

Passive Transfer Research Study

Introduction:

The process of moving antibodies from the mother to her offspring is called 'passive transfer'. In passive transfer the IgG Immunoglobulins stored in the cow's colostrum provides antibodies to infectious agents that she has been exposed to or vaccinated against. This protects the newborn calf until it can start producing its own IgG in sufficient amounts to protect itself. This begins to happen in the calf's own body somewhere between 30 to 80 days of age so the antibodies the calf obtains from its mother are necessary and critical until then.

Purpose of the Research Study:

The purpose of this study was to analyze the effect EZ Plus Calf Start had on the level of antibodies that were transferred from the colostrum of the cow to her calf.

The Importance of the Trial:

Research proves that the higher the level of antibodies that can be obtained by the newborn in those first few hours of life, the higher the survival rate and even subsequent overall health, weight gain and performance is obtained. This means higher feed conversion, growth and weaning rates, less scour days and lower death rates than calves that get lower antibody levels from poor or late ingestion of colostrum.

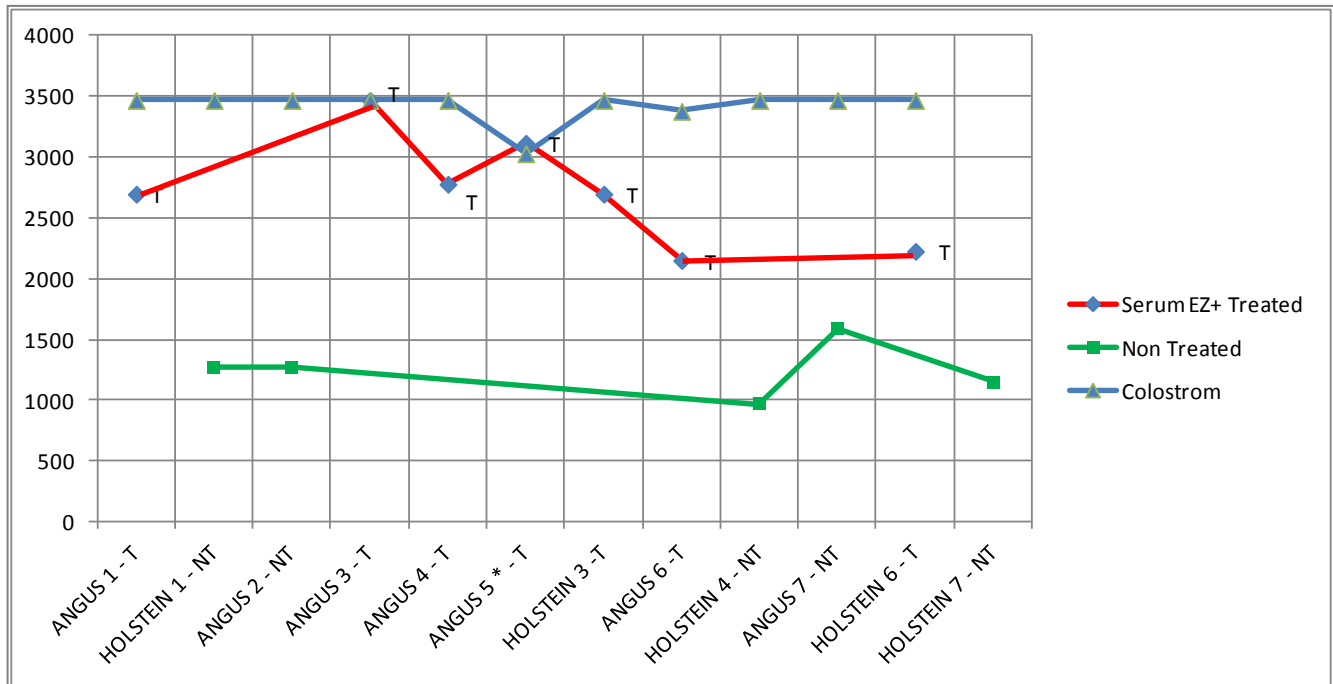
When the newborn is unable to obtain an adequate volume of these antibodies because it does not receive colostrum or it is not received in a timely manner it is called 'failure of passive transfer'. This is considered to be the case with titer values of 400mg/dl or less of IgG antibodies. These calves generally do not survive or at best have significant health problems and show a significant failure to thrive syndrome.

