UCD VET VIEWS
CALIFORNIA CATTLEMAN, OCTOBER 1995

QUALITY ASSURANCE AND VACCINES

For those beef cattle producers who have been certified by the California Beef Cow/Calf Quality Assurance Program, the fact that vaccine selection and vaccine use can have a major impact on animal health and carcass quality comes as no surprise. There are two important categories of problems that can occur subsequent to vaccine use: (1) the vaccine(s) fail to protect against disease (fail to create adequate immunity to disease), and (2) the vaccine(s) cause tissue damage at the injection site when administered. The failure to protect against disease results in animals that become ill later and require treatment. Both the illness and the treatment are expensive. Also, tissue damage can result from the drugs used for treatment and this results in further losses and decreased carcass quality. Vaccines can also result in tissue damage at the site of injection due to a number of common reasons that are addressed below.

Cattle can fail to develop immunity and therefore not be protected against disease for a number of common reasons that are listed (Table 1):

Table 1. Common Reasons for Vaccine Failure in Cattle

Time (not enough)
Malnutrition
Immune Status
Parasites
Vaccine Selection & Quality
Vaccine Handling
Stress

Time:

From the time an animal is vaccinated until the immune system begins to protect the animal is a ***minimum*** of 2-3 weeks. This is the time required for the cells of the immune system to produce the antibodies, other proteins, and immune cells necessary to protect against the disease organism(s) contained in the vaccine. Protection with some vaccines require a ***booster vaccination*** and more time than 3 weeks, with some as much as 6 weeks before the animals are protected. If the animals are exposed before adequate time they will not be protected.

Malnutrition:
Animals on diets low in energy and/or protein that cause weight loss do not respond normally to vaccines and will not develop immunity in a normal manner. Also, a number of trace nutrients and vitamin deficiencies will cause the cattles' immune system to be unable to respond to vaccines in a normal manner. These nutrient deficiencies that damage the immune system include copper, selenium, zinc, and vitamin E, to mention a few.

Immune Status:
The immune system of young animals, particularly calves less than 3 months of age, is not fully developed and responses to vaccines can be less than necessary. The antibodies that calves have from their mothers can interfere with vaccination responses, also. Some viral infections, such as BVD virus (Bovine Virus Diarrhea) alter the immune system and decrease the animal's ability to respond to vaccines adequately. Also, parasites decrease the immune function and parasite control is important for adequate immune response.

Vaccine Selection & Quality:
Be sure that vaccines selected for your cattle will give protection against the diseases to which your cattle will be exposed. If Trichomoniasis or Anaplasmosis are not problems in your herd, there is no need to vaccinate against these agents. Use top quality vaccines to insure that your animals will receive the level of protection they need. For example, the older *Pasteurella* bacterins did not give good protection, while it is hoped that the newer modified live *Pasteurella* vaccines that are given as intradermal injections will be more effective. Talk at length with your veterinarian to be sure that the vaccines selected for your cattle will be the ones that really will do the job for you.

Vaccine Handling:
Shipping and storage of the vaccines to be used on your cattle should be done to be sure that the products will be effective when administered. Vaccines that arrive to you on a hot day in the summer without frozen ice packs should be sent back. Heat, sunlight, and freezing destroys almost all vaccines. Read the label and follow all instructions regarding storage, mixing and handling of vaccines. Vaccines that are mishandled are not effective and are a waste of time to administer. When using vaccines at the chute, keep the vaccines out of the sun, refrigerated and prevent freezing (winter). An insulated ice chest does very well in this regard and also keeps the dust off the vaccine vials.

Stress:
Animals that are stressed (weaning, parasitism, shipping, salesyards, etc) simply do not handle vaccination well. Animals should be vaccinated prior to stressful events or after they have had time to adjust to new conditions. Stress is a relative phenomenon and your veterinarian can give you good advice regarding the trade-offs between vaccinating

newly arrived cattle and waiting until they acclimate.

A number of procedures can result in tissue damage at the injection site when vaccines are given to cattle. Always be sure to ***read the vaccine label carefully*** as each vaccine product requires different procedures to be used effectively. ***Never mix different vaccine products in the same syringe***. This could inactivate both vaccines and cause tissue damage to the animals that could lead to abscess formation. Try to use vaccine products that are administered subcutaneously (sub-Q) instead of intramuscularly (IM). Some of the modified live virus vaccines are given intranasally and where applicable could be used in place of either a sub-Q vaccine or an IM vaccine. However, never give a vaccine meant to go sub-Q or IM, intranasally as it will not be effective. Keep all needles clean and use disinfectant and new needles as needed. ***Do not use disinfectant when using modified live virus vaccines, however***. Inject only into clean areas of skin. If you drag dirt or manure into the vaccine site it will cause an abscess or infection which will lead to damage of the tissues. Be very cautious about using vaccines in an off-label or extra-label manner, these products have not been proven to be safe or effective and tissue damage is more common with uses of this type. Be particularly cautious of "autogenous" vaccines as they can be extremely irritating to tissues and can be associated with severe injection site reactions. Discuss any vaccine decisions with your veterinarian to be sure that you are using the most appropriate products for your herd and you are giving them in the best possible manner to prevent injection site reactions. The precautions discussed above are some of the more important common ones; however, as you know, quality assurance really is a matter of paying attention to all the details.

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