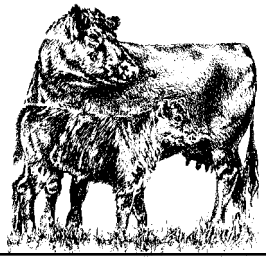

Western Beef Resource Committee *Fourth Edition*

Cattle Producer's Handbook

Animal Health Section 614

Handling Vaccines

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University studies in Arkansas, Nevada, and Idaho have indicated that veterinary vaccine product efficacy is at risk due to improper handling and storage. Most animal vaccines require maintenance at refrigeration temperatures of 35°F to 45°F. These studies have shown that refrigerators often fail to maintain consistent temperatures adequate for vaccine storage. The studies identified a lack of awareness and the need for training producers, distributors, and retailers when transporting, handling, and storing vaccines.

University of Arkansas research found that cattle producers are careful to store animal health products under refrigerated conditions (Troxel and Barham 2009). However, this research found a large variation in proper setting, maintenance, and function of refrigerators. In fact, 76 percent of tested refrigerators in this study were deemed unacceptable for storing animal health products.

Similar research at the University of Nevada found 25 percent of tested refrigerators failed to maintain proper storage temperatures and 80 percent of those actually froze the vaccine (Torell 2006). Monitoring and management of refrigerators and animal health products were the major recommendations from these studies.

University of Idaho research conducted in 2010 found that 67 percent of tested producer refrigerators and 66 percent of tested retailer refrigerators were unacceptable for storing vaccines (Fife et al. 2012). Temperature adjustment, monitoring, and improved record-keeping practices were some of the recommendations for producers. Monitoring and improved employee training at the retail level were also suggested.

Vaccines in Brief

Infectious disease in beef cattle can cause a significant loss of production and profit to producers. One way to reduce these losses is to increase the animal's ability to fight disease through good vaccination practices. Vaccines stimulate the body's immune system to build immunity or resistance against disease-causing organisms.

Most vaccines are manufactured by growing a particular organism that is later weakened or killed. When a vaccine is introduced to the body, the immune system must first recognize it as a foreign antigen or protein, such as a virus, bacteria, toxin, or parasite. An immune response is then produced to fight the antigen by developing specific antibodies and immune cells to remove or kill the infectious agent. Memory cells are then developed for each antigen.

When the body is later re-exposed to the same antigen, memory cells will recognize the infectious agent and remember the most effective way to protect the body. With any inoculation, it generally takes 7 to 14 days for the body to develop immunity to an antigen on primary exposure and as little as 48 hours to respond in a vaccinated animal.

It is important to understand that some animals' immune systems fail to develop an immune response sufficient to create immunity to a disease. Factors contributing to this failure are inadequate nutrition, poor health, stress, and environmental conditions. Healthy animals on a sound nutrition program should develop the best immune response. *However, remember that vaccinating your animals is not a 100 percent guarantee all vaccinated animals will gain immunity to that particular pathogen. The degree of protection is dependent upon animal health and vaccine efficacy at the time of administration.*

Two common types of vaccine are killed and modified-live. Killed vaccines are made by growing an organism in a growth medium. The organism is then inactivated or killed utilizing chemicals or heat. A killed vaccine can be produced for viruses, bacteria, or toxins. Adjuvants, which are specific chemical materials that help stimulate immunity and hold the organism at the injection site to strengthen the immune response, are regularly added to killed or inactivated vaccines.

Killed vaccines often require two separate inoculations over 2 to 4 weeks to obtain a full immune response. Therefore, it is important to administer both inoculations of a killed vaccine. An example of a killed vaccine is Triangle 5® by Boehringer Ingelheim. Triangle 5® protects against infectious bovine rhinotracheitis (IBR), bovine virus diarrhea (BVD types 1 and 2), parainfluenza 3 (PI_3), and bovine respiratory syncytial (BRSV) viruses. These vaccines are already constituted and ready to use when purchased.