

VACCINE HANDLING

Producer Tips for Chuteside Success



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Vaccines are an integral part of a comprehensive herd health program. When used in conjunction with other management tools, vaccines can reduce both the risk and impact of disease in beef cattle herds. Nevertheless, when used inappropriately, vaccines can be virtually useless and, in some cases, result in impaired productivity and significant economic losses.

Types of Vaccines

Veterinarians and cattle producers generally have two types of vaccines to choose from: killed or modified live (MLV). Killed vaccines are produced by chemical inactivation of a specific pathogen or by the isolation and chemical deactivation of a specific toxin. MLV vaccines are produced using pathogens that have been weakened in some way. The methods used to weaken the pathogen can vary but usually include growth in unusual conditions or genetic manipulations with the overall goal being to produce a vaccine that will in some way mimic natural infection when given to the animal without causing severe disease.

Advantages and Disadvantages of Killed and MLV Vaccines

While no type of vaccine is right for every situation, there are advantages and disadvantages of each vaccine type that may influence your choice of product. It is essential that you work with your veterinarian to choose a product and develop a protocol that best fits the needs of your operation.

Killed vaccines are generally more stable during storage and can be more forgiving of errors in handling. In addition, killed vaccines are less likely to cause disease by reverting back to a more virulent form and may be more appropriate for immunosuppressed animals. However, killed vaccines contain adjuvants (additives to improve the immune response) that often cause mild to moderate, but temporary, depressed performance. Also, some killed vaccines may contain gram-negative bacterial endotoxin that may cause negative health effects, especially if the vaccine is mishandled.

MLV vaccines typically require fewer doses than killed vaccines, are relatively less expensive, and stimulate an immune response that is more similar to natural infection. Nevertheless, MLV vaccines carry a



higher risk of vaccine-induced disease due to reversion to a more pathogenic form and may not be appropriate for immunosuppressed animals. A more detailed list of the characteristics of each vaccine type can be found in Table 1.

Table 1. Characteristics of Killed and MLV Vaccines

Killed	MLV
Stable during storage	Fewer doses required
Less likely to cause disease	Less risk of allergic reactions
Easier to store	Relatively inexpensive
Safer for immunosuppressed animals	Smaller dose required
Elicits strong antibody responses	Mimics natural infection

Handling of Vaccines

Regardless of type, vaccines contain viruses, bacteria, or toxins made up of a specific structure. Should these specific structures change, the effectiveness of the vaccine can be greatly reduced, and the risk of adverse events increased. Storage of vaccine at temperatures above or below what is recommended on the label, or exposure to excessive amounts of UV light, can damage the structural components of a vaccine that are essential for optimum responses. In addition, cleaning syringes with detergents, soaps, or disinfectants can have the same effect.

Therefore, successful vaccination is more than just injection of a product into a cow, calf, or bull. To achieve an optimum immune response with a specific vaccine several practices must be followed. The following section will detail some of those practices and assist in making your vaccination program more effective.

Guidelines for Successful Vaccination

Select the best product

Purchase your vaccines from a reputable dealer. Regardless of type (killed or MLV), vaccines should be refrigerated. If unrefrigerated for any extended period of time, a vaccine can lose almost all effectiveness and not provide the protection against disease that you are looking for. Dealers that monitor the temperature of their products during shipment and during storage should receive preference.

Protect vaccine from light, keep it cool during use

Following purchase, the vaccine should be transported in a sealed, refrigerated container that contains some type of cool pack. Vaccines should be refrigerated and kept out of light during storage. Never freeze a vaccine to prolong shelf life. It is absolutely essential that you measure the temperature inside your refrigerator to ensure large changes in temperature do not occur during storage.

Handle vaccine properly chuteside

Always keep the vaccine and syringes used to give the vaccine refrigerated or cooled when handling cattle. Do not leave syringes exposed to direct sunlight on top of working tables or tailgates while in

use. All unused and unmixed product should remain refrigerated and only be mixed immediately prior to use. Mix only enough vaccine to be used in a 30-minute period.

Handle syringes and needles appropriately

If you are using reusable, multiple dose syringes, it is imperative that you do not clean them with any type of disinfectant. Disinfectants will kill MLV vaccines and damage killed vaccines. It is recommended that these syringes be cleaned with water and then disinfected with boiling water prior to their next use. These syringes should be completely disassembled between uses to ensure thorough cleaning. After cleaning, they should be stored in a clean, dry place (e.g. a Ziploc bag).

It is essential that these syringes be dedicated to vaccines and vaccines only. Never use a multiple dose syringe to give antibiotics one day and a vaccine the next. Plastic disposable syringes can be used for vaccination but can be inaccurate when used for giving multiple doses of vaccine to multiple animals.

