



CHUTE SIDE CATTLE WORKING

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A preventative health plan is essential when preparing weaned calves for the next segment of the industry (as a stocker or feeder). When the plan fails and illness surfaces, the first suspicion is a failure in the vaccination program. There are numerous explanations for these failures: an overwhelming pathogen challenge, stress, immunological immaturity, improper nutrition, genetically limited immunity, poor quality vaccine and improper vaccine handling.

Improper handling or administration renders any vaccine ineffective. Producers too often overlook critical considerations when preparing and administering vaccines. With the increased use of Modified Live Virus (MLV) and chemically-altered (CA) vaccines, many producers need to reevaluate how they handle biological products. Both MLV and CA products must be reconstituted with a sterile diluent prior to being administered to cattle. These products are routinely used in the stocker and feeder segments of our industry with excellent response, where processing speed is considerably faster than on most cow-calf

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operations. Processing facilities are also more likely to be sheltered from exposure to environmental hazards during processing. Most cow-calf operations lack covered or protected working facilities. Therefore, cattlemen must exercise more caution when handling and administering MLV or CA products.

Common handling mistakes can render MLV products inactive and even greatly reduce the effectiveness of Killed (K) vaccines and bacterins. Avoid these common mistakes during procurement, storage, handling and administration of vaccines.

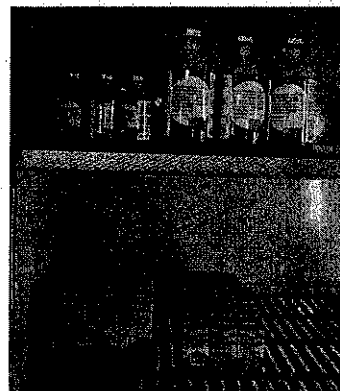
Remember, vaccination alone does not guarantee immunization.

Select the Best Product:

Purchase vaccine from a reputable supplier. Vaccine will be less than 100% effective if it has ever been unrefrigerated. Left unrefrigerated for an extended period of time (few hours), vaccine loses 100% of its effectiveness. Maintaining a high level of efficacy is critical to establishing immunity in a majority of vaccinated cattle. For example, if the vaccine is only 80% effective and 80% of the cattle respond to the vaccine, only 64% (80% x 80%) of the vaccinated animals are protected against the targeted pathogen. Management practices can increase the percentage of cattle that respond to vaccine and maximum efficacy of the vaccine greatly enhances immune response. Reducing exposure, stress, improved nutritional management, along with proper timing of vaccination, will increase the immune response to vaccine.

Keep it Cold and in the Dark:

When purchasing product, always transport it in a closed, refrigerated container. Refrigerate vaccine and protect it from UV exposure from purchase until administration. Use refreezable cool packs when transporting vaccine. These should be available at the point of purchase.



Protect Vaccine Chute side:

Most beef producers fail to handle vaccines correctly at the time of vaccination. Always keep vaccine and syringes refrigerated while processing cattle. Keep any opened bottle(s) in a cooler with syringes. Store all unopened and unmixed product in a closed refrigerated container until needed. Never mix MLV or CA product before it is needed. Mix only enough to be administered within thirty minutes. Mixed vaccine begins to lose effectiveness in a relatively short period of time (minutes).

Don't Disinfect with Chemical Sterilants:

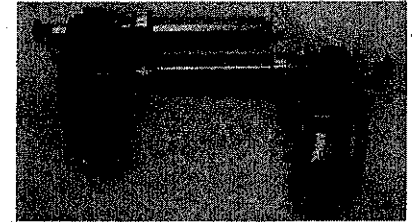
Do not disinfect syringes or needles used to administer vaccines with chemical sterilants. All sterilants will kill MLV vaccines and damage K products. Sterilizing syringes



with chemical sterilants is a common practice that must be stopped. Only use boiling water to disinfect syringe components. Do not use alcohol, soap, Betadine®, Nolvasan® or Chlorox® to clean or disinfect syringes. Residue left in the syringe compromises the effectiveness of the product. Although this contamination primarily affects the first draw, it could impact the immunization of several animals. A 50cc syringe could impact from 10 to 25 animals depending on whether it was set to dispense a 2 or 5cc dose.

Use Quality Sterile Syringes:

Selecting the appropriate syringe is very important in the implementation of a sound vaccination program. Multiple dose syringes (shown in adjacent picture), or sterile disposable syringes are appropriate for administering sensitive vaccines. Note the different size barrels on multi-dose syringes. Typically the 25 cc capacity syringes (upper left) are better suited for 2 cc doses, while the 50 cc capacity syringes (lower right) work well with 5 cc doses.



