

Beef And Dairy Cattle Vaccination Programs

Infectious diseases threaten profitable beef and dairy production. Vaccination is an important component of control and prevention of these diseases. A vaccination program, however, is not a substitute for good nutrition, adequate ventilation, effective sanitation, and other health management procedures.

Vaccination programs should be developed in cooperation with the herd veterinarian. Individual herd circumstances, including disease history, management, housing, feeding practices, breeding, and other factors, affect the specific vaccination programs in any beef or dairy operation. Type of vaccine, such as killed or modified live, timing, costs and benefits, and other factors must be considered. Rigid recipes that fit all production units are impractical and even dangerous if not instituted in individual herds with professional care. Improper use of vaccine can lead to vaccine failure or possibly even more dire consequences.

Vaccines help prevent infectious diseases, but few provide 100 percent immunity for all animals in a herd. Most vaccines raise the general level of herd immunity so that the threat of spread of an infectious disease is minimal.

General Considerations When Designing a Vaccination Program

Antiserums are made from the blood of animals that are immune to a given disease. They contain antibodies against that disease and

afford immediate protection. They are of relatively short duration, usually providing protection for only two or three weeks. Antiserum is given in fairly large volumes, is usually expensive, and is not available for many infectious diseases. It is usually used in the face of a disease outbreak such as enterotoxemia in nursing calves.

Some vaccines are produced by modifying the infectious agent in such a way that the organisms remain alive, multiply, and produce immunity in the vaccinated animal, but does not produce disease. Many modified live vaccines cannot be given to pregnant cattle because they will invade the fetus and cause birth defects or abortion. Examples are injectable modified live infectious bovine rhino-tracheitis and bovine virus diarrhea vaccines. Modified live vaccines generally produce a higher level of immunity than killed vaccines, but may have a degree of risk when given to either pregnant or highly stressed cattle.

Vaccines are often ineffective when given to young calves. Their immature immune systems may not be able to respond to the vaccine or antigen. Antibodies acquired from the dam through colostrum that protect the calf from many infectious diseases also may block and destroy the antigens in the vaccine. This phenomena is referred to as maternal antibody interference and is a major reason for not vaccinating very young calves against several infectious diseases.

Vaccination Programs for Beef Cow/Calf Herds Small Calves

Oral rotavirus and coronavirus vaccine

These two viral causes of calf scours are given orally in a combination vaccine. They should be given prior to ingestion of colostrum if possible. Many clinicians prefer to use injectable rotavirus/coronavirus/*E. coli* in the dam prior to calving and depend on colostrum antibodies to protect calves.

Vaccination of calves for infectious bovine rhino-tracheitis (IBR), bovine virus diarrhea (BVD), parainfluenza-3 (PI-3), and bovine respiratory syncytial virus (BRSV) is usually delayed until several months of age because of the problem of maternal antibody interference. Veterinarians occasionally advise vaccination in the face of outbreaks or in selected herds with a history of these diseases in young calves, but this is not a normal recommendation by most practitioners. Vaccination of young calves with nasal IBR/PI-3 vaccine avoids many of the problems of maternal antibody interference.

Pastured Beef Calves

Clostridia

Calves are usually vaccinated for the major Clostridial diseases prior to turnout to pasture. The Clostridial diseases include:

- Clostridium chauvoei*—Blackleg
- Clostridium septicum*—Malignant edema
- Clostridium perfringens*—Enterotoxemia (types B, C, and D)
- Clostridium sordellii*—Sudden death
- Clostridium novyi*—Sudden death
- Clostridium haemolytica*—Redwater

Redwater occurs in limited endemic areas and is uncommon in the Midwest.

Pinkeye

In some herds, pinkeye is a continuous problem. In these herds, pinkeye vaccine is usually given prior to maximum risk of disease.

Beef cattle pre-weaning vaccinations and health procedures (Preconditioning)

Producers who intend to retain ownership of their calves should vaccinate 14 to 21 days prior to weaning. Stress is spread out over time and an immunity is developed to several respiratory and other diseases prior to weaning, when risk is highest. This program also should be performed on all replacement heifers that are to be kept in the herd.

- IBR (infectious bovine rhino-tracheitis)
- BVD (bovine virus diarrhea)
- PI-3 (parainfluenza-3)
- BRSV (bovine respiratory syncytial virus)
- 7-way Clostridia vaccine
- *Haemophilus somnus*
- Worm
- Castrate and dehorn if not done previously
- Leptospirosis (5 strain) for replacement heifers
- Pasteurella vaccination is optional

Pregnancy testing (beef cows and heifers)

Worm and booster vaccinate cows and heifers for:

- IBR, PI-3, BVD, BRSV (Need is risk-based. Consult with herd veterinarian.)
- Leptospirosis; vaccinate if not done prior to breeding

Pre-breeding (beef cows and heifers)

- Booster vaccinate for previously mentioned virus diseases (if not done when palpated for pregnancy in the fall)
- Booster vaccinate for leptospirosis (5 strain)

Pre-breeding vaccination for leptospirosis is usually preferable to fall vaccination in most herds. Producers who only handle the breeding herd once per year should perform the vaccinations in the fall when cows are pregnancy tested.

The pre-breeding vaccinations should be done approximately five weeks prior to breeding to avoid any possible vaccine induced stress or complications that could affect fertility.

Pre-calving

Rotavirus, coronavirus, and *E. coli*—This vaccine should be given to replacement heifers twice, approximately six and three weeks prior to calving. Vaccinate cows once, three weeks prior to calving, or twice according to the same schedule as first-calf heifers in herds not previously vaccinated or in problem herds.

Bulls

IBR, BVD, PI-3, BRSV, and leptospirosis vaccines annually.

Vaccination Programs for Dairy Herds Heifers

Three to four months of age

- Clostridial group vaccine at three to four months of age, or earlier depending on risk.

Five to six months of age

- IBR, BVD, PI-3, BRSV
- Haemophilus
- Clostridial group
- Leptospirosis (5 strain)
- Worm
- Grub and lice treatment in early fall, repeat as needed

Pre-breeding

- IBR, BVD, PI-3, BRSV
- Leptospirosis (5 strain)

Pre-calving

- Rotavirus, Coronavirus, *E. coli* twice, at six and three weeks prior to calving.

Adult Cows

Cows are generally vaccinated for leptospirosis and the virus diseases during the early lactation period, approximately five weeks prior to breeding. Some veterinarians prefer to vaccinate during the dry period, although modified live virus vaccines are not used at this time.

Vaccinating Feedlot Cattle

Replacement feeder cattle should be vaccinated within 24 hours of arrival in the feedlot. There are only very rare exceptions to this guideline. Selection of killed vs. modified live vaccines should be based on condition of the cattle on arrival. Vaccination with killed virus vaccines should be repeated in two to three weeks.

Vaccinations on arrival

- IBR, PI-3, BVD, BRSV
- 7-Way Clostridia
- *Haemophilus somnus*
- Pasteurella vaccination optional

Cattle should be implanted with a growth promotant and wormed upon arrival at the feedlot. Depending on time of year, they also should be treated for grubs and lice within 21 days of arrival.

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