

LOW STRESS WEANING AND PRECONDITIONING CONSIDERATIONS

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Introduction

There are several sources of stress that can impact cattle throughout their lives. Sources of stress like branding, weaning, shipping, and feedlot entry are predictable events and to some extent can be managed. 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 (NRC, 1996). 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. Granted, for some calves that are grown on pasture prior to entering the feedlot there may be a period of relatively low stress while on grass. Nonetheless, steps can be taken by producers to minimize stress of calves prior to, and during the weaning process, and also prior to shipping and feedyard entry. Reducing stress influences the health and well-being of the animal, ultimately enhancing the potential for improved animal performance.

This paper will discuss concepts and strategies for weaning and preconditioning beef calves to minimize stress and improve calf performance.

Weaning Considerations

Weaning is one of the most stressful events in a calf's life. Practices that minimize stress during this time can yield improved calf health and weight gain. When calves are weaned they have two main stressors that can affect them: (1) separation from their mother and (2) moving to a new environment. When evaluating potential weaning methods, producers should evaluate their facilities and resources. Then, producers should decide which protocol within the resource parameters is most likely to cost-effectively minimize stress on the cows and calves, yet best prepare the calves for the next stage of production.

Research comparing methods for weaning cattle is limited; however a few studies do shed some light on the subject. California researchers (Price et al., 2003) conducted a three-year study to compare weaning calves but allowing fenceline contact with their dams to non-weaned calves or calves weaned and completely separated from their dams (Table 1). Results of this study indicate that fenceline-weaned calves show less behavioral stress than calves abruptly separated from their dams, and gain more weight through 10 weeks post-weaning.

Allowing fenceline contact between calves and their dams for several 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, producers should make every effort to minimize stress. Tips for minimizing weaning stress are listed.

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- Provide calves access to the weaning area (pen, trap, or pasture) a few weeks prior to weaning so calves do not have to undergo the stress of environment change at weaning.
- Provide shelter from wind and sun.
- Allow fenceline contact between calf and dam for three to seven days following weaning. Fences should be sturdy and allow nose to nose contact without 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 3 weeks before weaning and preferably prior to 3 months of age.

Preconditioning Considerations

Preconditioning is a vaccination, nutrition, and management program designed to prepare young cattle to best withstand the physical and psychological stresses of shipping and entering the channels of trade. These programs allow calves to adapt to life without their dam while minimizing stress. Plus, preconditioning includes preventative health management to help the calf develop a strong immune system before stresses of transportation, commingling, etc. occur. Preconditioning calves prior to shipping has been effective at minimizing sickness and death loss of calves in the feedyard. Weaning and preconditioning are generally linked because the preconditioning program often begins at or prior to weaning. The preconditioning phase separates the stresses of weaning from those of transportation and feedlot entry, and in many cases helps train the calves to eat dry feed from a bunk to aid transition from forage to a grain-based diet.

Ranch resources, management programs, cattle-types, and potential markets vary, so a single preconditioning program does not fit all operations or market environments. Producers must define their objectives before implementing a preconditioning program. For example, a producer may precondition calves with the intent of selling for a premium immediately after preconditioning, being most interested in low-cost gain. On the other hand, a producer may plan on retaining ownership of calves and precondition 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 preconditioning. The approach to preconditioning may be vastly different for these two scenarios.

Generally, pasture-based preconditioning programs are the least stressful because the environmental change from preweaning to postweaning is minimal. However, calves can be fed a forage-based or concentrate-based preconditioning ration and confined to a drylot for the entire preconditioning period. Regardless of whether calves are kept in

confinement or pasture, it is imperative they have a palatable and balanced diet. Calves eating a balanced diet will be more likely to develop the immunity needed at the feedlot, especially if they are to be commingled with calves from other sources.

The duration of a preconditioning program is important to success. Recent work conducted at New Mexico State University evaluated the impact of preconditioning duration (days from weaning to feedlot entry) on feedlot performance and profitability among steers in the New Mexico Ranch to Rail program from 2001 to 2004. Results indicate that peak average daily gain (Figure 1) and profitability (Figure 2) in the feedlot was achieved when calves were weaned at least 41 days prior to entering the feedlot. These results support the commonly practiced VAC-45 program which requires calves to be preconditioned a minimum of 45-days before leaving the ranch.

