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A Division of the Canadian Cattlemen's Association

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Economic Considerations on Preconditioning Calves

BACKGROUND

What is preconditioning?

Preconditioning is a management method to reduce stress and disease susceptibility and prepare calves to enter the feedlot. Preconditioned calves are weaned at least 30-60 days prior to sale, vaccinated, introduced to feedstuffs, feedbunks and waterbowls. The idea is to spread out the stressors that calves experience: weaning, vaccination, transportation, co-mingling, dietary and environment changes so that the immune system isn't overwhelmed.

Many studies have shown that preconditioned calves have a lower cost of gain at the feedlot with improved rates of gain and feed efficiency as well as lower treatment rates and death loss. Despite these benefits, the adoption rate of preconditioning has been low in Canada with only 9% of cow-calf producers in western Canada preconditioning their 2014 calves for 30-60 days, while 72% sold calves at weaning[1].

Net Returns of Preconditioning

Record high calf prices mean that death losses at the feedlot are that much more expensive. In the US this has resulted in greater interest in animal health and preconditioning programs. But this will only result in adoption by the cow-calf producer if preconditioning is profitable.

The net return associated with preconditioning is the difference between the revenues from selling calves at weaning compared to the returns after a precondition program, less the additional costs associated with preconditioning.

The net returns are calculated as follows:

$$\begin{aligned} &Preconditioning\ Net\ Returns \\ &= Revenues\ from\ Preconditioned\ Calf \\ &- Revenues\ from\ Calf\ Sold\ at\ Weaning \\ &- Costs\ of\ Preconditioning \end{aligned}$$

$$\begin{aligned} &Revenues\ from\ Calf\ Sold\ at\ Weaning \\ &= Market\ Price\ at\ Weaning \\ &\times Weaning\ Weight \end{aligned}$$

$$\begin{aligned} &Revenues\ from\ Preconditioned\ Calf \\ &= Market\ Price\ at\ Preconditioned\ Calf\ Sale \\ &\times (Weaning\ Weight \\ &+ Average\ Daily\ Gain\ during\ Precondition \\ &\times Days\ of\ Precondtion) \end{aligned}$$

For a cow/calf producer, the economic benefit of preconditioning compared to selling calves at weaning mainly comes from the price premiums on preconditioned calves and the additional weight gain during the preconditioning period. On the flip side, the extra costs of preconditioning and the potential price decline due to weight increase and market seasonality can negatively impact revenue.

+	–
Additional Weight Gain Preconditioning Premiums	Feeder Price Seasonal Decline Price Slide on Increased Weight Preconditioning Costs

Prior the implementing a preconditioning program, producers need to estimate the potential benefits and have a good idea of the costs associated with a program to determine if it would be economically feasible for their operation or not.

[1] Source: Wester Canadian Cow-Calf Survey
http://www.wbdc.sk.ca/wcccs.htm accessed Sept 28,2015

DRIVING FACTORS

Preconditioning poses both price and production risk for the cow/calf producer. **Price risk** comes from the uncertainty on feeder cattle price seasonality from weaning time until the point of sale and the uncertainties on the price premium paid for preconditioned calves. **Performance risk** comes from the uncertainty around how calves will perform. What will be their average daily gain, total pounds gained, feeding efficiency and hence the cost of gain during the preconditioning period.

A baseline scenario was selected based on producer surveys in western Canada. Net returns were simulated based on the 10-year (2004-13) average and then again for 2014 to see how the current high price environment changes things.[2]

