

Calf Management: Weaning to Shipping

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“Backgrounding” is a management approach designed to prepare young cattle to best withstand the physical and psychological stresses of shipping and entering the channels of trade. Weaning, shipping, commingling, and dietary change can all impose significant stress on cattle, potentially causing reduced performance and increased sickness. A critical component of backgrounding is a well-planned vaccination program to help calves develop a strong immune system before a substantial disease challenge occurs. It is important to minimize stress to give calves the best opportunity to respond to vaccines and develop the immune response capabilities necessary to fight disease challenges that typically occur following shipping.

Stress management in cattle has two major components: (1) management of the cause of stress and (2) management of the quantified changes seen in the animals caused by stress. The most stressful time in the life of most calves that follow the conventional marketing channels is from weaning through the first month in the feedlot. Steps can be taken by producers to minimize stress in calves prior to and during the weaning process, and between weaning and shipping. Such actions can enhance subsequent performance and profit.

This paper will address weaning and post-weaning management approaches to minimize stress in calves prior to shipping. Vaccination guidelines will not be discussed; however, producers are encouraged to consult their veterinarian to develop a total herd health program that is most practical for their cattle and management system.

Weaning Considerations

Weaning is one of the most stressful events in a calf’s life. Minimizing weaning stress can yield improved calf health and weight gain. The primary stressors that can affect calves at weaning are separation from their mother and moving to a new environment. When evaluating potential weaning methods, facilities, labor, and feed resources should be considered. Producers should then decide which protocol within the resource parameters is most likely to minimize stress on the cows and calves, yet cost-effectively best prepare the calves for the next stage of production.

Fenceline Weaning

California researchers conducted a three-year study to compare weaning calves while allowing fenceline contact with their dams (fenceline-weaning) to non-weaned calves or calves weaned and completely separated from their dams. Results of this study (Table 1) indicate that fenceline-weaned calves show less behavioral stress (time spent eating, walking, and resting) than calves abruptly separated from their dams. During the first three days after weaning, calves weaned on pasture away from their dams were observed walking almost 3-fold more frequently and bawled twice as often compared to fenceline-weaned calves. Additionally, fenceline-weaned calves spent more time eating and resting. Aside from

bawling, fenceline-weaned calves exhibited similar behavior to non-weaned control calves. Seven days after weaning, all weaned calves in the study were managed together. Fenceline-weaned calves gained 95% more during the first two weeks after weaning than calves totally separated from their dams (47 vs. 24 lb gain, respectively), and retained the weight advantage through 10 weeks post-weaning.

Table 1. Average percentage of observations in which calves exhibited various behaviors on days 1 through 3 (yr 1, 2, 3) and average cumulative weight gain at 2 and 10 weeks post weaning (yr 1 and 3; Price et al., 2003).

	Not Weaned	---Pasture Weaned---		---Drylot Weaned---	
	Control	Fenceline Contact	No Contact	Precon. to Hay	No-Precon to Hay
Behavioral	-----% of observations-----				
Eating	41 ^a	37 ^a	24 ^{bc}	29 ^b	22 ^c
Walking	9 ^a	10 ^{ab}	28 ^c	10 ^{ab}	15 ^b
Resting	23 ^a	23 ^a	16 ^b	22 ^a	21 ^{ab}
	-----# vocalizations/hour-----				
Bawling	0.1 ^a	216.7 ^b	434.6 ^c	371.2 ^{bc}	518.2 ^c
Performance	-----weight gain (lb)-----				
Weaning – 2 wks	44 ^a	47 ^a	30 ^b	23 ^b	20 ^b
Weaning – 10 wks	143 ^a	110 ^b	91 ^c	79 ^c	82 ^c

^{abc}Means with different superscripts within rows differ P<0.05

In 2006 and 2007, beef calves at the Corona Range Livestock Research Center were fenceline weaned for 7 days. Other than the challenges associated with keeping cows and calves separated with marginal fencing, the experience has been positive. During both years calves gained weight during the 7-day fenceline weaning period (Table 2). It is important to note that during both years gathering calves required less time at the end of the 7-day period, so calves likely had slightly more fill at the end of the 7-day period than on the day they were weaned. Nevertheless, calves maintained their body weights, and outward signs of stress were minimal.

Table 2. Performance of fenceline-weaned calves at the NMSU Corona Range Livestock Research Center

Year	Weaning Wt.	7-Day Post-weaning Wt.	Difference
2006	468	484	16
2007	520	524	4

Allowing fenceline contact between calves and their dams for four to seven days after weaning can lessen stress and minimize post-weaning performance decline. However, it may not always be possible to fenceline wean calves. In situations where fenceline weaning is impossible or impractical, cost-effectively minimizing stress is still important.