Tips to Minimize Preconditioning Stress

- Clean water is essential.
- Provide shelter from wind and sun.
- If preconditioning in a drylot:
 - use water sprinklers or a sprayer to minimize dust as appropriate without creating muddy conditions
 - provide highly palatable forage initially, then maintain forage at no less than 20% of the diet
- If preconditioning on pasture:
 - If pasture is fall/winter native range, provide supplemental protein at about 0.4 pounds crude protein per day. This can be achieved by feeding 1 pound of a 40% protein supplement or 2 pounds of a 20% protein supplement. Supplement can be prorated and fed three times per week to deliver the same amount of protein over seven days.
 - If preconditioning on pasture in late summer or early autumn when native range forage is still green, no supplement is needed.
 - Familiarize the calves with people by frequently checking the calves in a non-threatening manner.

Preparing the Immune System

The success of a preconditioning program often is measured by the level of sickness observed in calves after they reach the feedyard. Minimizing stress due to weaning and environmental change, while providing good nutrition is important to the success of any vaccination program. Producers are encouraged to consult their veterinarian to develop a health program that is most practical for their cattle and management system. If possible, vaccinate calves for respiratory diseases two to three weeks prior to weaning, followed by a booster at weaning. Otherwise, give an initial respiratory vaccine at weaning and booster two to three weeks later. Below are specific vaccination program options (http://okcattlemen.org/OQBN_Pages/vac_options.html)

that could be employed as an integral component of a preconditioning program. Always read and follow label directions.

Vaccination Schedule

Option 1: Pre-Wean / Wean (preferred program)

A. At 2-6 weeks prior to weaning, administer:

- A vaccine containing chemically altered modified live IBR and PI3, MLV-BRSV, and inactivated BVD
- A new generation 7- way Clostridial vaccine
- Pasteurella hemolytica bacterin-toxoid or Pasteurella hemolytica - multocida combination
- No Salmonella vaccine should be given

B. Booster at weaning

- Re-vaccinate with MLV IBR-BVD-BRSV-PI3 or MLV IBR-BVD-PI3-KBRSV

Note: It is also acceptable to use any inactivated (killed) product pre-weaning if a MLV product is given at weaning and 2 to 3 weeks later (requires three vaccinations).

Option 2: Wean / Post Wean

A. At weaning, administer:

- MLV IBR-BVD-BRSV-PI3 vaccine, or MLV IBR-BVD-PI3-KBRSV
- A new generation 7- way Clostridial vaccine
- Pasteurella hemolytica bacterin-toxoid or Pasteurella hemolytica - multocida combination
- No Salmonella vaccine should be given

B. Booster at 14-21 days after weaning

- Re-vaccinate with MLV IBR-BVD-BRSV-PI3 or MLV IBR-BVD-PI3-KBRSV

Summary

Common events like branding, weaning, shipping, and feedlot entry are stressful to calves. Producers should take steps to minimize stress to calves prior to and during the weaning process, and before shipping to the feedyard. 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 preconditioning 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.

Literature Cited

Price, E. O., J. E. Harris, R. E. Borgwardt, M. L. Sween, and J. M. Connor. 2003. Fenceline contact of beef calves with their dams at weaning reduces the negative effects of separation on behavior and growth rate. *J. Anim. Sci.* 81:116-121.

NRC. 1996. *Nutrient Requirements of Beef Cattle* (7th Ed.). National Academy Press, Washington, DC.

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
-----% of observations-----					
Behavioral					
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
-----weight gain (lb)-----					
Performance					
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

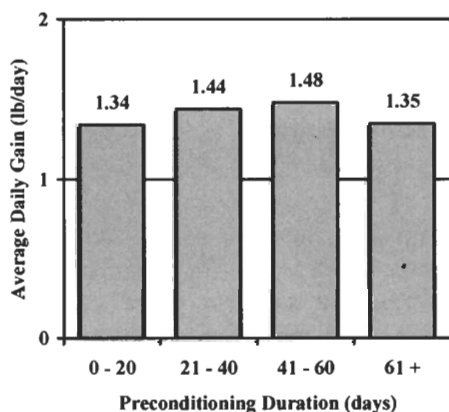


Figure 1. Impact of preconditioning duration (weaning to feedlot entry) on average daily gain of steers in the New Mexico Ranch to Rail program from 2001 to 2004.

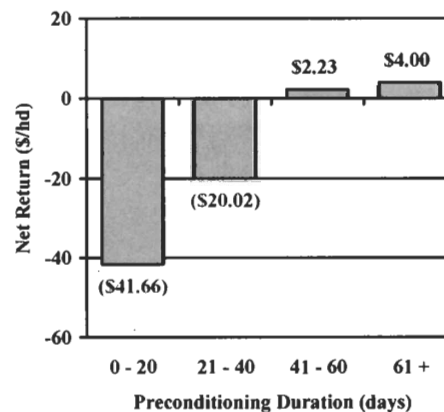


Figure 2. Impact of preconditioning duration (weaning to feedlot entry) on net return of steers in the New Mexico Ranch to Rail program from 2001 to 2004.