Baseline Parameters

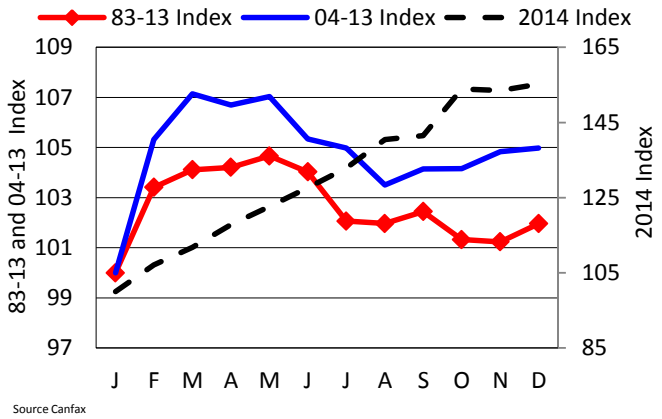
- General Information
  - Province: Alberta
  - Date of birth: 15-March
  - Birth Weight: 85 lbs.
  - ADG from birth to weaning: 1.8 lbs./day
  - Days from birth to weaning: 220 days
  - Weaning weight: 481 lbs.
  - Shrink % calves at weaning: 5%
  - Shrink % of preconditioned calves: 3%
- Preconditioning Cost: $1.10 per pound of gain (range $0.55-1.70 for scenarios)
- Average Daily Gain: 1.8 lbs. per day (range 0.6-3.2 for scenarios)
- Price Premiums: Zero (range $0-20/cwt for scenarios)

Price Seasonality

Seasonally calf prices typically peak in spring with limited numbers and demand for the grass market, then move lower throughout the fall to reach a bottom in October and November as the bulk of calves are weaned and sold at that time. In Western Canada, the majority of calves were weaned in October (42%) and November (32%)[3]. If these calves were sold at weaning, they are likely to hit the seasonal lows, but if they were put on a 30 to 60-day preconditioning program to be marketed in late November or December, prices could strengthen.

While the long-term seasonality provides a baseline for price projection, it is important to note that the calf market has seen more fluctuations in recent years and have not always followed the typical seasonal tendency. In 2014 for example, calf price generally strengthened all year with a modest set back in the fall run. When projecting calf prices, a number of factors need to be taken into account including: the cattle supply situation, the live and feeder cattle futures, basis levels, the Canadian dollar and feed costs.

Seasonal Alberta 550 lb. Steer Calf Index



As bodyweight increases, selling price typically decreases. When considering a preconditioning program, producer must weigh the benefits and costs of selling the calf at a lighter weight at weaning versus selling after a 30-60 preconditioning period at a heavier weight. The historic Alberta feeder steer prices show that the average price slides from the 450 lb to the 550 lb category is -$8/cwt (or 5%), and from 550 lb to 650 lb is -$7/cwt (6%).

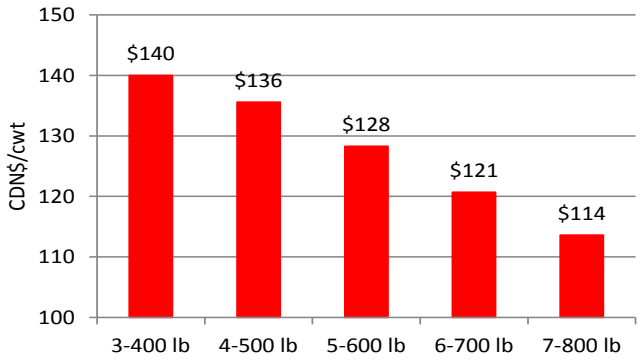
The magnitude of price slide associated with heavier weight is affected by feed costs. When feed prices are lower, cattle feeders see more incentives to turn cheap feed into beef and are willing to pay more for light-weight cattle. Hence, lower feed costs tend to support the price of lighter-weight feeders compared to heavier-weight feeders resulting in larger price slide. On the flip side, high

[2] This analysis utilized the Beef Cattle Research Council's Preconditioning Calculator found at: http://www.beefresearch.ca/research/preconditioning.cfm

[3] Source: Western Canadian Cow/Calf Survey 2014 http://www.wbdc.sk.ca/wcccs.htm accessed Sept 28,2015

feed costs tend to support demand for heavier weight feeders, as weight is put on outside the feedlot. This results in a smaller price slide, as it costs more for cattle to gain weight and cattle feeders are willing to pay relatively more for heavier feeders.

