



Texas Agricultural Extension Service

The Texas A&M University System

Factors Affecting Vaccination Response

Apart from the mechanics of injecting vaccines the vaccination process appears to be simple. Many owners assume that their animals are fully protected against the disease conditions for which they have been vaccinated. Unfortunately, this is not always the case.

Injection merely exposes the animal to vaccine antigens. The animal must respond appropriately with the production of antibodies to produce immunity. This response not only requires 7 to 10 days; but it also requires that the immune system of the animal be *intact and fully functional*. Several elaborate mechanisms and numerous body systems are involved in the successful production of antibodies and immunity in an animal.

Many producers have experienced varying degrees of vaccination failures in their livestock. In a "normal" population of livestock, the immune response never confers absolute protection. The degree of protection varies among the members of a vaccinated population. While most animals tend to respond to vaccines by mounting an average immune response, a portion will mount a very poor immune response and may not be protected against infection in spite of vaccination. Vaccination failures can result from:

- Improper storage of vaccines
- Improper handling and administration of vaccines
 - Improper reconstitution
 - Failure to mix well
 - Contamination of syringe (bacterial or disinfectants)
 - Contamination of multidose containers
 - Indiscriminate mixing of vaccines/antibiotics
 - Using a product beyond the expiration date
 - Wrong site of injection
 - Improper dosage

- Animal failure to mount an immune response
 - Heavy parasitism
 - Malnourishment
 - Existing infections
 - Stress
 - Pregnancy
 - Extremes of environment (cold, heat, wind moisture)
 - Fatigue
 - Dehydration
 - Immunological incompetence—genetic inability to mount a normal immune response

A large number of cattle may not respond to vaccination by producing immunity/protection. Certain groups of animals have been identified as high risk for poor vaccination response. These include:

- Young calves - less than 500 pounds
- Green cattle - straight bred fresh calves shipped direct from the ranch of origin
- Highly stressed cattle

Double vaccination 7 to 10 days apart appears to reduce death losses and total numbers of treatments in these problem groups. Administer initial vaccination when possible prior to weaning or shipment. Use only killed viral vaccines in unweaned calves. Modified live vaccines can be shed from the calf to the cow and may cause abortions.

This information was prepared for the 1984 Texas Beef Conference by R.W. Sprowls, D.V.M., Texas Veterinary Medical Diagnostic Laboratory, Amarillo.