

Calf Vaccination Guidelines

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INTRODUCTION

Calf vaccination is an important component of a total herd health program. It will hopefully prepare a calf's immune response for the disease challenges that will occur as the calf moves into the seedstock or beef supply chain. An effective vaccination protocol can be developed to fit most operational and management approaches. This guide describes calf vaccination approaches that have been successfully implemented in cow-calf operations in New Mexico. However, producers should consult with their local veterinarian to design a vaccination program that fits their particular operation. It is important to understand that whenever a set of calves is processed (vaccinated), not all calves respond (are immunized) to the vaccines, and therefore vaccination does not always equal immunization. Some factors preventing immunization include processing stress; nutritional, vitamin, or mineral deficiencies; improper vaccine handling and/or administration; and others.

The foundation for each vaccination approach below is the administration of a 7- or 8-way clostridial vaccine at 2 to 4 months of age (brand-



ing), plus a modified-live virus (MLV) or chemically altered (CA) vaccine for the viral pathogens commonly associated with bovine respiratory disease (BRD) complex, given at the same time. The viruses included in most MLV- and CA-BRD vaccines are infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), parainfluenza-3 virus (PI3), and bovine respiratory syncytial virus (BRSV).

MLV and CA vaccines have been modified in such a way that they cannot cause disease as seen in natural infections, but are capable of replicating (reproducing viral particles) inside cells of the body. This replication triggers a response by the calf's immune system at the cellular level called cell-mediated immunity (CMI). Killed vaccines cannot replicate and therefore cannot prime the CMI response. The CMI response is the most effective way the body can neutralize a viral pathogen. Using MLV or CA vaccines at branding (2 to 4 months of age) "primes" the immune system, which produces initial immunity, triggers the CMI response, and induces the calf's ability to respond very quickly in the event of exposure to BRD viral pathogens. Because the calf's immune system is very young and easily influenced, this vaccination may be the most important of its life.

Vaccines received later in life benefit the calf greatly, but may not have the same influence as this initial "priming" of the immune response. However, additional "booster" vaccinations should be administered at or near weaning so the calf's maturing immune system becomes even better prepared to fend off actual disease challenges. Additional vaccinations required to help prevent respiratory disease caused by bacterial pathogens such as *Mannheimia/Pasteurella* will be needed, especially during the weaning period. The difference in the options described below is the timing of booster vaccinations at or near weaning and the product choices. Producers should consult with their veterinarian to determine which vaccine program to use at branding—MLV or CA. Their input will be valuable in developing your vaccination and deworming protocols. Deworming calves at weaning is beneficial and should be included in a weaning program.

The most effective protocol for developing immunity in calves is the priming vaccination at branding, followed by two booster vaccinations during a 45- to 60-day weaning period, preferably on the ranch. Research from New Mexico State University using data from over 800 calves from 48 sources showed that

separating weaning and feedlot entry by 41 days or more produced greater net return in the feedlot than when calves were shipped to the feedlot less than 40 days after weaning. Weaned calves perform better throughout the feeding process, and weaned, immunized calves perform the best.

If weaning on the ranch is not possible, then the priming vaccination at branding, followed by a pre-weaning booster at processing, would be the next best option. This way, when the calves are shipped "off the cow," they have received at least one booster vaccination. While receiving only one booster is not ideal, it will help prepare the calves for disease exposures to come.

The least effective protocol for developing immunity is when calves are "stripped and shipped" without a booster vaccination. The primer vaccination without a booster, while influencing the immune response, will likely not protect the majority of calves upon exposure to disease. If this is the only option, it is worthwhile to still prime the immune system at branding. It would be suggested to include the viral antigens along with a *Mannheimia/Pasteurella* vaccine component. This will provide an opportunity for the immune response to be enhanced by vaccines given further along the supply chain.

VACCINATION TIMELINE OPTIONS

Priming vaccination options

Branding (2–4 months of age)

- Clostridial 7-way (or 8-way if needed)
- MLV injectable: IBR, BVD, PI3, BRSV **OR**
- CA intranasal: IBR, PI3, BRSV (add injectable MLV-BVD) **OR**
- CA injectable: IBR, PI3, BRSV, BVD
- If calves are "stripped and shipped" straight off the cow (not weaned on the ranch, just sold off the cow without a booster), add a *Mannheimia/Pasteurella* vaccine at branding as well.

Booster #1 vaccination options

Pre-weaning (2–4 weeks prior to weaning)

- Booster with injectable MLV: IBR, BVD, PI3, BRSV
- *Mannheimia/Pasteurella*
- Booster clostridial vaccine (7- or 8-way): Can give clostridial vaccine, including *Histophilus somni*, but must give a booster of this vaccine in 3–4 weeks.
- Deworming

OR

Weaning: Let calves sit overnight before processing; this gives time for their cortisol levels to drop before vaccination, enabling a better immune response.

- Booster with injectable MLV: IBR, BVD, PI3, BRSV
- *Mannheimia/Pasteurella*
- Booster clostridial vaccine (7- or 8-way): Can give clostridial vaccine, including *H. somni*, but must give a booster of this vaccine in 3–4 weeks.
- Deworming

THEN

Booster #2 vaccination options (3–4 weeks after Booster #1 vaccination)

- Booster clostridial 7-way if including *H. somni* at the pre-weaning or weaning booster.
- Booster with injectable MLV: IBR, BVD, PI3, BRSV
- *Mannheimia/Pasteurella* booster (may be required by some marketing venues, depending on brand of vaccine)

Remember, consult with your regular veterinarian before making any changes to an established preventive healthcare program.

These are suggested guidelines to induce immunity in calves. Producers should be aware that many of the value-added calf marketing programs have more specific guidelines that must be followed for enrolled calves to be eligible to receive price premiums (for more information, see NMSU Extension Circular 637, *Preconditioning Beef Calves* [https://pubs.nmsu.edu/_circulars/CR637.pdf], and NMSU Extension Guide B-220, *Value Added Calf Programs for New Mexico Livestock Producers* [https://pubs.nmsu.edu/_b/B220.pdf]).

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