Alberta Steer Prices by Weight Group
(2004-2013 avg.)



For cow-calf producers, the implication is that there is likely higher price risk due to the larger price slide when feed costs are low.

Pricing scenarios and results

Keeping everything at the baseline level with preconditioning cost at $1.10 per pound of gain, average daily gain at 1.8 lb/day and preconditioning premium at zero, the net returns of the 30, 45 and 60-day preconditioning program were simulated under a low price scenario with prices at the 10-year (2004-2013) average and a high price scenario with calf prices in 2014.

In the lower price scenario, the price of a 450 lb steer calf sold in October is estimated at $140/cwt, while a 520 lb steer sold in November is at $132/cwt, 540 lb steer in December at $128/cwt and 570 lb steer in December at $126/cwt.

2004-2013 Average			
	30-day	45-day	60-day
Price ($/cwt)	132.00	128.05	126.16
Value from Weight Gain *($/h)*	81.84	112.93	144.30
Declined from Price Slide *($/h)*	34.36	52.41	61.05
Cost of gain *($/h)*	60	90	120
Net *Return* *($/h)*	-12.52	-29.48	-36.75

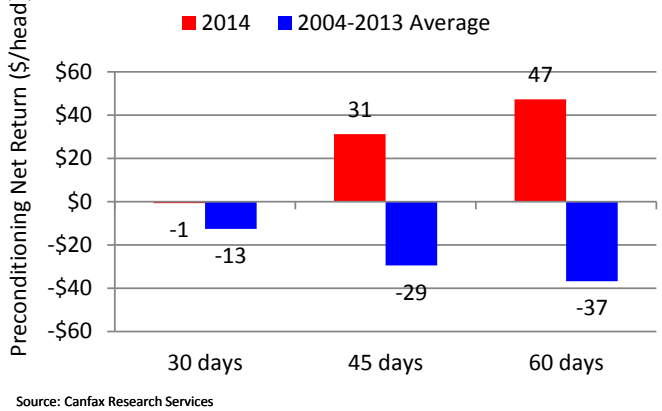
The revenue from each pound of additional weight gain is estimated at about $1.30, which is not enough to cover the total loss due to lower price and additional cost at $1.50/lb. A 30-day program is estimated to lose $13/head and need a 2% premium to breakeven; a 45-day program would lose $29/head and need a 4% premium; a 60-day program would lose $37/head and need a 5% premium.

In the high price scenario, the price of a 450 lb steer calf sold in October is estimated at $322/cwt, while a 520 lb steer sold in November (30-day precondition) is at $295/cwt, 540 lb steer in December (45-day) at $292/cwt and 570 lb steer in December (60-day) at $287/cwt.

2014			
	30-day	45-day	60-day
Price ($/cwt)	295.02	292.20	286.87
Value from Weight Gain *($/h)*	182.91	257.69	328.12
Declined from Price Slide *($/h)*	123.60	136.49	160.85
Cost of gain *($/h)*	60	90	120
Net *Return* *($/h)*	-0.69	31.20	47.28

Given this price level, each pound of additional weight gain in the preconditioning program brings about $3.00 additional revenue. This is large enough to offset the loss associated with seasonality and heavier weight at about $1.50/lb, and costs related to preconditioning at $1.10/lb. The 30-day program can nearly breakeven, while the 45 and 60-day program are profitable with a $31/head and $47/head net return respectively even if there is no price premium.

Impact of Feeder Price on Preconditioning Net Returns



Source: Canfax Research Services

The results suggest that when preconditioning a higher calf price are more likely result in positive net return for preconditioning, when costs and

price premiums are steady. While prices decline as calf body weight increase, the additional revenues from total weight gain are more likely to offset the loss from lower prices in a high price scenario.

