

Vet's Corner: New Thoughts about Vaccinology

At a recent Vet to Vet meeting, Dr. Chris Chase, So Dakota State U, discussed several new thoughts about bovine Vaccinology which affect route and timing of administration.

Under the skin route (SubQ) of administration gives the best response to vaccines, because the dendritic cells are located there. When introducing a specific antigen by vaccination, the dendritic cells are the KEYSTONE because they contain the receptor that recognizes all pathogens and antigens. After antigen is injected SubQ, the dendritic cell takes the antigen to the lymph node, where a complex chain of events ensues which produces an immune response or memory to respond to a future exposure (anamnestic response).

Poor response to a vaccine can occur if the immune system is already responding to stress of chronic disease or parasites. If the immune system is actively fighting off parasites, the counter pathway which produces memory will be overcome and there will be poor anamnestic response. The new vaccines are working best in the best management systems. They are not a “silver bullet”, which overcomes poor sanitation, nutrition, and/or ventilation and/or a heavy parasite load.

Immunity of the newborn begins at 150 days after conception, but is suppressed in the uterus and gradually improves over the first weeks after birth. If the newborn immune system was not suppressed, the dam's system could reject the fetus as a foreign body and abort.

New research is finding the time when newborn calves will respond to vaccines. Generally, there is a good cell mediated response to intranasal and SQ vaccination with virals such as IBR and BVD in the first three days of life. BRSV maternal interference may last 17-35 days, so it may be necessary to booster after three weeks for BRSV. Bacterial antigens such as Mannheimia, Pasteurella, and Clostridials tend to respond later so these vaccines should wait until 3-5 weeks old.

The best timing for booster vaccinations is to wait at least 20 days because apoptosis (culling of poor T-cells) has had time to be completed. Best anamnestic response will be achieved by stimulating the best T-cells, so wait at least three weeks between boosters.

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