Multiple dose syringes need to be completely disassembled after each use. Do not use disinfectants to clean components. Disassemble, boil components to sterilize and store in a clean, dry sealable bag or container.

Many continuous feed syringes (a tube connects syringe to product) cannot be cleaned effectively because they cannot be disassembled and boiled. However, they can have boiling water drawn through them to effectively clean these syringes. Use caution – boiling water often damages this type of syringe. Even if a continuous feed syringe can be disassembled and adequately disinfected, several other problems remain with this type of delivery mechanism (controlling temperature of vaccine in the tube, protecting the vaccine from UV light, etc.).



New disposable syringes are a sterile delivery instrument. These plastic syringes can be very accurate when used for single dose delivery. However, when used for multiple dose delivery, they are often very inaccurate. For example, a 5cc syringe effectively delivers single 2 or 5cc doses, but attempting to administer multiple doses often results in over or under dosing. This problem is magnified when using 10 to 60cc syringes.

One disadvantage of plastic syringes is the tendency for the tip to break while vaccinating an improperly restrained animal. When this happens, discard the exposed and contaminated product with the syringe. Attempting to transfer the exposed vaccine into another syringe increases the chance of contamination and thereby could reduce immunization of subsequently vaccinated animals. Draw a single dose for each individual animal. If syringe damage occurs, only a small amount of product is lost. Leave a sterile needle in the working bottle which is kept in the working cooler. Never enter any bottle of vaccine with a used needle.

When using multi-dose syringes, change needles prior to each filling of the syringe. This practice will prevent contamination of vaccine and help ensure needle integrity and sharpness.

When single dose or disposable syringes are being used, a sterile needle is often left in the stopper of the working bottle. While it is important to not enter a bottle with a used needle the practice of leaving a needle in the working bottle will lead to rapid contamination of the vaccine. After each filling when the working needle is the vacuum is lost and the result is contaminated air particles are drawn into the vaccine. When using single dose or disposable syringes it is best to change needles for every fill just as when using multiple dose syringes.

Quality and accurate calibration of syringes is crucial. Even slight changes in working components can change the volume dispensed. Components can break or bend without being detected. Inspect carefully. Some multi-dose syringes are not accurate enough for low dose (2 cc) products. Always keep spare parts readily available in case something happens to the working syringe. Keep a supply of extra disposable syringes as an excellent backup delivery system.

Lubricate with First Vaccine Draw - No Petroleum-Based Products:

Use the first draw of vaccine to lubricate the syringe. Do not lubricate syringes with petroleum-based lubricants. Prohibited lubricants include silicone, mineral oil, Vaseline®, vegetable oil or any other lubricant, whether petroleum based or not. All of these lubricants can inactivate MLV or CA products. These products may also compromise the efficacy of K products. If the O-ring on the plunger is so difficult to move that lubricant is necessary, replace the O-ring or the syringe.

Protect Vaccine from Heat and Light:

Do not leave vaccine or syringes in direct sunlight, even for a short time. Sunlight and ultraviolet light (UV) will inactivate vaccines. Do not leave syringes on working tables, barrels or pickup tailgates while performing other processing chores at the chute. The pictures right and below demonstrate practical, low-cost methods to keep syringes cool and out of direct sunlight while maintaining easy accessibility. Simply putting a syringe in a cooler while not in use is a satisfactory procedure.



Avoid exposure of vaccine and syringes to heat. Sunlight heats up syringes dramatically. Always cool down syringes before the initial draw of vaccine. Carrying syringes in the cooler while going to the cattle handling facility allows sufficient time for the syringe to cool before drawing up the first vaccine. If the needle/syringe is not in use, put it in a cooler. If any delay occurs in processing, place syringes back in a

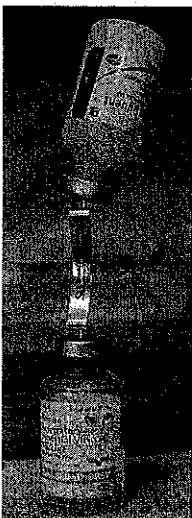
cooler immediately. A cooler or bucket as shown keeps syringes from prolonged exposure to UV light throughout processing. Exposure would only occur from the cooler to the chute and back to the cooler.

Proper syringe handling does not appreciably increase processing time. If continuous feed syringes are used, the bottle, hose and syringe must be protected from exposure to UV light. It is very difficult to keep all components of a continuous feed syringe sheltered from exposure to the elements. A better use of these syringes is for administering less heat/light sensitive materials such as anthelmintics, antibiotics or vitamins. Never use a syringe to administer antibiotic or anthelmintic, then subsequently administer MLV, CA or K vaccine. Any residue affects the vaccine.