Preconditioning Premium

Preconditioned calves tend to experience less health problems in the feedlot and gain weight more efficiently than calves sold directly after weaning. These attributes contribute to higher profits in later phases of beef production and allows cattle buyers to pay a price premium for preconditioned calves.

Premium levels vary and are influenced by cattle prices and the buyer's risk preference. Typically, buyers are willing to pay a higher precondition premium when cattle prices are high because calves are more valuable and there is more incentive to purchase healthier cattle with better feed efficiency and lower death losses.

In the US, premiums for preconditioned calves have increased as cattle price soared to record highs. In Oklahoma, price premiums for preconditioned calves in 2014 averaged $19.20/cwt, more than double the premium of US$8.65 in 2013 and US$9.23 in 2012.[4] Another study in the US reported that in 2014 there was a US$12.06/cwt premium for weaned and vaccinated calves up from a US$4.78/cwt premium in 2013 on 566 lb calves[5].

In Canada, premiums on preconditioned calves are much lower than the US market. A study by Carlberg *et al.* (2013) conducted in Alberta between October 2011 and October 2012 found that the 2,200 calf-aged lots sold around Rocky Mountain foothills during the research period showed no consistent premiums for being preconditioned; and the results based on 8,300 lots of calf-aged cattle sold at locations outside of Red Deer shows that premiums were $1.27/cwt[6].

The lower premiums in Canada may indicate: (1) a lower confidence in the potential value during the later production phase; and/or (2) uncertainties or variations with regards to health and performance of the preconditioned calves due to a non-standard definition used by producers. Premiums are also affected by cattle appearance, seller reputation and marketing channel.

When estimating potential premiums on preconditioned calves, cow-calf producers, especially those preconditioning for the first time, should be aware of the uncertainties associated with preconditioned premiums and should have a good idea of what is the bottom-line premium level that is required to breakeven.

While the scenarios presented in this fact sheet are based on steer prices only, research found that there is a significantly higher premium for preconditioned heifers relative to steers.[7] This finding is likely related to the demand for preconditioned calves as replacement females for rebuilding herds. Therefore gender may be another factor to take into account as the US and Canada move into an expansion phase.

Premium scenarios and results

While a premium for preconditioned calves is obviously a positive factor, the break-even premium required varies with length of the preconditioning period and prices in the general calf market. It essentially offsets some of the seasonal price decline and price slide on heavier selling weight.

Historically, a 1% premium represented a $6-7/head ($1.26-1.33/cwt) increase in the final selling price. As the revenue from weight gain is relatively small, the producer had to rely on price premiums

[4] Based on 4,327 Oklahoma Quality Beef Network registered calves and 6,000 non-certified and/or non-preconditioned calves

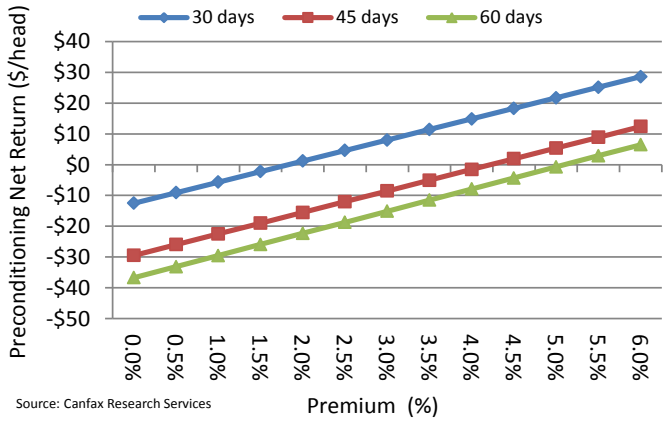
[5] Source: Drovers Cattle Network, Preconditioning Premiums Soar http://www.cattlenetwork.com/advice-and-tips/cowcalf-producer/preconditioning-premiums-soar accessed Sept 16,2015