Tips to Minimize Stress from Weaning to Shipping

- Provide calves access to the weaning area (pen, trap, or pasture) a few weeks prior to weaning so calves do not undergo the stress of environment change at weaning.
- Allow fenceline contact between calf and dam for four to seven days following weaning. Fences should be sturdy and allow nose to nose contact while preventing nursing.
- If fenceline contact is not practical, move cows far enough that they cannot hear the calves bawling.
- Move the cows to a new location when cows and calves are separated at weaning. Do not move the calves.
- If weaning in a drylot or corral, place feed bunks, hay, or water troughs along the fence to minimize perimeter walking.
- Do not castrate, dehorn, or brand calves at weaning. These practices should be completed at least three weeks before weaning and preferably prior to three months of age.

Duration from Weaning to Shipping

Since weaning and shipping are both stressful events in a calf's life, the duration from weaning to shipping is important. By separating these stressors, the combined immunosuppressive impact may be reduced. The number of days separating weaning and shipping (i.e., 45 days or more), when combined with a sound vaccination protocol, adds value to calves and is rewarded in the marketplace. In fact, price premiums for "VAC-45" calves marketed through Superior Livestock Auction video sales increased every year from 2000 to 2004, with annual average price premiums ranging from \$3.66 to \$7.91/cwt (King and Seeger, 2005). Justification for such premiums are supported by the analysis of New Mexico Ranch to Rail data which showed that steers weaned 41 days or more before entering a feedlot generated greater net income during finishing than steers backgrounded 21 to 40 days, or less than 20 days (Figure 1). These findings also support the premise that implementing a backgrounding program of 45 days or more improves finishing profit potential. However, studies evaluating backgrounding calves have typically focused on programs less than 40 days, and controlled experiments evaluating the impact of different backgrounding approaches on performance and profit through harvest are limited.

Post-weaning Management Approaches

Ranch resources, management programs, cattle-types, and potential markets vary, so a single post-weaning management program does not fit all operations or market environments. Producers must define their objectives before implementing a post-weaning management program. For example, a producer may background calves with the intent of selling for a premium immediately after backgrounding, being most interested in low-cost gain. On the other hand, a producer may plan on retaining ownership of calves and choose to background calves for the sole purpose of optimizing calf health and condition to improve overall performance and profit through harvest; therefore, being less interested in weight gain during backgrounding. The backgrounding approach may be vastly different for these two scenarios.

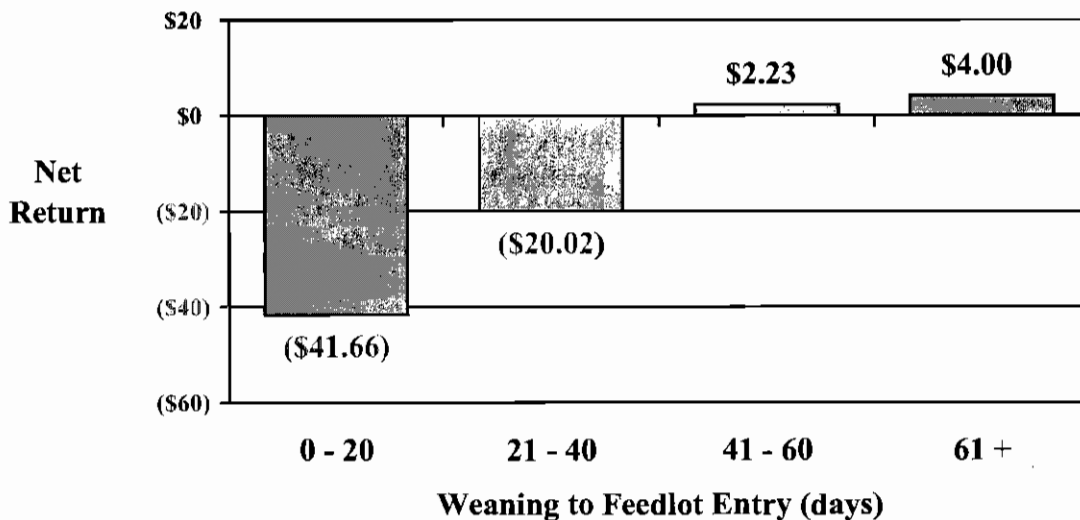


Figure 1. Impact of time separating weaning and feedlot entry on net return of steers in the New Mexico Ranch to Rail program from 2001 to 2004

Generally, pasture-based backgrounding programs are the least stressful because the environmental change from pre-weaning to post-weaning is minimal. However, calves can be fed a forage-based or concentrate-based backgrounding ration and confined to a drylot for the entire backgrounding period. Some trade-offs between backgrounding management approaches exist.

