

An Economic Review of Preconditioning Beef Calves to Reduce Incidence of Bovine Respiratory Disease

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Bovine Respiratory Disease Complex Series



FAST FACTS

- Effective pre-conditioning programs decrease stress on calves, increase the value of weaned calves and promote calf growth efficiency.

Preconditioning is a calf management program to prepare weaned calves to enter a stocker operation or be placed directly in a feed yard. Preconditioning activities include: implementation of an animal health protocol for vaccinations and parasite control, dehorning, castration, weaning, and transitioning calves to a roughage and grain ration fed in feed bunks for a specified feeding period. Precondition costs incurred by the cow-calf producer are recovered through price premiums from selling value-added preconditioned calves, calf weight gain over the preconditioning feeding period and potential seasonal price improvement. In some cases, producers recapture preconditioning costs through the improved efficiency of their calves in a retained ownership venture.

The purpose of this fact sheet is to summarize information on preconditioning programs as well as critical economic factors affecting preconditioning profitability for cow-calf producers. Effective preconditioning programs decrease stress on calves, increase the value of weaned calves by enhancing calf immune system function and decreasing disease morbidity and mortality losses, and promote calf growth feeding efficiency in the stocker or feed yard operation. Feed yards and stocker operations source preconditioned cattle as a primary management tool to decrease the incidence of bovine respiratory disease (BRD).

Preconditioning is not a new calf management concept. It has been identified as an economic issue as early as 1967 in a preconditioning seminar to "... discuss the problems and scientific basis for developing a preconditioning program ... and to share their research findings and ideas because of the widely felt need to reduce the huge dollar losses which occur today in newly arrived feedlot cattle" Gill (1967). Preconditioning has become more important be-

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- Advantages of preconditioning: Reduce disease morbidity and mortality and improved ADG.
- Preconditioning typically refers to a minimum of 45 days on feed post weaning.
- Feeding accounts for the majority of preconditioning production costs.

cause of the increased financial risk associated with feeding cattle. The ongoing increases in feeder cattle price, feed costs and number of cattle on feed within a feed yard to gain economies of size, coupled with the decrease in fed cattle net margins, all combine to increase the financial risk of feeding cattle. Sourcing preconditioned calves is receiving more attention to better manage disease risk and improve cattle production efficiency post weaning. Reviews evaluating preconditioning programs indicated production advantages for preconditioning. Duff and Galyean (2007), and Step et al. (2008) indicated that preconditioning programs reduced disease morbidity and mortality and improved average daily gain (ADG) when preconditioned animals were placed into the feedlot. As a result, cattle buyers may pay a premium for preconditioned cattle that are perceived to be more economically efficient. However, the question remains if the preconditioning costs and additional time invested into the preconditioning program are economically feasible for cow-calf producers.

Preconditioning economics for the cow-calf producer

Preconditioning programs have variable definitions regarding days on feed after weaning and health program protocols. There can be substantial differences in costs and effectiveness of the various programs. Preconditioning typically refers to a minimum of 45 days on feed post weaning. Preconditioning periods less than 30 days generally do not produce enough weight gain to offset production costs, immunological response to vaccinations may not be complete, and calves may not have fully recovered from the stress of weaning (Thrift and Thrift, 2011). Some preconditioning value-added programs require a minimum of 60 days on feed; see for example the Superior Livestock VAC PRECON program, <http://www.superiorlivestock.com/value-added-programs/superior-vaccination-programs> and the Western Video Market Feeder Vac program, <http://www.wvmcattle.com/site/index2.htm>. In addition to variable feeding periods, calf health protocols differ in the specific vaccinations required and when they have to be administered. Typically, documentation of the preconditioning program is an affidavit provided at the time of sale.

Feeding Costs and Weight Gain

Feeding accounts for the majority of preconditioning production costs. The preconditioning ration will differ for each operation based on availability and cost of feedstuffs. For calves weaned in the fall and fed for 45, 60 or more days through the winter, roughage needs to be provided by hay, silage or some type of winter forage. The price variability of feedstuffs has increased dramatically over the past five years. This may provide an economic advantage to ranches that can self-produce feedstuffs and a disadvantage to ranches purchasing feedstuffs. Feeding costs will be unique for each ranch considering preconditioning and will change each year as market conditions change. Because of this price variability, an economic feasibility analysis will need to be completed each year as preconditioning is considered.