[6] Source: Jared Carlberg, Robert Hogan, 2013, Factors Affecting Cattle Prices at Alberta Auction Marts, page 12 and 31

[7] Schulz, Lee L., Kevin C. Dhuyvetter, and Beth E. Doran. "Factors Affecting Preconditioned Calf Price Premiums: Does Potential Buyer Competition and Seller Reputation Matter?." Journal of Agricultural and Resource Economics 40.2 (2015): 220-241.

to breakeven. The breakeven premium for a 30, 45 and 60-day program was about $3/cwt (~2%), $6/cwt (~4%) and $7/cwt (~5%) respectively. These premium levels are higher than the ones seen in Alberta during 2011-2012, which implies that producers were not seeing sufficient price premiums to encourage widespread adoption of preconditioning practices.

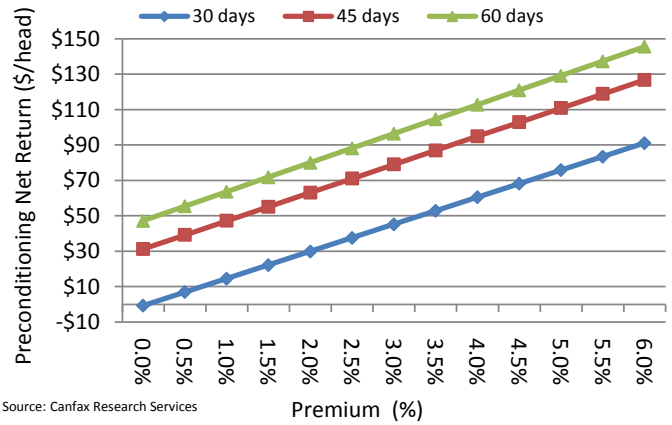
Impact of Preconditioning Premium on Preconditioning Net Return (04-13 avg.)



Source: Canfax Research Services

With 2014 calf prices, a 1% premium represents a $15-16/head ($2.90-3.00/cwt) increase in the final selling price. Since the revenue from additional weight gain is large enough to offset the loss from price slide and costs (see Feeder Price section), the uncertainties regarding preconditioning premiums is less of a concern for producers and any premium would mean additional profits.

Impact of Preconditioning Premium on Preconditioning Net Return (2014)



Source: Canfax Research Services

Average Daily Gain

The economic gains from preconditioning mainly come from the added weight versus calves that are sold at weaning. Hence, average daily gain (ADG) is a critical factor affecting profitability.

ADG is affected by numerous factors such as breed, feed ration, weather, location and so on. Hence it is difficult to predict, especially for producers who have never retained and grown cattle past weaning.

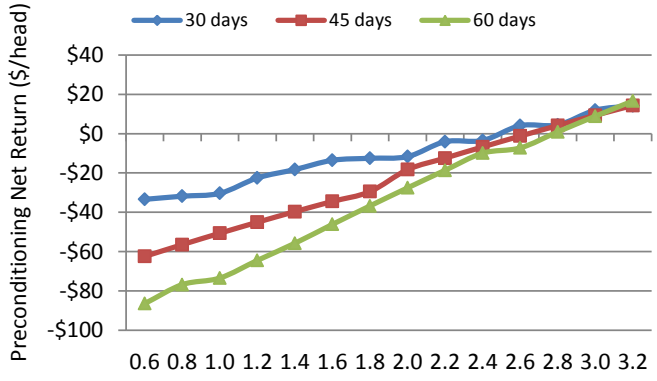
ADG during the preconditioning reported in US and Canada has a wide range from one pound per day up to three pound per day. It is important to recognize the potential risk regarding cattle performance and determine the ADG one could reasonably achieve on their operation.

ADG scenarios and results

As ADG increases the total weight sold increases resulting in more revenue this is offset only slightly by the slide in price on heavier cattle being sold.

