give beef producer’s reasons for optimism, especially as growth in the industry is largely driven by global demand. With the global population projected to reach 8.4 billion and middle class to rise from 2 billion to 4.9 billion by 2030, global beef demand will continue to be strong. Global beef consumption is projected to increase 10% to 75 million tonnes by 2024. This represents opportunities for the expansion in the next decade.

Global Meat Consumption

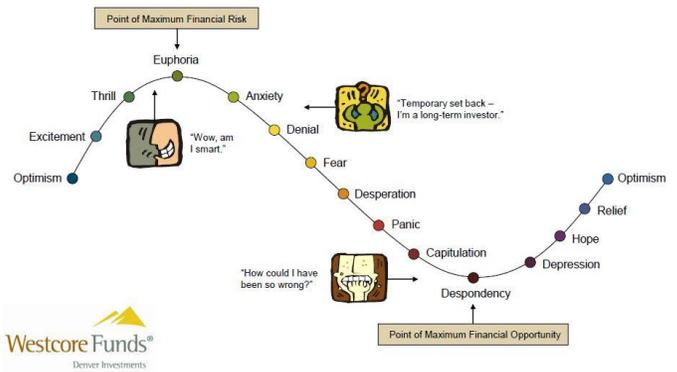


Source: OECD-FAO Agricultural Outlook 2015

The Cycle of Market Emotion

To answer “when is the market going to bottom?” analysts use market emotion used as an indicator. According to the Cycle of Market Emotions (Westcore Funds, Denver Investments Advisors LLC, 1998), during the downturn, average market participant emotions would go through different stage from Anxiety, Denial, Fear, Desperation, Panic, Capitulation, to Despondency – when the market bottoms.

THE CYCLE OF MARKET EMOTIONS



Source: www.westcore.com

Currently with average cow-calf profits remaining positive, the market probably as further to go before hitting bottom. Expectations are for lower prices in 2017 and 2018 as production continues to increase.

CONCLUSION

Cattle prices are currently in the downturn of the cycle with prices moving back in line with the long-term trend. If the market follows the patterns seen in previous cycles, prices may drop below the long-term trend moving forward and bottom in 2-4 years.

Since the reproductive biology cannot be changed, cattle cycles will continue to occur. However, the cattle cycle is evolving with technology, market information and producer behavior playing an increasingly important role. These factors will continue to influence the dynamic of the current cattle and price cycle.

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