



Immunizing Beef Calves

A Preconditioning Immunization Concept

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Infectious diseases cause sickness and death in calves, before or after they are born. Unborn and nursing calves are at high risk to fatal diseases during the time of year when a beef rancher is calving cows, moving and mixing these cows, and bringing in bulls to them. Newborn calves can have low immunity and be highly susceptible to many diseases. They are exposed to germs shed by stressed cows, calves and bulls in the cow herd.

If sickness and death occur in weanling calves, the source of disease must be determined. Is the disease the result of dormant infections, now breaking out and shedding, in improperly immunized calves previously exposed in the herd? Is it the result of incubating infections in improperly immunized calves recently exposed in commingled, stressed and shedding calf groups? By properly vaccinating the entire herd, including pregnant cows, calves, replacement heifers and bulls, outbreaks caused by both dormant and incubating infections can be prevented.

This calf preconditioning immunization concept for beef herds provides protection against infectious diseases through passive and active acquired immunity for unborn, nursing and weanling calves. It involves giving immunizations before and after the calves are born. The immunizations for the vaccination schedules for a beef herd should be determined by a veterinar-



Preconditioned weanlings are destined to be stockers, feeders and replacements.

ian. This determination is based on how often infectious diseases occur in the beef herd, how widespread they become, and the risks of exposures to disease both inside and outside the herd.

Vaccinate Pregnant Cows, Replacement Heifers, Bulls

Unborn and nursing calves are protected against diseases by immunizing pregnant cows and pregnant replacement heifers during the last trimester of pregnancy. A cow herd that calves year around is vaccinated routinely every 6 months. Bulls and replacement heifers are vaccinated before introduction into the herd.

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These immunizations properly use noninfectious vaccines of various types: killed, subunit, inactivated toxins or intramuscular, temperature sensitive, modified live.

Table I: Cow Herd Vaccines

Pre-calving Vaccination of Cows and Heifers

(7 to 9 months of pregnancy or twice a year)

1. 4-way Viral BRD Vaccine
2. Pasteurella Bacterin & Leukotoxoid
3. Haemophilus Bacterin
4. 5-way Lepto Bacterin
5. 7-way or 8-way Blackleg Bacterin
6. Scour Vaccine
7. Vibrio Bacterin
8. Trich Vaccine

Prebreeding Vaccination of Replacement Heifers and Bulls

(3 to 6 weeks before breeding)

1. 4-way Viral BRD Vaccine
2. Pasteurella Bacterin & Leukotoxoid
3. Haemophilus Bacterin
4. 5-way Lepto Bacterin
5. 7-way or 8-way Blackleg Bacterin
6. Vibrio Bacterin
7. Trich Vaccine (Heifers)
8. Anaplas Vaccine

Stress at the time of calving reduces resistance to disease. Infectious microorganisms of bovine respiratory disease (BRD viruses and pasteurilla and haemophilus bacteria) can break out of dor-



Cows are vaccinated during the last trimester of pregnancy.

mancy and be shed. However, the active immunity provided by regular vaccinations is expected to suppress shedding of disease agents from the calving cows to the nursing calves of the current year's calf crop. The active immunity also provides protection for the following year's calf crop against abortion diseases.

Immunized cows provide passive immunity to calves through the colostrum (first milk). Calves are protected until 2 to 3 months of age against nursing calf diseases. Passive immunity is expected to minimize infection and shedding of disease agents and prevent development of sickness and death. Susceptible baby calves are those that do not receive an adequate amount of good-quality colostrum during the first 24 hours after birth.

A calf should receive an amount equivalent to 2.5 percent of its body weight in the first 6 hours after birth, and again over the next 18 hours. An 80-pound calf needs 2 quarts of colostrum from an immunized cow during the first 24 hours of life to receive protective immunity.