Historically, the ADG required to breakeven was about 2.6-2.8 lbs/day, which is at the high end of the ADG reported across North America. This means only the producers with the highest feeding efficiency would be profitable.

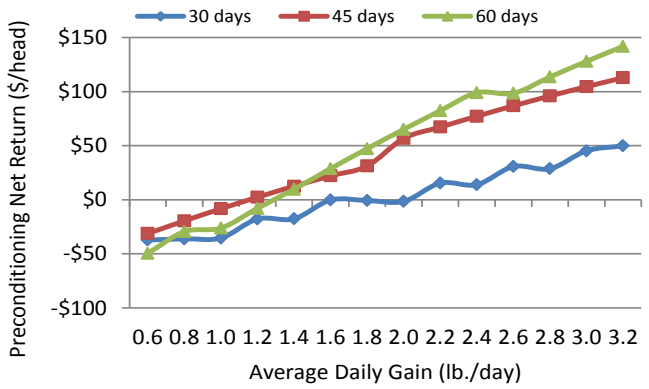
Impact of ADG on Preconditioning Net Returns (04-13 avg.)



Source: Canfax Research Services

At 2014 prices, the ADG required for a preconditioning program to be profitable appears to be relatively easy to achieve. When ADG reaches 1.2 lb/day, a 45-day preconditioning program will be profitable, at 1.4 lb/day, 60-day program profitable, and 2.2 lb/day 30-day program profitable.

Impact of ADG on Preconditioning Net Returns (2014)



Source: Canfax Research Services

The impact of ADG on preconditioning net returns is larger when the feeding period is longer. As shown in the charts, the slop of the 60-day line is steeper than the 45 and 30-day programs. It should also be noticed that ADG is usually relatively lower during the first part of precondition because of stress. This may result in greater production risk associated with shorter preconditioning programs.

Costs

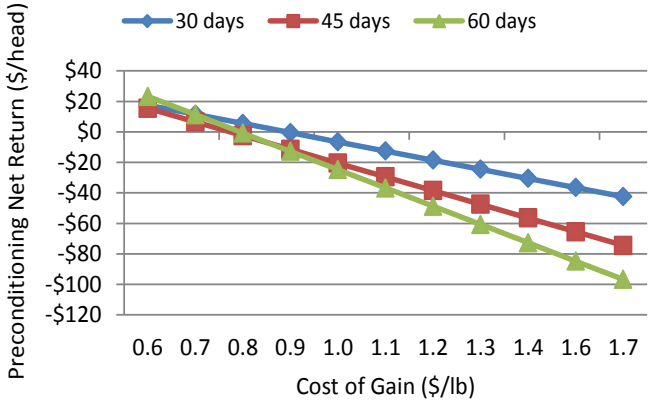
The costs associated with preconditioning include feed, vaccination, yardage, death loss as well as the potential additional marketing costs. Interest should also be taken into account as it represents the opportunity cost on retaining ownership of calves instead of selling at weaning.

While cost structure during the preconditioning period varies across operations with the changes in input prices and management method, feed cost is typically the largest part of precondition costs. When feed cost decline less money is needed to covers costs and the break-even price of preconditioned calf declines. Therefore lower feed price will favor the implementation of preconditioning as producers can turn cheap feed into beef.

Cost scenarios and results

Historically, the break-even cost of gain was $0.70-0.80 per pound of gain. This encouraged retained ownership or preconditioning only when feed was cheap, readily available and producers were looking to add value by feeding calves.