Methodology:

The study used both Angus calves from a Cow/Calf Beef operation as well as Holstein calves from a local Dairy. Both farm entities were located in Utah and were typical of those seen throughout the State and Nation. Radial Immunodiffusion was chosen because this test provides an exact titer which is more useful than a range value that is reported with standard Agglutination Tests. This test can initially determine titer values from 0 to 3467.2 mg/dl. Values above this level require dilution and re-testing to get a value which was not done in this study.

The Angus calves were allowed to suckle while the dairy calves were given colostrum from a colostrum storage bank housed and maintained on site at the dairy farm. One group of the calves in the study received EZ Plus Calf Start shortly after birth while the rest were not treated with this product to serve as controls for the research. A colostrum sample was also taken and analyzed from each of the dams to insure adequate antibodies were available initially. A blood sample was drawn from these calves approximately 48 hours after birth to allow adequate time for passive transfer to take place and then the antibody levels between the treated and untreated groups were compared.

Study Research Graph and Data:



Bovine IgG RID results (mg/dl)

<u>Sample #</u>	<u>Breed</u>	<u>Treatment Group</u>	<u>Serum</u>	<u>Colostrum</u>
Sample 1	Angus	Treated with EZ – Plus	2695.9	>3467.2
Sample 2	Holstein	Not – Treated	1266.0	>3467.2
Sample 3	Angus	Not-Treated	1266.0	>3467.2
Sample 4	Angus	Treated with EZ – Plus	>3467.2	>3467.2
Sample 5	Angus	Treated with EZ – Plus	2777.7	>3467.2
Sample 6	Angus	Treated with EZ – Plus	3114.6	3028.9*
Sample 7	Holstein	Treated with EZ – Plus	2695.9	>3467.2
Sample 8	Angus	Treated with EZ - Plus	2150.9	3377.6
Sample 9	Holstein	Not – Treated	969.7	>3467.2
Sample 10	Angus	Not – Treated	1586.8	>3467.2
Sample 11	Holstein	Treated with EZ – Plus	2225.8	>3467.2
Sample 12	Holstein	Not – Treated	1144.6	>3467.2

*This colostrum sample was not pulled until after the dam became sick and died, which is the reason the colostrum titer is so low and is less than the serum titer in the calf.

Summary:

Calves in the group treated with EZ Plus Calf Start had an average IgG titer of 2732.57 mg/dl while the calves in the Non-treated group averaged 1246.62 mg/dl. This was an average difference of 1485.95 mg/dl antibody titer. The calves in the treated group had an over one fold increase in antibody titer from the non-treated group. These results were scientifically significant in that the treated calves measured a titer that was over twice that of the control group. In fact the difference in the titer values for the treated group was even greater than the base level that was achieved by the control group.

Analysis and Discussion:

By enhancing the environment in the digestive tract of newborn calves using EZ Plus Calf Start shortly after birth and during the critical time period when passive transfer is taking place antibody absorption is increased. IgG Immunoglobulins are large protein molecules and they transfer directly into the newborns blood stream from its digestive tract at specific sites where specialized enterocytes make this exchange possible. The highly oxygenated formulation in EZ Plus Calf Start aids and enhances this process making the exchange happen in a more efficient and effective manner. As indicated by this research study the calves in the treated group were better able to obtain and utilize the antibodies provided in their mother's colostrum. The final result showed that the total overall amount of antibody that is transferred to a calf during the passive transfer process is elevated using this product.

Conclusion:

Calves treated with EZ Plus Calf Start had an IgG titer that averaged 1485.95 mg/dl higher than the calves in the Non-treated control group. This computes to an average 119.83% increase in antibody titer in calves treated with this product at birth. Because research proves that higher antibody levels produce better overall health and performance in calves this product is highly beneficial. This study shows a producer could expect over double the amount of antibody transfer to take place using EZ Plus Calf Start.

Research Study Over seen by Robert K. Erickson, DVM

Antibody titers were determined using a Radio Immunodiffusion Test at Utah State University by the Utah Veterinary Diagnostic Laboratory.