An effective nutritional program provides a desirable level of growth performance during the preconditioning period but weight gain can be highly vari-





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- Preconditioning rate of gain has been classified as low (ADG < 1.5 lbs/day), medium (ADG 1.5-2.5 lbs/day) and high (ADG > 2.5 lbs/day).
- Properly administered preconditioning health programs decrease disease morbidity and mortality losses.
- Health programs require: vaccination (following label instructions) and parasite control.
- Marketing preconditioned calves to obtain a value-added premium is the most critical component of economic success.

able between ranches. Calves typically lose weight following weaning, but weight loss will be affected by the ranch's ability to use a low stress weaning system or if calves are weaned and shipped to the preconditioning facility. Preconditioning rate of gain has been classified as low with ADG < 1.5 pounds per day, medium between 1.5 and 2.5 pounds per day and high with > 2.5 pounds per day, see <http://www.cattlenetwork.com/cattle-resources/preconditioning/Preconditioning-nutrition-programs-120294849.html?view=all> and Lalman et al. Preconditioning weight gain will be variable year-to-year and between ranches and will be affected by calf health, stress, weather, pre-weaning nutrition, genetic potential for growth, preconditioning ration quality, and the use of feed additives and implants.

Health Cost

In the 2007 national survey of beef cow-calf management practices, APHIS reported that 35 percent of cow-calf operations did not vaccinate calves for respiratory disease prior to sale. This is likely due to the management problems of gathering cattle and then processing them for vaccinations with sufficient time for the calf to develop a proper immunological response prior to sale. The APHIS survey also reported that 15.7 percent of cattle placed in feed yards were affected with bovine respiratory disease with an estimated treatment cost of \$41.55 per animal. Properly administered preconditioning health programs decrease disease morbidity and mortality losses. Buyers are willing to pay premiums for preconditioned calves, recognizing that the extra cost of a preconditioned calf may be more than offset by reduced sickness, lower medicine costs, decreased labor requirements, improved feeding efficiency and higher carcass quality. Health programs typically require vaccinations at branding, prior to or at weaning and a booster per label instructions prior to sale with sufficient time to develop an adequate immune response to handle transportation and comingling stress. Parasite control is required for some programs and recommended for others.

If considering preconditioning, it is important to know the required health program protocol of the preconditioning sale or value added program. The programs differ according to regions, sale, calf origin (home raised or comingled from multiple sources) and the number and timing of vaccination doses required to develop a proper immune response.

Marketing is the Key to Economic Success

Although preconditioning costs and calf weight gain are important, marketing preconditioned calves to obtain a value-added premium is the most critical component of economic success. Preconditioning is associated with improved production efficiency, but buyers will pay no more for calves than a competitive buyer forces them to pay. Ranchers seeking to obtain preconditioning price premiums will have to market their calves through negotiated forward contract sales, or special sales where consigned cattle are preconditioned. These sales allow buyers to take

FAST FACTS

- Seasonal price change should be considered when negotiating forward contract terms or evaluating preconditioning economics.

advantage of preconditioning programs by purchasing truckload lots and comingling cattle of like type. Preconditioning efficiencies are lost if a feed yard has to comingle non-preconditioned calves into the lot. For a possum-belly cattle trailer, a truckload lot will be about 48 finished preconditioned steers or heifers.

Seasonal price change is a marketing factor to consider when negotiating forward contract terms or evaluating preconditioning economics. For fall weaned calves, prices increase after October when a large number of calves are weaned and sold. As an example, Table 1 presents the past five years of Washington steer auction prices for the months and weights likely involved in a fall weaned preconditioning program. The yellow highlighted cells are prices associated with October weaning and the following 45 and 60 day preconditioning program marketing points. Additional months and weights are provided for reader convenience in analyzing alternative preconditioning scenarios. Table 1 shows the increasing price trend in the cattle market over the past five years. Prices for feeder cattle declined in 2012 primarily due to the record high price of corn.

Table 1. Washington Feeder Steer Auction Price

	Month	Feeder	Feeder	Feeder	Feeder
		Steers	Steers	Steers	Steers
		4-500	5-600	6-700	7-800
		\$ / cwt			
2008 Fall Weaned	Oct-08	94.12	89.35	86.91	86.19
	Nov-08	100.91	89.55	85.27	83.11
	Dec-08	94.43	88.94	83.89	81.52
	Jan-09	97.52	91.13	88.96	86.70
	Feb-09	103.72	102.79	90.70	86.41
2009 Fall Weaned	Oct-09	100.22	92.19	90.13	87.51
	Nov-09	106.74	96.49	94.50	87.94
	Dec-09	114.64	100.60	91.14	87.01
	Jan-10	113.96	104.83	97.80	92.24
	Feb-10	121.00	114.03	105.64	97.77
2010 Fall Weaned	Oct-10	127.48	117.58	114.45	108.27
	Nov-10	133.82	121.01	111.85	107.46
	Dec-10	133.39	123.85	117.50	111.53
	Jan-11	149.48	137.70	125.77	119.96
	Feb-11	153.18	148.76	135.41	125.53
2011 Fall Weaned	Oct-11	149.91	139.08	135.67	124.07
	Nov-11	148.83	141.49	131.89	123.94
	Dec-11	158.23	143.97	138.25	130.11
	Jan-12	176.38	163.37	145.89	140.13
	Feb-12	184.18	176.45	161.25	148.97
2012 Fall Weaned	Oct-12	167.22	150.81	144.13	137.10
	Nov-12	166.87	143.73	137.37	127.95
	Dec-12	162.85	146.07	136.10	126.45
	Jan-13	165.83	152.84	140.74	137.48
	Feb-13	168.60	160.05	144.78	136.26

FAST FACTS

- The average per head revenue from 2008-2012 was \$50.62 and \$106.23 for the 45- and 60-day feeding period, respectively.
- Shrink is an important factor to consider when negotiating sale prices.