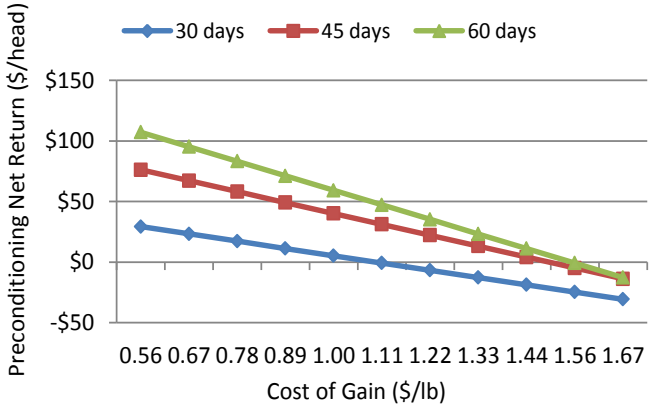
Impact of Preconditioning Cost on Preconditioning Net Return (04-13 avg.)



Source: Canfax Research Services

At 2014 calf prices, a 30-day precondition programs with a cost of gain below $1.10 per pound of gain is profitable, a 45-day program with costs below 1.50 per pound of gain, and 60-day program with costs below 1.55 per pound of gain.

Impact of Preconditioning Cost on Preconditioning Net Return (2014)



Source: Canfax Research Services

It is no surprise to see that when feed costs are low, preconditioning is more likely to be profitable. But we also see that when calf prices are high producers can afford to have a higher cost of gain and preconditioning can still be profitable.

PRECONDITIONING IN 2015?

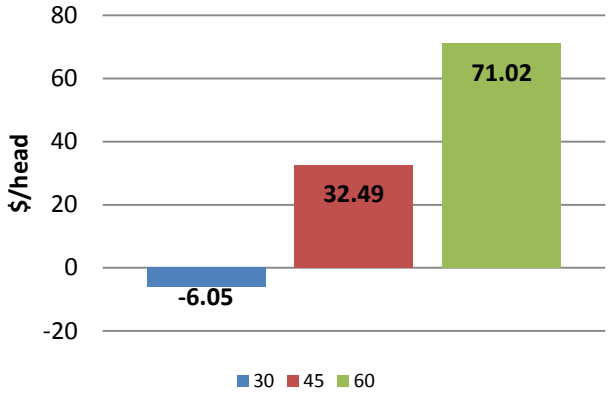
In the first week of October, the average price for Alberta 450 lb steers moved $16/cwt lower to $318/cwt. Assuming prices move seasonally lower in the first half of the month, the price of a 450 lb calf sold at weaning in mid-October is projected to be around $300/cwt.

Cost of gain is projected to be around $1.25/lb (versus the baseline level of $1.10/cwt) and all other variables are held steady at the baseline level (ADG at 1.8 lb, premium at zero). The projected break-even price for a 30, 45 and 60-day preconditioning program are $277/cwt, $270/cwt and $264/cwt respectively.

Projected Break-even Prices			
	30-day	45-day	60-day
Calf weight *(lb)*	519	545	571
Breakeven Selling Price *($/hd)*	1,438	1,472	1,506
Breakeven Selling Prices *($/cwt)*	277	270	264

The 10-year average price slide from October to November and December (including seasonal change and price slide due to heavier weight) at about 8% would suggest calf prices at around $276/cwt in November and December. This will result in a $32/head profit for a 45-day program and a $71/head profit for a 60-day program, while a 30-day program is estimated to have a $6/head loss.

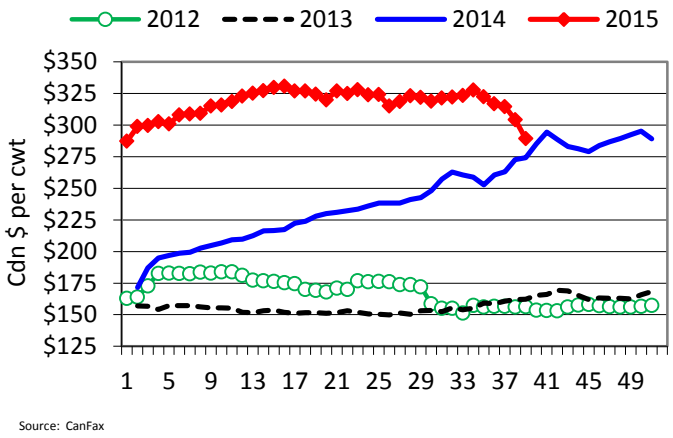
Preconditioning Net Return



Price Risk

However, the nearby cattle future has been on a down trend and the losses have been accelerating. The weakness in the futures will affect calf prices this fall. If calf prices drop below $265/cwt, producers will need to target at a 7% premium for the 30-day program 4% premium for the 45-day program and a 1% premium for a 60-day program to breakeven.

