

## **Optimum Vaccination Time For Feeder Calves**

By

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A cooperative study under the direction of Dr. I.A. Schipper, formerly of the Veterinary Diagnostic Laboratory, North Dakota State University, Fargo, was conducted at three Branch Experiment Stations (Dickinson, Carrington, and Streeter) and the Main Station, N.D.S.U., Fargo to determine the effect that vaccination time has on feeder calf antibody production.

Investigations have demonstrated that it requires two administrations of either inactivated or attenuated vaccine to achieve maximum antibody titer. It is also well established that a three week period between vaccinations is necessary to obtain maximum antibody titer from the second, or booster vaccination.

It has been repeatedly demonstrated that when cattle are under stress the serum corticosteroid levels increase. Increased corticosteroid levels interfere with the immunological activity of the animal's immune system. Weaning is a stress period. The usual practice of vaccination at weaning is frequently recommended without justification based on documented experimental data that would indicate the degree of protection obtained from such procedures.

The purpose of this investigation is to determine the immunological response of feeder calves following vaccination at pre-weaning, weaning, and post weaning.

To evaluate the various vaccination times calves received two intramuscular vaccinations of inactivated IBR and BVD vaccine at three week intervals according to the following schedule:

- |           |  |
|-----------|--|
| Group I   | Vaccinated twice, initially at six weeks and then booster at three weeks before weaning. |
| Group II  | Vaccinated twice, initially at three weeks before weaning and boosted on weaning day.    |
| Group III | Vaccinated twice, initially one day post-weaning and three weeks after weaning.          |

All calves were bled before each vaccination and three weeks following the final vaccination. Blood serum antibody titers for IBR and BVD have been determined by serum neutralization for each period of blood sampling.

In addition, personnel at the Carrington Irrigation Station, under the direction of Vern Anderson, Animal Scientist, administered inactivated BVD vaccine intranasally.

The combined results from all Stations are shown for attenuated BVD virus vaccine in Figure 1, and Figure 2 depicts results from calves used at the Dickinson Experiment Station only.

### **Summary:**

Several things were gleaned from this study that should be useful to cattlemen in their animal health program, but will no doubt require additional work. First, there was no measurable difference in the quantity of antibodies produced by either attenuated or inactivated vaccines, and, regardless of the type of vaccine, it requires two vaccinations to produce maximum blood serum levels of antibodies. Very minimum, or no antibody production was produced following the first administration of either attenuated or inactivated vaccine.

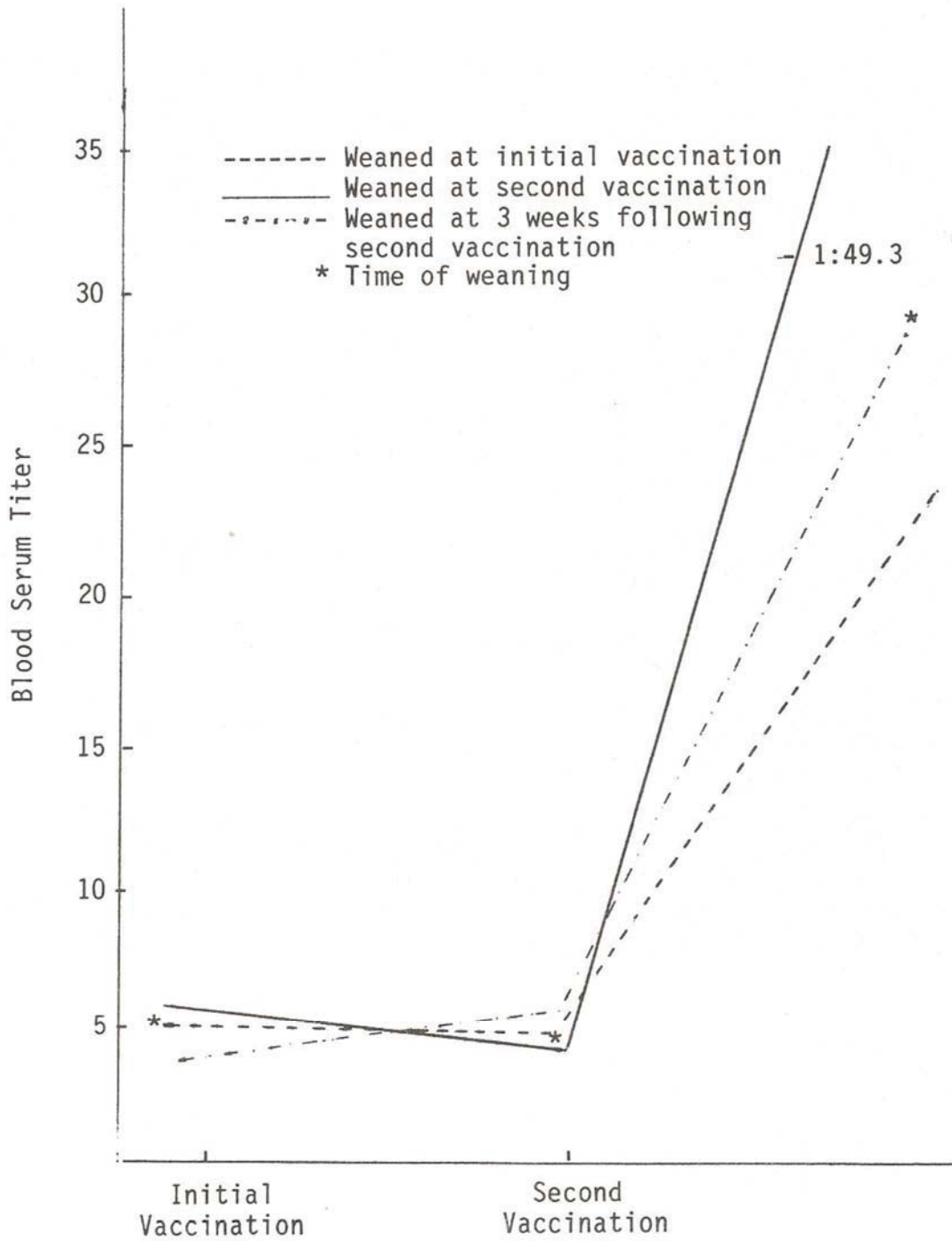
It appeared from the antibody analysis that if passive immunity exists at the time of initial vaccination there will be an antibody loss which will be quantitatively replaced following a second vaccination. However, if the calf has been exposed to natural infection previous to the initial vaccination, the initial vaccination will stimulate antibody production comparable to a booster vaccination.

Weaning does influence antibody response following vaccination if weaning occurs at initial or at the time of the booster vaccination. The result is decreased antibody titer and more rapid decay of antibody titer when vaccination and weaning occur simultaneously.

The last information gleaned from this investigation was that when attenuated IBR virus vaccine was administered intranasally no increase in blood serum antibody titer was detected.

This year's calf crop will be used to evaluate the interval required between the initial vaccination and the booster vaccination. While we know that a three week interval will generate strong antibody titers, the question rises as to the strength of antibody titers when booster vaccinations are given at either one or two week intervals as well as three week intervals.

**Figure 1: BVD Vaccination Versus Weaning.**



**Figure 2:** Dickinson Experiment Station BVD Titers