Table 2 provides marketing revenue calculations for selling a 550-pound weaned steer in October and for each of the 45- and 60-day preconditioning periods. The 60-day preconditioning period assumes the steer is held to be sold in January to take advantage of increased prices. The calculation for each year in the top row is the total market revenue less 3% shrink and the number below is the marginal revenue change between October and selling the finished preconditioned steer with 1.5 pounds ADG. From 2008 to 2011, there was an increasing trend in the revenue received from the projected weight gain and seasonal price increase. For the 45-day feeding period, the per-head revenue increased from \$25.80 to \$86.09, and for the 60-day period it increased from \$75.58 to \$163.69. In 2012, the feeder calf revenues decreased as the 2012 corn price increased. The average from 2008 through 2012 was \$50.62 and \$106.23 for the 45- and 60-day feeding period, respectively.

Table 2. Preconditioning Sale Revenue Analysis Using Historic Prices

Year	Weaned Oct	45-Day preconditioning	60-Day preconditioning
		ADG = 1.5 Dec	ADG = 1.5 Jan
	Weight lbs 550	618	640
	Shrink % 3%	3%	3%
Sale revenue and change \$/head			
2008	\$476.68	\$502.48 \$25.80	\$552.26 \$75.58
2009	\$491.83	\$545.91 \$54.07	\$563.07 \$71.23
2010	\$627.29	\$703.80 \$76.51	\$780.78 \$153.49
2011	\$741.99	\$828.08 \$86.09	\$905.69 \$163.69
2012	\$804.57	\$815.20 \$10.63	\$873.71 \$69.14
Average	\$628.47	\$679.09 \$50.62	\$735.10 \$106.63

When negotiating for and evaluating the price premium for preconditioned steers, the market price trends and values shown in Table 2 should be considered as market adjustments. The price premium for improved production efficiency and for recapturing preconditioning production costs should in part be added to these commercial auction prices; weight gain price slide found in cattle markets reflects the increase in value as feeder cattle increase in size. Table 2 assumed an ADG of 1.5 pounds per day. If a preconditioning program is able to achieve greater gains, the seasonal price revenue adjustment will be higher. The table assumes a 3% shrink. Lower shrinks have been reported for preconditioned calves. Shrink is an important factor to consider when negotiating



FAST FACTS

- Partial budgeting can be used to determine the added costs of a preconditioning program.
- A cow-calf producer should develop a firm marketing plan.



sale price for preconditioned calves. The revenue effect of the negotiated shrink percentage increases as calves increase in weight and number sold is based on truckload lots.

Partial Budgeting to Evaluate Preconditioning Economics

Partial budgeting is an economic tool that can be used to evaluate costs versus benefits of a change in production methods. Partial budgeting can be used to determine the added costs of a preconditioning program compared to the increased value-added market sales to determine net gain or loss. An example of a preconditioning budget spreadsheet is available at <http://beefextension.com/new%20site%202/cccalc.html>. Thrift and Thrift (2011) provide an historic review of eleven studies analyzing preconditioning premiums. The report compares price premiums for calves that received some degree of preconditioning before sale relative to non-preconditioned calves and comparative net profit for preconditioned calves across studies. The studies analyzed ranged in date from 1985 to 2010 and had variable preconditioning program protocols. There is a high range in price premiums and net profit across the analyzed studies. The studies are interesting to review because they show cattle buyers are willing to pay premiums for preconditioned calves and identified the importance of a certified preconditioning protocol. Preconditioning net profitability is highly dependent on calves' ability to gain weight efficiently relative to cost of and quality of feedstuffs.

Conclusion

Preconditioning has long been an issue of economic importance to cow-calf, stocker and feed yard operators. There are no economic rules of thumb that can be applied to preconditioning programs because of their high variability in protocols, application between ranches, ability of cattle to gain efficiently and market price volatility year-to-year. Preconditioning programs increase production and market risk for cow-calf producers. However, stocker and feed yard operations increasingly recognize different disease and production risk attributes across sources of cattle and the improved efficiency of preconditioned cattle. Cattle buyers have been shown to be willing to pay price premiums for preconditioned cattle. As the financial risk of feeding cattle increases, there will be increasing interest in sourcing preconditioned cattle.

A key factor for a cow-calf producer considering a preconditioning program is to develop a firm marketing plan. The least risk plan would be to develop a forward contract with a cattle buyer with the sale price and the preconditioning program well defined by the contract. Alternatively, producers can plan to consign calves to certified preconditioned sales where cattle buyers have a sufficient number of head to comingle truckload lots and pens to create like sex, weight and genetic type groups that have low disease risk.

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