Alberta Weekly 550 lb Steer Price

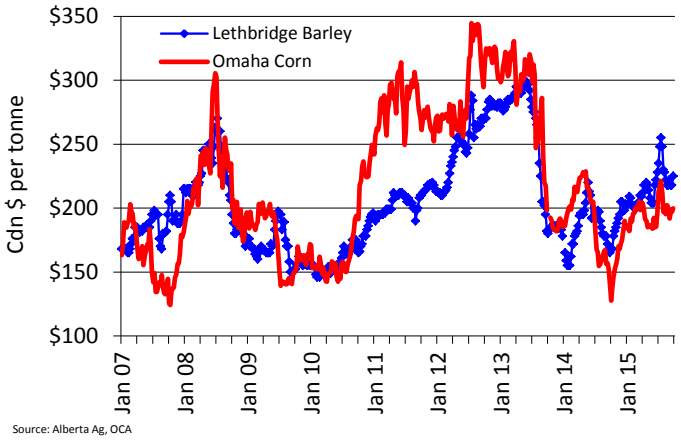


Source: CanFax

Feed costs are expected to increase throughout the fall. In August, Alberta hay prices almost double year-ago level at $174/tons, but prices are expected to ease lower as farmers reported larger than expected yields during second cut later in the summer. Lethbridge barley prices are currently 34% higher than last year. Preconditioning costs in this fall is likely to be higher with total cost per pound of gain is projected at $1.25-1.30/lb.

Feed Grain Prices

Lethbridge and Omaha in barley equivalents



Source: Alberta Ag, OCA

CONCLUSION

In general, preconditioning is more likely to be profitable when calf prices are strong. Higher prices mean each additional pound gained during preconditioning is more valuable. It also supports the feedlot's willingness to pay for a premium on preconditioned calves with increased demand for healthier cattle with better feed efficiency and lower death losses.

Price premiums on preconditioned calves in Canada appeared to be lower compared the US due the lower confidence in the potential value of preconditioned calves and the lack of consensus on the definition of precondition. For the value of preconditioning to be reflected in prices, the industry needs a clear definition of preconditioned calves and a validation system to provide confidence in the health benefits.

Preconditioning is also more likely to be profitable when feed costs are low since producers can turn cheap feed into beef during the precondition period and increase revenue. But producers should also be aware of the risk associated with larger price slides on heavier cattle when feed costs are lower.

Average daily gain is a critical factor affecting precondition profitability. It is important to recognize the potential risk regarding cattle performance and determine the ADG one could reasonably achieve on their operation during the planning phase.

Preconditioning is not for everyone. Producers should consider if they have appropriate feeding facilities, labour to dedicate to weaned calves and expertise support to conduct a precondition program.

Every operation is different. You can use the Beef Cattle Research Council (BCRS) Preconditioning Calculator to evaluate your own costs, production performance and breakeven price needed.

Preconditioning Calculator

The Preconditioning Calculator has four steps including: (1) general calf information, (2) traditional management, (3) preconditioning costs, (4) projected prices for non-preconditioned and preconditioned calves based on weight and seasonal adjustments. Based on the Canfax historical database, the tool allows producers to compare their projections to the 10 year provincial average. A summary of estimated net returns and projected breakeven price premiums are provided for three different precondition programs (30, 45, 60 days).

http://www.beefresearch.ca/research/preconditioning.cfm