Immune Response Test for Cattle Breeding and Health Management

Annual Report

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This is a project summary of activities of the HIR Project (Immune Response Test for Cattle Breeding and Health Management) which began on January 7, 2017 through August 30, 2017. On January 7, 2017, 285 Crossbred cows (adult females of varying ages of Bos taurus-Bos indicus type cattle) from the G7 Ranch were individually identified and a whole blood sample (red top tube) was collected prior to administration of any immunizations. After the initial baseline Day 0 (D0) blood sample were drawn, the cattle were subcutaneously immunized with TRICHGUARD V5L™ vaccine manufactured by Boehringer Ingleheim Vetmedica Inc. (BI). The individual blood samples were analyzed by Dr. Qun Treen Huo, Ph.D. using the D2Dx™ Assay to determine a baseline response.

On January 14, 2017 (Day 7 post immunization-D7) the above cattle were processed and 277 of the above cattle received whole blood sample (red top tubes) draws which were subsequently analyzed by Dr. Huo using the D2Dx™ Assay. These results of the two blood draws were compared and used to identify HIR status. Dr. Huo classified 121 cows as High Immune Responders (HIR) which were identified as having test score above 4.0. The remaining 156 cows were identified as being Low Immune Responders (LIR) for study purposes. [Note: 7 cows of the original 285 cattle were not tested on 1/14/17 as these cows were not available for testing as they refused to be gathered due to very recently borne calves.]

The bulls to be used in the project to breed the test cattle were evaluated as described for the above cows. The bulls were individually identified and a health history was recorded. The statuses of the bulls had to be determined before the project was approved because the normal evaluations of these bulls had to occur prior to the project award date. The initial baseline whole blood sample draw (D0) was collected on December 12, 2016. The TRICHGUARD V5L™ vaccine manufactured by Boehringer Ingleheim Vetmedica Inc. was administered after the blood draw. The post immunization D7 blood draw on the bulls was collected on December 19, 2016. Dr. Huo stratified the results from the two blood draws to provide reference data of High and Low Immune responders. The initial plan was to maintain two separate herds of cattle – High and Low Immune Responding Cattle. However, due to the extreme drought in the project area, the herd owner was unable to maintain the two groups as totally separate herds. To prevent stratification bias issues because of this climatic variable that was beyond the control of the herd owner, only HIR bulls were selected to breed to the project cattle as a single herd.

As the participating veterinarian with the HIR Project, I have continued to monitor the cows and their offspring on at least a biweekly schedule. As of this date, 227 calves have been born to the 277 project cattle. All of the calves have been processed and are individually identified with a unique ear tag. The bull calves have been castrated, marked and branded, blood samples pulled pre and post vaccination as per the study protocol, weighed at the first blood test, and we have matched each calf with their dams (adult females) of the 277 project cattle.

As mentioned in the above paragraph, the calves have all had blood samples pulled pre and post immunization to determine an individual value of their High or Low Immune response status. This determination is made by processing the calves when they are at least 3 months of age. A whole blood sample (red top tube) was collected. After this initial D0 blood collection, the calves were administered two immunizations subcutaneously (Pyriamid®5 + Presponse and Vision®8 – BI). The health statuses of

these calves will be determined, a body weight taken and all information recorded. Dr. Huo will analyze the D0 blood samples using the D2Dx™ Assay to determine a baseline response.

Seven (7) days post immunization the calves were blood sampled with a second whole blood sample draw (red top tube). Dr. Huo will analyze the D7 blood samples using the D2Dx™ Assay to classify the calves into high and low immune responder status based on the same criteria used in the adult herd.

When the calves reach an age of 205+ days after birth, they will be weaned and either sent direct to a feedlot in North Florida or sent to another ranch locally to be preconditioned to be readied for shipment to the feedlot in North Florida. On the day of weaning and shipment individual weights of the calves will be recorded and compared to the initial weight taken on the initial preimmunization processing. Those calves undergoing the preconditioning process will be lighter in weight calves and are not at optimum weight to be shipped directly to the feedlot. The first calves to be weaned will begin the first week of September 2017 as per the agreement with the ranch owner and the feedlot. This process will continue over the next 60 days until all calves have been weaned and sent to either the feedlot or to the preconditioning operation. Both groups of calves will be monitored until they are sent to slaughter or retained by the ranch owner as replacement heifers and have reached 2 years of age.