This brings up another problem with continuous feed syringes. How can the bottle and syringe and supply tube be kept cool and protected while carrying it chute side? Many times these bottles and syringes are suspended chute side in direct sunlight and exposed to heat during processing. This results in deterioration of the vaccine and inadequate immunization.

Take two coolers to the processing area. Keep all unopened vaccines in a tightly closed, refrigerated cooler. The intent is to minimize exposure of unused product to temperature fluctuations and contact with light. Working bottles can be kept in the second cooler with syringes. Label syringes and the cooler box prior to processing to prevent accidental mixing of vaccine when refilling syringes. Accidental mixing of two vaccines will result in under dosing and may render one or both of the vaccines ineffective. Mixing MLV product with a non-water based K product destroys the MLV product immediately. The inadvertent mixing of product (which all too frequently occurs during processing of cattle) can be eliminated by attention to details and proper labeling.

Mixing and Drawing Vaccines:



Mix only as much MLV or CA vaccine as will be used in 30 minutes or less. MLV products must be used immediately after mixing. They cannot be stored for later use. Partially used bottles of killed vaccines can be refrigerated for short periods of time (24 hours), but they should not be kept if anything other than a sterile needle was used to draw vaccine. Use a sterile transfer needle when mixing MLV and CA products (see adjacent picture). Transfer needles can be sterilized and re-used. Transfer needles minimize product contamination during mixing. If a transfer needle is not available, use a sterile syringe to draw the diluent out of the plastic bottle and then insert the needle into the glass vial.

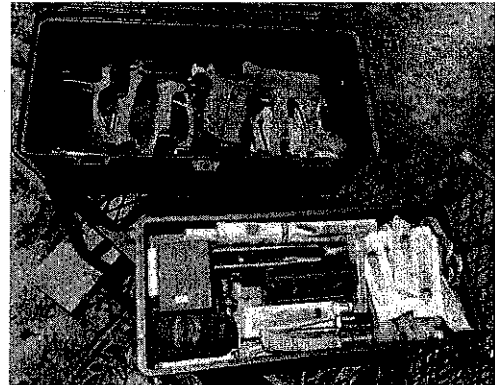
When using a transfer needle, begin by inserting the transfer needle in the stopper of the plastic bottle, invert the needle and diluent and insert the other end of the transfer needle into the stopper of the glass vial containing the freeze-dried MLV. The glass vial has a vacuum drawn on it that will be lost if the transfer needle is inserted into the glass vial first. If the vacuum is lost, the diluent should be drawn (sterile syringe and needle) and pushed into the vial containing the freeze

dried MLV fraction.. After proper mixing (gentle agitation, not violent shaking), vaccine can be drawn from the glass vial into the syringe.

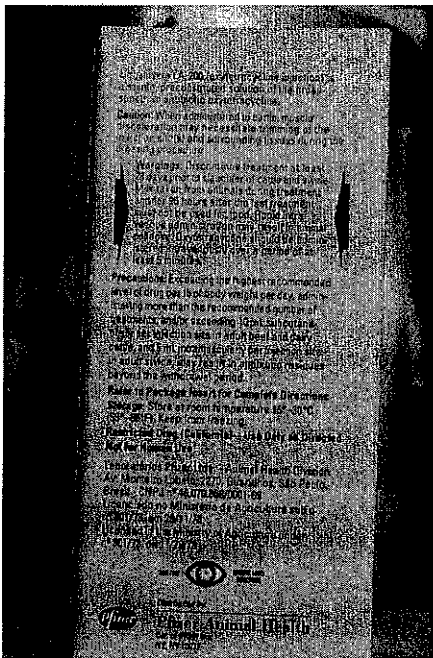
Remember - Never draw from a bottle with a working needle that has entered an animal. Though this is a common practice, it likely contaminates the remaining vaccine. Adopt the practice of changing needles before refilling a syringe to keep needles sharp and the vaccine free of contamination.

Inspect and Maintain Equipment:

Good equipment is expensive and should be cared for. If processing cattle in more than one location, keep all equipment together in a readily portable container. Always inspect syringes prior to processing. Check the barrels for chips or cracks which would result in leakage, wasted product and under dosing. Check calibration and dosage setting prior to and continuously throughout the process. Dose setting on some syringes can fluctuate very easily leading to under or over dosing.



Read Labels - Dose Properly:



Selecting the most appropriate product and route of administration are fundamental **Beef Quality Assurance** best management practices. **Read the label** to determine dose. Many products are now administered in low dose (2cc) volume to reduce injection site reaction. Some products are still formulated to be delivered in a 5cc dose.

