



Vet Call

► by **Bob Larson**, professor of production medicine, Kansas State University

Vaccine storage and handling

Producers and veterinarians routinely utilize vaccinations to help prevent and control disease in cattle herds. Using vaccines is one of the most familiar and important strategies to limit illness, abortions and death loss in cattle that are exposed to disease-causing viruses, bacteria and other agents.

Important role

Cattle have elaborate methods to respond to disease-causing agents that enter their bodies that, if effective, will limit or eliminate the agents before a pregnancy is lost or the animal is killed. Vaccinations act to prepare these responses with a small exposure to the agents so that the cattle can react more quickly and effectively if they are later exposed to disease challenges than they would if a natural exposure were their first contact with the disease-causing agent.

The natural immune response to disease challenges is very complex and highly regulated within the body.

The difficulty producers and veterinarians face when using vaccines to control disease is the need to cause a disease-agent introduction that is similar enough to a real disease situation so that the animal's immune system is stimulated appropriately — without causing harm in the process.

When using vaccines in cattle herds, two important problems can occur. The first is using a vaccine that does not result in protection against exposure to an important disease-causing virus, bacteria or other agent. The second is using a vaccine that causes a severe negative reaction at the site of vaccination or throughout the body. Both of these problems can be caused by improper storage and handling of the vaccine anytime between its manufacture and its injection into an animal.

Handle with care

Vaccines are sensitive to temperature and sunlight. Both hot and cold temperatures can quickly cause enough harm to a vaccine to make it unable to provide protection. Sunlight can also cause very rapid loss of effective protection. Although modified-live

virus (MLV) vaccines are considered to be more sensitive to heat, cold and sunlight than killed vaccines, all vaccines should be handled in ways to minimize temperature extremes and exposure to sunlight.

Producers and veterinarians have essentially no control over the manufacture, storage and shipment of vaccines prior to arrival at the veterinary clinic or ranch, so it is important to deal with reputable companies that have strict quality control procedures

in place and that will stand behind their products. If you receive vaccines on a hot day and the shipping box does not have a cold ice pack, you should not accept the vaccines. Similarly, if you receive vaccines that have been frozen (arrive at very low temperatures), they

should not be accepted.

Once you receive the vaccines you plan to use in your herd, you should refrigerate them until they are placed into an insulated cooler for transport to the working chute. Read and follow all instructions on the label, and do not mix vaccines in the same bottle or syringe that were not intended to be mixed together. Do not remove more than the number of doses you will use in less than 30 minutes to an hour from the cooler.

Because cleaning and disinfecting detergents can easily destroy the ability of vaccines to work effectively, if these types of products are used to clean reusable syringes, they must be thoroughly rinsed in boiling water before being used. Needles should not be cleaned and reused; instead, use disposable needles. Always clean syringes between uses; it is important to not use a syringe for one product followed by another product without thorough cleaning in between.

Previously used needles should never be used to withdraw vaccine from the bottle.

This should only be done with a brand new needle to prevent contaminating the contents of the bottle. For rehydrating the freeze-dried portion of an MLV vaccine with the provided liquid, ideally, a double-sided transfer needle should be used. If a transfer needle is not available, you should use a new needle and syringe.

Another caution

Not only is it important to handle vaccines appropriately in order to ensure that they will provide the protection that you expect, the second concern when using vaccines is the risk of endotoxic or anaphylactic reactions to a vaccine (see "Vet Call," July 2005). Even though endotoxins only originate in certain types of bacteria (gram-negative bacteria), it is possible for any type of vaccine to become contaminated with endotoxin from gram-negative sources during the manufacturing process. Vaccines should be handled carefully. Heat, freezing and vigorous shaking can disrupt bacterial cells in gram-negative vaccines and release additional endotoxin.

Because all products cause at least some tissue damage, in order to meet Beef Quality Assurance (BQA) guidelines, all vaccines labeled for subcutaneous (Sub-Q) injection should be administered under the skin in the neck region. If a vaccine label requires that the product be given in the muscle [intramuscularly (IM)]; it should only be injected in the neck muscles. Vaccines that are squirted into the nose clearly meet BQA guidelines.

Proper use of vaccines is an important tool to prevent and control costly diseases in cattle herds. In order to gain the full benefit of a vaccination program, the products chosen should be handled carefully from the time of manufacture until they are injected into your cattle.

E-MAIL: rlarson@vet.ksu.edu