

The Veterinary Link

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Using vaccination to reduce disease risk

Use of appropriate vaccines in cattle herds is an important component of disease control; for some diseases it is nearly as important as proper nutrition

and sanitation. Just as in human health, vaccines can play an important role in preventing some cattle diseases, but not others. And, for some diseases, vaccines

play a supporting role compared to more important disease-control tools such as adequate nutrition, good sanitation and diagnostic testing.

Follow directions

The first vaccine was invented more than 200 years ago to protect people from smallpox. The concept is to expose an animal to a dose of a disease-causing germ that is small enough to avoid causing illness but that will stimulate the immune system to begin building protective agents. Because of this early, limited exposure, if the animal is exposed to dangerous doses of the germ in the future, the body is already prepared and can act more quickly to neutralize or remove the disease-causing invaders.

For some diseases, this strategy works very well; but in other cases, the disease-causing germs “hide” important parts of themselves to avoid detection by the immune system or only allow a weak response. In other situations, a disease-causing germ can multiply so rapidly that the animal’s immune response is not large enough or fast enough to prevent disease.

In other situations, a vaccine that is likely to provide protection if administered to healthy cattle will fail to stimulate the building of a protective response if the animal is facing some limitation. In general, very young calves do not respond with a strong immune response to injected vaccines. In addition, cattle that are stressed, malnourished or suffering from disease are not likely to respond to a vaccination by building a protective immune response.

In order for vaccines to work well, it is important that the directions on the label be closely followed. Vaccines, particularly modified-live-virus (MLV) vaccines, are susceptible to damage from sunlight, heat or mishandling. It doesn’t take very long in sunlight or excessive heat for vaccines to lose their ability to produce a protective response in cattle.

Vaccines should be given according to the dose and route of administration indicated on the label, and they should not be mixed with other products unless specifically indicated on the label. Many labels require vaccines to be given under the skin (subcutaneous, or sub-Q), while others are labeled to be given in the muscle (intramuscular, or IM), and some vaccines are squirted into the nose (intranasal).

Locations for vaccine injections should follow Beef Quality Assurance (BQA) guidelines and should be confined to the neck region.

Timing is everything

The ideal time to vaccinate cattle is when they are receiving adequate nutrition and they are free from stress or disease. While veterinarians and cattlemen often find it necessary to vaccinate stocker or feedlot calves at less-than-ideal times, such as immediately after being transported a long distance, timing of cow herd

vaccinations can often be planned to avoid periods of stress. If at all possible, cow herd vaccination should be avoided during extreme weather and rescheduled when the time, effort and expense of vaccination are more likely to be worthwhile.

The selection of which vaccines to use in a particular cow herd depends on the risk of exposure the herd faces to specific disease-causing germs, the likely success of the vaccine to reduce losses if exposure occurs, and the likelihood of negative responses to the vaccine. You should work closely with your veterinarian to develop a vaccination plan that results in the best compromise between the positive and negative attributes of disease vaccination likely to be encountered in your herd.

Vaccines to reduce losses due to clostridial diseases such as blackleg and vaccines against some of the viruses and bacteria that contribute to respiratory disease (pneumonia) are commonly given to young calves prior to or at weaning. In addition, replacement heifers and bulls, as well as adult cows and bulls, are routinely vaccinated to reduce the risk of some abortion-causing infections.

Some types of vaccine will not provide a protective response after the first dose and require a second dose in order to be beneficial. Other vaccines may only require a single dose to be effective, but more than one dose is often advised in order to be more certain of successfully causing an immune reaction in a majority of the herd.

Some vaccines provide several years of protection, while others need to be boosted more frequently. This is in large part controlled by the ability of a vaccine to produce a long-term "memory" of the disease-causing germ. This ability is related both to the type of vaccine used and the type of germ vaccinated against. And while in the ideal situation, vaccine timing would be planned to maximize the effectiveness of the vaccine, other factors such as convenience of handling the cattle have to be considered when planning the vaccination strategy.

Sound management

Protection from a number of important beef cattle diseases has been enhanced by the development and improvement of vaccines. In order to obtain benefit from these vaccines, their use must follow sound veterinary principles, and they must be combined with other management practices that control risk.

Because of the limited number of diseases for which vaccines are available and the inability of vaccines to provide immunity in the presence of nutritional deficiencies, immunosuppression and other management problems, vaccination programs should not be the cornerstone for a herd health program but, rather, a part of a sound management program.

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