In October 2017, all of the cows will be pregnancy tested to begin the Year Two data collection of this research project. This will allow the project to further record the correlated impacts of immune response status. These reports will be documented as the cattle and the information is processed.

To date the herd has suffered the loss of the following cattle:

One (1) Adult cow found dead in March 2017 and due to the advanced stage of decomposition cause and time of death was not able to be determined.

One calf was found dead at birth in March 2017 and due to the advance stage of decomposition cause and time of death was not able to be determined. The dam (mother) of this calf was not identified.

Two (2) Adult cows were recently found mired in mud in a drying up wetlands area as reported by the herd owner. One of those cows was found dead on their discovery in this critical situation and the second cow had to be euthanized for humane reasons. This situation was caused due to the advanced dry climatic conditions (and not due to a disease) currently being experienced in the area where the project herd is located. And one adult cow was injured and died during the spring deworming of the cattle in April 2017.

Project Progress will continue to be updated as the project moves forward toward the conclusion of the project. Analysis of the production data is ongoing and will be reported as the current calves are weaned and sent to the feedlot or backgrounding operation. Please contact me if there are any questions about the project animals and this report.

Conclusion

So far all work as planned in the original proposal has been conducted as scheduled. All blood tests have been successfully completed, with data stored in electronic and hard copy version for later analysis and correlation with cattle breeding data and health analysis. We have also archived all blood samples. We will be able to conduct additional blood analysis during the second year of the project. This project has supported one Ph.D. graduate student.

Florida Cattle Ehancement Board						
Project Title:	Immune Response Test for Cattle Breeding and Health Management					
Detailed Line Item Description	QTY	Unit Price	Total	Category Totals	Explanation/Justification of Deliverable	Completion Date
Domestic travel	1	$ 1,000.00	$ 1,000.00		To attend ASM 2017 conference	7/19/2017
Total Travel				**$ 1,000.00**		
Pipet Tips	1	$ 344.32	$ 344.32		Lab supply/chemicals	7/19/2017
Goat anti-bovine IgG	1	$ 256.72	$ 256.72		Lab supply/chemicals	7/19/2017
Anti-Bovine IGG (Fc)	1	$ 779.57	$ 779.57		Lab supply/chemicals	7/19/2017
Blood collection Tubes	1	$ 485.48	$ 485.48		Lab supply/chemicals	7/19/2017
Project student poster	1	$ 21.00	$ 21.00		Lab supply/chemicals	7/18/2017
Gloves	1	$ 185.60	$ 185.60		Lab supply/chemicals	7/28/2017
Total Supplies				**$ 2,072.69**		
DVM consulting (Dr. Crews)	1	$ 18,210.00	$ 18,210.00		Cattle care, vaccination, blood draw	7/19/2017
DVM consulting (Dr. Crews)	1	$ 4,552.50	$ 4,552.50		Cattle care, vaccination, blood draw	8/31/2017
Total Consulting				**$ 22,762.50**		
PI salary	1	$ 10,695.75	$ 10,695.75		Support Dr. Qun Huo's effot	8/10/2017
PI Fringe Benefits	1	$ 2,153.74	$ 2,153.74		PI fringe benefit	8/10/2017
Total PI Salary/Fringe				**$ 12,849.49**		
GRA Salary	1	$ 8,123.84	$ 8,123.84		Graduate research assistant effort	8/10/2017
Tuition (GRA)	1	$ 1,839.69	$ 1,839.69		Graduate research assistant tuition	8/10/2017
GRA Salary / Tuition				**$ 9,963.53**		
Overhead	1	$ 5,837.79	$ 5,837.79	**$5,837.79**	**Indirect cost**	**8/31/2017**
Grand total				$ 54,486.00		