

USU Extension Grant - Final Report

Project Leader - David J. Wilson

Project Title: The Use of Casein Hydrolysate as Intramammary Therapy to Cause Cessation of Lactation at the Quarter Level in Dairy Cows

Beginning Date and End Date: June 1, 2015 to May 31, 2016

Total Requested: \$10,000.00

Project Objectives: Treatment options are limited for dairy cows that have one persistently inflamed mammary quarter and three normal, healthy quarters. This project investigated a compound for cessation of milking in only one persistently inflamed quarter in cows with poor milk quality caused by that quarter. The objectives were improved milk quality and a return to milk production in the infused quarter following the next calving.

Project Results: Casein hydrolysate and placebo solutions that were used as intramammary infusions were produced at the Utah Veterinary Diagnostic Laboratory (UVDL) by JB. All dairy visits, dairy record screening and sample collection were done by JB, with periodic visits from DW and collaborator Dr. Kerry Rood to assist as needed. The herd health veterinarian at each dairy was informed about the study and attended a planning meeting before the project began.

The field trial began on June 1, 2015 and was completed March 22, 2016. Study farms were all dry lot housing operations, ranging in size from 450 animals to 2500, milking twice daily, and are a good representation of relatively large well-managed dairy operations as a whole in the western United States including Utah. Dairy Herd Improvement Association (DHIA) records including somatic cell count (SCC), daily milk production and estimated days until calving were used to screen initial candidate cows. Animals on this list were then screened for single quarter inflammation, bacterial culture result and individual quarter SCC. Total cow and mastitic quarter milk production were measured. Cows (n = 40) from 6 different commercial dairies were enrolled in the study and were assigned to one of 3 treatment groups: Casein, Placebo, or Negative Control. Enrolled cows were 38 Holsteins and 2 Jerseys. Aseptic milk samples were collected 10-21 days postpartum and tested for bacterial culture and SCC. Total cow and individual quarter milk production were tested again after calving.

Data analysis is ongoing as of May 2016. Presentations of the research objectives and study design have been made to the Animal, Dairy and Veterinary Sciences department symposium, the American Association of Veterinary Laboratory Diagnosticians conference and the National Mastitis Council conference, both national meetings with international attendance. We anticipate presentation of final results at future meetings of dairy producers, veterinarians, and allied

industry members, including at state, regional, national and possibly international conferences, and at least one refereed publication in a high quality journal as well as publication in dairy industry press. The preliminary results suggest that the 3 treatments have differences in milk production in the one mastitic quarter during the next lactation. Casein had an advantage over other treatments in involution and recovery of production in the infused mastitic quarter following the next calving. The reduction in SCC of the total cows' milk, while retaining a high percentage of total milk production from her remaining 3 lactating quarters, suggest that this is a new, minimally invasive tool to help dairy producers manage persistently inflamed quarters and contribute to dairy cow welfare as well as production. Going forward, we anticipate developing a better understanding of the mechanism of the casein hydrolysate and making modifications if needed. We have already identified some private industry interest which may provide financial support for planned future mechanistic studies. This tool can be applied directly to daily management issues faced by Utah dairy producers and assist in continuing to work towards better milk quality.

Signatures:

David J. Wilson, PI _____  _____ 5/31/16

Dept. Head, ADVS _____  _____ 6/1/16