Vaccinate Nursing Calves

Nursing calves are vaccinated at 2 to 3 months of age against calf diseases. The immunizations are noninfectious vaccines and are repeated 2 to 4 weeks later. The first vaccination is a priming,

Table 2: Calf Herd Vaccines

Post-calving Vaccination of Nursing Calves

(2 to 3 months of age)

1. 4-way Viral BRD
2. Pasteurella Bacterin & Leukotoxoid
3. Haemophilus Bacterin
4. 5-way Lepto Bacterin
5. 7-way or 8-way Blackleg Bacterin

Preweaning Vaccination of Nursing Calves

(3 weeks before weaning)

1. 4-way Viral BRD Vaccine
2. Pasteurella Bacterin & Leukotoxoid
3. Haemophilus Bacterin
4. 5-way Lepto Bacterin
5. 7-way or 8-way Blackleg Bacterin
6. Bang's Vaccine (Heifers)

sensitizing dose that provides no protection or a low protection for 1 to 4 months. The second vaccination is a required booster dose, recommended within 2 to 4 weeks, but acceptable within 4 months. It should precede weaning by at least 3 weeks. Duration of the immunity following the second dose is 6 to 12 months.

Immunizations precondition calves by providing immunity to nursing and weaning calves destined to be stockers, feeders and replacements. Heifer calves selected for replacements are immunized against venereal diseases at the time of boosters within 3 to 6 weeks before breeding.

The active immunity developed by the nursing calves is expected to minimize infection and shedding and prevent sickness and death from disease caused by exposures before and after weaning. Immunity might suppress shedding of BRD viruses and pasteurella and haemophilus bacteria at times of stress during hot or cold weather, weaning, selling and hauling. Dormant infections in calves not immunized with two vaccinations prior to weaning commonly break out and cause shedding, sickness and death in calves with weakened immunity at weaning.



Nursing calves receive a priming vaccination at 2 to 3 months of age.

If the required booster vaccines are not given before weaning, they must be given at 3 weeks after weaning. Because the first dose is noninfectious, the second dose in weaning calves also is a noninfectious vaccine. An infectious vaccine (modified live) usually is ineffective following a

noninfectious vaccine because it prevents the desired infection of the modified live vaccine from being established.

Nursing calves in a cow herd with low risk to bovine virus diarrhea (BVD) and bovine respiratory syncytial virus (BRSV) are not given the priming and booster four-way viral BRD vaccinations. An infectious bovine rhinotracheitis/parainfluenza-3 (IBR/PI₃) infectious vaccine (intranasal, temperature sensitive, modified live) is administered as a nasal spray at 2 to 3 months of age. At weaning, an infectious IBR, PI₃, BVD, BRSV vaccine is administered intramuscularly. The four-way viral BRD vaccine does not contain intramuscular, temperature sensitive, modified live IBR virus. Immunity induced by the infectious four-way viral BRD vaccine will last a lifetime in properly vaccinated weaning calves. When the desired infections of the BRD viruses are established, repeated modified live infectious vaccinations become unnecessary.



Nursing calves receive a booster vaccination at least 3 weeks prior to weaning.

Background Weaning Calves

Weaning is traumatic to a calf and one of the greatest stresses it undergoes. Other stressful procedures should precede or follow weaning by at least 3 weeks. It is best to perform castration and dehorning at birth or before the calf reaches 3 months of age.

Nursing and weanling calves are dewormed for stomach worms in the spring, summer and fall. In the spring and fall, deworming occurs as larvae develop following recent optimum transmission time. In the summer, deworming occurs during larval inhibition that follows optimum transmission in June.

Before selling or shipping, weanling calves are *backgrounded* for a minimum of 3 weeks. They are kept on grass or fed hay and concentrates, given supplements to provide nutrition, and are kept separated from other groups to prevent suppression of immunity, reduce stress and prevent

commingling. Calf groups, whether from inside the herd or outside, are not commingled. During backgrounding, activities are kept to a minimum. No noninfectious vaccinations, castrations, dehorning, selling or hauling are performed.

Additional Reading

Additional information can be found in the following Texas Agricultural Extension Service publications: *Cattle Vaccines*, L-5289, and *Common Cattle Parasites*, L-2333.

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Extension publications can be found on the Web at: <http://agpublications.tamu.edu>

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