Pasture Backgrounding
+ less environmental change
+ less dietary change
+ less dust or mud control
+ lower cost
- often less gain
- not trained to eat from bunk

Drylot Backgrounding
+ often more gain
+ trained to eat from a bunk
- greater environmental change
- more dust or mud control
- greater feed cost

Since premiums are paid for backgrounded calves, but very few controlled studies evaluating differences in post-weaning management approaches have been reported, a study at NMSU was conducted to compare low-input pasture backgrounding approach to a high-input drylot backgrounding approach. In this study performance and profit were evaluated during the backgrounding and finishing phases. An overview and results of are below.

NMSU Pasture vs. Drylot Backgrounding Study

Over 3 years, 250 calves were used to compare a low-input pasture backgrounding system to a high-input drylot backgrounding system. Performance and profit of calves during the backgrounding and finishing phase were evaluated. Treatments: 1) **high-input drylot**

backgrounding system (corn/wheat midds-based pellet plus 1.5-2.5 lbs of alfalfa hay/day) or 2) **low-input pasture backgrounding system** (native range pasture plus 1.25 lb/day of a 32% CP range cube delivered 3x/week). All calves qualified as "VAC-45", but premiums for backgrounding were not applied to prices. After backgrounding, all steers were fed at a commercial feedlot, then sold on an individual carcass basis

Results: Backgrounding Phase. The drylot backgrounded calves gained 0.32 lb/day more during backgrounding, and were worth \$6.90/hd more. The higher value of the drylot backgrounded calves was offset by \$52.76 greater cost for drylot backgrounding. Consequently, net income during backgrounding was \$44.59 greater for pasture backgrounded calves even though they gained less weight than DLOT calves. A final price premium of \$5.00/cwt would have been required for the drylot backgrounding system to be profitable in the market conditions of the study; however, the pasture backgrounding system was profitable without a premium.

Results: Finishing Phase. There were no differences in overall feedlot ADG, finished body weight, DOF, or any measured carcass characteristics. There was a tendency for drylot backgrounded steers to have more sickness (48% vs. 34%) than pasture backgrounded steers. The drylot backgrounded steers also had greater death loss (7.6% vs. 0%), indicating that the drylot backgrounded steers likely experienced some degree of suppressed immune function as compared to pasture backgrounded steers. During finishing, the pasture backgrounded steers profited \$103/hd more than the drylot backgrounded steers. Approximately \$70/hd of the profit difference between treatments resulted from death loss, and the remaining \$33 difference occurred primarily because pasture backgrounded steers had numerically greater carcass weight and prices than drylot backgrounded steers.

In summary, the pasture backgrounding system yielded more profit during both the backgrounding and finishing phases. Additional research is currently being conducted to compare different pasture-based approaches (self-fed vs. cake).

Ohio Comparative Weaning/Backgrounding Study

Recently a study was conducted in Ohio that compared health performance of 1) shipping calves at weaning, 2) calves backgrounded for 30 days on pasture (fescue pasture + supplement) with fenceline contact to their dams for the first 7 days, and 3) calves backgrounded for 30 days in a drylot (hay + supplement) with not contact to dams. Calves were placed in a feedlot following weaning or backgrounding and monitored for 28 days. During the 28-day receiving period, 15% of the pasture backgrounded/fenceline weaned calves were treated for sickness, whereas 28% of the calves shipped at weaning and 38% calves backgrounded in a drylot were treated for sickness. The fenceline-weaning, pasture-based backgrounding approach better prepared calves to withstand the immune challenge they faced during the feedlot receiving period.

There are differences of opinion in the industry regarding how calves should be managed between weaning and shipping. It is also clear that management approaches that work well for some calves may not be the best approach for calves from a different source, management system, or region. However, there is mounting scientific evidence indicating

that keeping calves on pasture between weaning and shipping may render calves more competent to withstand subsequent immune challenge.

Table 3. Impact of backgrounding system on performance and profit during the backgrounding and finishing phases (NMSU Study)

Item	Backgrounding System	
	Drylot	Pasture
Backgrounding Phase		
# of head	125	125
ADG, lb/day	1.42	1.10
Total Cost, \$	66.77	14.01
Net Income, \$ ^a	(28.87)	15.72
Finishing Phase		
# steers	66	67
% Treated for sickness	47.6	34.3
% Death loss	7.6	0.0
Net Income, \$	(98.33)	4.68

^aA "VAC-45" price premium was not included in the analysis

Summary

Common events like branding, weaning, shipping, and receiving at a feedlot are stressful to calves. Producers should take steps to minimize stress to calves prior to shipping. Reducing stress influences the health and well-being of calves, ultimately enhancing the potential for improved performance. To minimize stress of weaning, producers are encouraged to consider allowing fenceline contact between the cow and calf for a few days following weaning. Producers are also encouraged to consider backgrounding calves prior to shipping to separate weaning and shipping stress, and allow the immune system to more fully respond to vaccination prior to commingling. A sound vaccination program is critical to preparing calves for disease exposure that is likely to occur at the commingling point, and should be developed in consultation with a veterinarian.