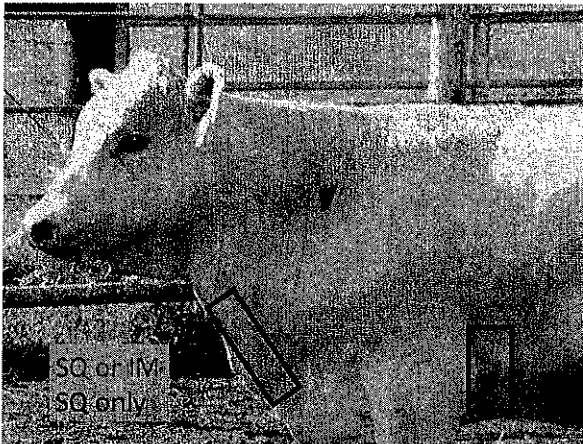
Some products may be 2cc when administered alone, but 5cc when other products are included in the dose. One example is found in the CA products Cattlemaster®4 and Cattlemaster®4-VL5. Cattlemaster®4 is a 2cc product while Cattlemaster®4-VL5 is a 5cc product. **Always read label and dosing instructions prior to processing.** Dose or approved route of administration for some products has changed. Take time to become familiar with the products. Also, check for side effects and treatment should they occur. Should cattle experience a reaction, intervention must occur

immediately to prevent death.

Follow label directions for all products. Booster vaccines as specified on the label. To establish immunity, almost all products require a booster vaccination 2 to 4 weeks after the initial immunization. If a booster is required one initial dose will not achieve full immunity. At best, one dose provides a temporary immune response. Sustained levels of immunity capable of preventing illness can only be established by boosting initial vaccinations.

Minimize Injection Site Blemishes:

Select the proper injection site and use the route of administration specified on the label. When possible, administer vaccines in front of the shoulder (see picture below). Intramuscular (IM) injections should be given 2 to 3 inches below the top of the neck and 4 to 6 inches in front of the shoulder. Inject all IM products by inserting the needle perpendicular to the neck. Subcutaneous (Sub-Q) injections should be given in the neck region using the tent method or behind the foreleg in the elbow pocket. For more information on administering vaccine to cattle, refer to Texas A&M Agrilife Extension Service Bulletin B-5028, *Administration of Medicine and Vaccine to Cattle*.



Appropriate injection sites for **ALL** injectable products are shown in this picture. Almost all beef cattle vaccines and antibiotics can be administered with a 1" long 16 or 18 gauge needle. Always use the smallest needle possible when vaccinating (20 gauge and smaller needles should never be used).

Note: The smaller the gauge number, the larger the needle diameter. A 16 gauge is a larger diameter needle than an 18 gauge. Eighteen gauge needles work well for water-based products such as most MLV and CA vaccines. For oil based products such as some antibiotics and a few vaccines, product is more easily dispensed through a 16 gauge needle.

A 5/8th " to 1" needle is sufficient for IM and Sub-Q injections in calves. A 1" needle should be used for IM injections in yearlings and mature cattle. A 5/8th to 1" needle can be used for Sub-Q injections on older cattle.

If label directions offer either Sub-Q or IM, choose the Sub-Q route of administration. It is less intrusive and less damaging to muscle tissue. Research has shown that tenderness is affected in a 2-3 inch radius around the injection site, even when a lesion is not observed. This negative effect on tenderness is reason to avoid injections in the hip (think sirloin) or round. The industry cannot afford bad eating experiences, particularly those so easily prevented.

These are some of the major 'easily remedied' factors associated with the success or failure of immunization programs. All of the above can be rendered ineffective if the nutrition, handling, stress and genetic components of the immune system are not in proper balance.

Detailed information on how to manage these additional components of immunity is available. All are dependent upon the effective management of the total production system. There are no easy answers in cattle management. Maximizing production efficiency requires a truly integrated management system. How well it works depends on the beef producer's ability to implement and manage all the components together.

CRITERIA FOR EFFECTIVE VACCINATION
Determine target pathogens
Select the most effective vaccine
Prevent exposure of vaccine to heat and light
Use only sterile needles and syringes
Draw from bottle with sterile needle
Use quality syringes
Inspect and maintain all working components
Administer proper dose
Use proper needle size
Administer recommended route IM or SubQ
Administer in recommended site, neck region
Change needles often to reduce tissue irritation
Always follow label directions
Booster all vaccines when label requires it

NEVER
Leave vaccines in direct sunlight or UV light
Leave vaccines unrefrigerated
Allow vaccines to freeze, especially killed products
Place a used needle in a bottle of vaccine
Place vaccine in hip or upper round
Fail to read directions before starting
Assume anything, always check

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