Prevent contamination of the vaccine while in use

Never enter a bottle of vaccine with a used needle. Changing needles prior to each filling of the syringe will not only help keep vaccine clean, but will also make sure needles are sharp.

Read all labels and keep records

Administer the recommended dosage of vaccine. Some products are labeled for a 2ml subcutaneous (SQ) dose while others may require administration of 5ml intramuscularly (IM). Occasionally, a product may change its label directions to better comply with Beef Quality Assurance (BQA) guidelines. It is essential that you are familiar with the products you use and frequently reevaluate them to ensure you are abiding by current recommendations. If the vaccine recommends a booster in the future, always give that booster and give it at the recommended time. This will help ensure optimum immune responses develop.

While some vaccines are labeled for use in pregnant cattle, their use in that population of animals comes with certain guidelines. Failure to follow these guidelines can result in abortions that can significantly impair farm productivity. In addition, be careful when using MLV vaccines in close proximity to breeding season (less than 30 days prior to beginning of season). MLV vaccines can impair fertility if too little time is given between vaccination and breeding.

It is important that you record all serial and lot numbers as well as expiration dates for the vaccines you use. Should you observe an adverse reaction to a vaccine, this will be important for reporting the reaction to the company that produced the vaccine. Any vaccine that has expired should be thrown away.

Follow your veterinarian's advice

Discuss your vaccination needs with your veterinarian and follow their advice regarding the appropriate vaccines for your farm and the timing of their use. Never mix two different vaccines in the same syringe or bottle unless the manufacturers' labels recommend this approach. Be careful not to administer too many vaccines at any given time. Vaccine "stacking," as it is sometimes called, may result in negative side effects such as abortion or intense depression in cattle. Your veterinarian can help decide which vaccines to use at the same time and which may need to be administered at a later time.

Follow BQA guidelines

Always use proper injection sites and routes. In cattle, all injections should be given in front of the shoulder, and no exceptions should be made (Figure 1). NEVER administer injections in the hip or

round of cattle. When possible, only choose products that are labeled for SQ administration. If a product is labeled for either IM or SQ administration, always choose the SQ route. Use the smallest gauge needle that is appropriate for the task. For most vaccines labeled for SQ administration, an 18-gauge, 5/8-inch needle will be appropriate. If a product is labeled for IM administration, a 16-gauge or 18-gauge, 1-inch needle will be suitable.

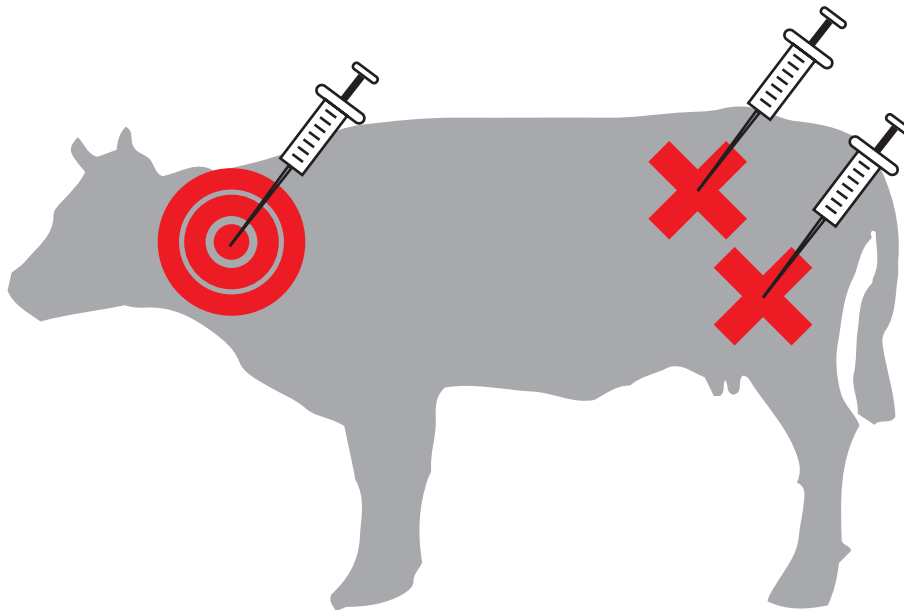


Figure 1. Appropriate injection site location.

While these guidelines will help improve the success of your vaccination program, no set of recommendations or vaccination program, regardless of the amount of detail and planning, will be effective if management is lacking. Proper nutrition, parasite control, stocking density, and stress management, just to name a few, are all important components of animal health. Vaccines are a piece of the puzzle and should not be relied on as a crutch for poor management.

When developing a vaccination program, always consult your veterinarian. They should have a good working knowledge of your management scheme and, along with their knowledge of immunology and infectious diseases, can help design a program that best fits your farm.

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