

## BEEF HEALTH

# Pre-weaning Vaccinations

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As we near the end of the summer months, we all should start thinking about the next steps in the cow production cycle: pregnancy diagnosis and weaning.

Weaning is the most stressful time in a calf's life, because calves will often experience several significant changes at one time. Some of these changes include dietary changes (milk/pasture to hay/concentrate), weather changes (warm/dry to cold/wet), and social changes (pasture to no more mom/dry lot). The ideal situation would be to make only one change at a time, however, this is sometimes not feasible.

A few possible solutions would be to start making changes on the pasture. Depending on the production system, creep feeding the calves might reduce the stress of dietary changes. Ideally, if possible, the calves could be left on the pasture, and the cows kept in the dry lot, or on a separate pasture. Weaning earlier in the year, before the weather turns cold and wet, is a good way to get around environmental stress. Also, the uses of some types of anti-nursing devices have been able to significantly reduce the stress of weaning. These are some options to consider, each producer should evaluate his/her production system to determine what specific stress-relieving changes can be made. Consult with your herd veterinarian on weaning strategies, as well as vaccination recommendations.

## STRESS

Why is stress is the most important challenge to overcome when weaning calves? Stress causes the release of the hormone, cortisol, from the adrenal gland. Cortisol is a "catabolic steroid" that has negative effects on the immune system. This immunosuppression not only makes a calf more susceptible to respiratory disease, but it also decreases the calf's ability to respond to a vaccine. So, even though you may have given the calf a shot, the calf may not be protected because its immune system was unable to respond to the vaccine. Because of this, it is important to get the first dose of vaccine into the calves while they are still nursing, when stress levels are low.

## BUGS TO BEAT

### Respiratory pathogens:

**Viruses:** IBR, BVDV, PI 3, BRSV

All calves should receive a vaccine against these viruses. Alone, these viruses will cause significant disease. However, they rarely act alone. The viruses compromise the calf's mechanical defenses in the trachea and lungs, which allows the bacteria to overgrow. This results in a bacterial pneumonia that can leave the calf with permanent damage to lung tissue, and decrease the calf's ability to grow. This will result in poor performance in replacement heifers and bulls and poor growth and carcass performance in steers.

**Bacteria:** *Pasteurella sp.*, *Manhemmia sp.*, *Histophilus sp.* (formerly *Hemophilus*)

Vaccination against the bacterial respiratory pathogens is usually only necessary in cattle that are destined to go into a feedlot. These vaccines vary in efficacy and often their utility depends on the situation. If you have a problem, or anticipate having a problem with one of these bacteria at weaning, it may be prudent for you to consider using a vaccine containing a respiratory bacterial component. Some retained ownership programs (i.e. U of M Carcass Merit Program) and custom feeders may require that calves be vaccinated against these bacterial pathogens before they are received into the feedlot.

### **Clostridia**

(tetanus, blackleg, botulism, overeating disease, redwater, etc.)

Most vaccines against clostridial organisms are very efficacious and usually one dose will impart life-long immunity. If, however, you live in an area or region that has significant problems with a clostridial organism, it may be prudent for you to vaccinate more often than once a lifetime. Most of us can get away with one dose, with administration of a booster in high risk situations (i.e. bull calves castrated using a band/banding device should receive a tetanus vaccination at the time of castration).

### **Leptospira**

If you are retaining replacement heifers, or selling breeding stock, it would be wise to vaccinate against *leptospira*. The lepto component of a lot of the combination vaccines usually is not very efficacious, and does not provide complete protection. However, vaccinating against lepto is better than doing nothing. If you have tested your herd, and found that you have a problem with *Leptospira hardjo subsp. bovis*, you may want to consider using the Spirovac vaccine. It is a fairly expensive vaccine, and therefore should be used in cases of known infection.

## **VACCINE INTERACTIONS**

An interesting finding (recently published in BEEF magazine) indicated that there is an interaction between the IBR portion of a modified live vaccine and the *Manhemmia* fraction of a vaccine. If a calf has never been vaccinated before, and the two are given to a calf at the same time, the calf will not develop an effective immunity against *Manhemmia*. Therefore, a calf that you thought was protected against this bacterium actually isn't.

In order to get around this issue, the *Manhemmia* vaccine should be given at least 2 weeks after the modified live IBR vaccine. This ensures that the calf's immune system has responded to the IBR and is ready to take on the *Manhemmia* vaccine.

Products/product handling

### **Modified live vs killed vaccines:**

It is my opinion that there is no reason why a modified live vaccine should not be used on nursing calves. Some producers are concerned about causing abortions in the cows if the nursing calves are vaccinated with a modified live vaccine, but the risk for such an event is miniscule. Modified live vaccines will provide better protection against the viral respiratory pathogens because they will stimulate two different populations of immune cells (CD4 + and CD8 + T cells), whereas a killed vaccine will only stimulate one of these populations (CD4 + t cells). Also, in regard to killed vaccines, research indicates that there is strong interference with the vaccine by maternal antibodies from the cow's colostrum, and maternal antibodies can hang around in the calf's circulation for up to 6 months. Therefore, you are not likely to gain a good response from a killed vaccine until after the calf is of weaning age.

Proper handling of vaccine is important for the maintenance of its efficacy. Expiration



dates should be checked before use, and vaccine should never be allowed to reach room temperature before use. It is also a good practice to keep the vaccine out of direct sunlight. Ultraviolet rays will likely kill a large number of viruses in a modified live vaccine. By covering, or providing shade for multidose syringes when not in use, you will be able to minimize UV damage to the vaccine before you get it into the calf. Because there are actually living viruses in the vaccine, the efficacy of the vaccine is dependant on the survival of those viruses.