

Randall J Berrier, DVM  
Staff Veterinarian  
Technical Service

## Anaphylaxis in Cattle

In the late winter and early spring of the year, cattle ranchers begin to band or castrate, brand, dehorn and vaccinate for a variety of different diseases. Cattle are injected with many different substances - antibiotics, vaccines, bacterins and toxoids to name a few. All of these substances are observed as "foreign" by the animal's immune system, and this is what we hope to achieve through vaccination. The animal's immune system will develop antibodies and/or cell-mediated immunity to combat these foreign agents in the future when they may be encountered through natural exposure. The vaccine generates an immune response without creating illness.

On very rare occasions cattle can develop an acute allergic reaction to a foreign substance that has been injected into its body. These reactions can range in severity from hives and itching to systemic shock with pulmonary edema (fluid in the lungs) and death. This most severe reaction is called anaphylactic shock. Again, this syndrome is rare. It has been estimated to occur in less than one animal per 10,000 in cattle. However, cattle do seem to be the most susceptible among our domesticated species.

It is not uncommon to see a group of calves develop anaphylaxis when it does occur. This can happen in calves just a few weeks old. This is because these calves have been raised together and exposed to the same environmental sensitizing antigens. These sensitizing antigens are proteins and can be bacteria, viruses, molds, fungi, antibiotics or components in the antibiotics or other injectables or maybe something in their feed. There also may be a genetic link in some breeds of cattle making them more susceptible to anaphylaxis. When first exposed to these sensitizing proteins, the animal's immune system will develop antibodies over a certain amount of time (days to weeks). When the animal is exposed again, through vaccination, to the same antigen it was sensitized to, the allergic reaction occurs. When an entire group of calves react it is only because they have all had the same sensitizing exposure and the same period of time for sensitivity to develop and the same type of shocking dose (i.e. vaccination).

Anaphylaxis usually happens within 10 to 20 minutes from the time of the injection. It can take up to two hours for anaphylaxis to show up. Many animals do survive anaphylaxis, but in severe cases animals can die very quickly. The target organ in cattle is the lung. The first symptoms noticed are increased respiration rate and muscle fasciculation's (tremors). As conditions worsen, the animal's lungs fill with fluid and they will breath with their mouth open and their tongue extended out. They often times will walk backwards, trying to take deeper breaths. In advanced stages you can hear moaning and bloody foam will come out of their mouth and nose, followed by collapse and death.

It is very important to treat these animals when symptoms first appear. Epinephrine (1/100) subcutaneously at a dose of 1cc per 100 lb. of body weight is the drug of choice and can literally be a lifesaver. A second dose can be given in 15 - 20 minutes if needed. In addition Flunixin Meglumine (50 mg/ml) can be given at a rate of 1 to 2 cc per 100lb. intravenously or intramuscular as well. Consult with your veterinarian about the use of these drugs. It is a good idea to have these drugs on hand when vaccinating cattle and to keep cattle confined and observed for a while after vaccinating for signs of anaphylaxis.

This article is certainly not intended to discourage the use of the many excellent products available for preventing and treating various livestock diseases. The valuable efficacy of today's vaccines, toxoids, bacterins, antibiotics and serum products far outweigh the risk of anaphylactic shock. When one is aware of what might occur and knows what measures to take to counteract it, then there is certainly no reason to be overly concerned.

Also, in spite of the normal inclination to blame a drug or vaccine for a reaction, one should keep in mind that a product's manufacturer has no control over this phenomenon and that it does not spring from any manufacturing defect in the products themselves.

Reference: Farm Supplier, March 1982, Animal Health, page 51 by J. Calvin Downing, DVM,

