

Promoting Dairy Cattle Health through the Transition Period and into early Lactation

By: Matthew Borchers and Jeffrey Bewley, Ph.D.

Introduction

Researchers and industry professionals alike attended the Animal Health section of the 2014 Joint Annual Meeting of the American Dairy Science Association and the American Society of Animal Science. Research relating to transition cows and ways of improving lactation health around the time of calving were presented and discussed.

Feed supplements increasing dairy heifer immune function before calving

In a University of Georgia study, the effect of a feed additive on the innate immunity of heifers was evaluated. OmniGen-AF, a nutritional supplement intended to increase immune function for dry, pre-fresh and lactating cows, was fed to dairy heifers 60 days before their expected calving dates. A treatment group consisting of 20 heifers fed OmniGen-AF was compared to a control group of the same size, not fed the additive. Blood samples were collected before supplementation (60 days prepartum), following supplementation (30 days prepartum), and on days 1, 7, 14, and 30 following calving. Blood samples were used to determine blood leukocyte concentration and activity over the study period.

Results indicated that supplement-fed heifers experienced fewer health challenges (cases of retained placenta, displaced abomasum, ketosis, udder edema, and death) than the control (1.25 vs. 1.93 cases per heifer), but no differences in mastitis prevalence, somatic cell count, or milk production were observed between groups. Supplemented heifers had lower rates of new mastitis cases when compared to the control group (9.6% vs. 23.2%, respectively). Results were indicative of the potential for OmniGen-AF to amplify leukocyte and antibacterial activity. Dietary supplementation of this product may help to support the health of transition dairy heifers. OmniGen-AF may be useful in amplifying dairy cattle immune responses, allowing them to make easier transitions into the lactating herd.

An organic-certified toxic puerperal metritis treatment's (Optimum UterFlush) effect on cure and reproductive performance of dairy cows

In a study of a certified organic treatment for toxic puerperal metritis in dairy cattle, cure rates and reproductive performance were evaluated. Optimum UterFlush (Carvacrol), a Van Beek Natural Science product, was evaluated. Dairy cattle displaying clinical symptoms of toxic puerperal metritis were assigned to one of two treatments. Clinical symptoms were described as an abnormally enlarged uterus, foul smelling and watery red-brown vaginal discharge, and a systemic illness with accompanying fever greater than 103.1° F within 12 days of calving. Clinical cases were treated using either a control of Povidone iodine diluted in 2 L of distilled water (113 cows) or Optimum UterFlush (107 cows). All cattle were also treated with hypertonic solution (500 mL of 25% calcium borogluconate IV) and oral aspirin (5 boluses/d).

Survival rates were greater for cattle treated with Optimum UterFlush vs. controls with the odds of survival being 4.7, 2.8, and 3.6 times greater at days 6, 14, and 30 after calving, respectively. An observed decrease in the occurrence of foul-smelling vaginal discharge (11% treatment vs. 28% control; $P < 0.001$), and a 2.2 times increase in pregnancy rate at first breeding were observed in the UterFlush treated group. Additionally, a decrease in breeding services per pregnancy was observed in UterFlush treated cattle with 1.96 vs. 2.58 ($P = 0.01$) services per pregnancy in the treatment and control group, respectively. No differences were observed between groups in the occurrence of fever, the odds of breeding until 150 days in milk, the time to first breeding, and the days to pregnancy.

Results indicated an increased ability to recover from toxic puerperal metritis following calving and an improved reproductive performance for cattle treated with UterFlush vs. the control. The findings

of this study indicate that treatment of toxic puerperal metritis with Optimum UterFlush may be of benefit to affected dairy cattle.

Putting a number on the cost of Hyperketonemia in early lactation dairy cattle

Researchers from Colorado State University, Cornell University, and Elanco Animal Health have developed a new model for determining the financial impact of clinical and sub-clinical ketosis (hyperketonemia) on dairy farms. Hyperketonemia cases are defined as blood concentrations of beta-Hydroxybutyric acid (BHBA) greater than or equal to 1.2 mmol/L. The developed model provides information about the effects of hyperketonemia (not just clinical ketosis) on herd profitability.

Financial losses due to Hyperketonemia's effect on future reproductive performance, production, death, culling, and related or resulting diseases were included in cost calculations for this disease. The final total cost was \$289 per case. To illustrate the impact of hyperketonemia within a 100-cow herd, an incidence rate of 32% would cause \$9,200 in losses per year. This study indicates that hyperketonemia can have a substantial impact upon farm profitability and taking appropriate actions before and following calving and quantifying blood BHBA concentrations may have a large and positive financial impact.

Competitive and unpredictable feeding environments increase inflammation and endometritis in Holstein dairy cows

In a study conducted at the University of British Columbia, transition Holstein dairy cattle were housed in a competitive and unpredictable feeding environment before calving in order to simulate the effects of group changes, overstocking, or changes in feeding schedule that may occur due to unfavorable management in the transition period. Blood samples were collected 5 weeks before calving and every week until calving to evaluate inflammation (TNF- α). Sixty-four total cattle were evaluated throughout the study, with cattle being housed in groupings of 4 treatment cattle (1-first calf heifer, 3-cows in second lactation or greater) and 4 non-treatment animals to create a competitive feeding environment. Treatment groups were rotated throughout the study to represent grouping changes, and feed delivery was randomly delayed by 0, 1, or 2 hour increments to represent variation in feed delivery times.

This environment caused increased inflammation (TNF- α ; 2.1 vs. 1.8 ± 0.06 log pg/ml; $P = 0.02$) and endometritis (64% vs. 17%; $P = 0.02$) in treatment groups vs. control groups for cows in the second lactation or greater. No differences were observed in first-calf heifers. The findings of this study suggest that a competitive and unpredictable feeding environment more greatly affected cows in the second lactation or greater than first-calf heifers.

Conclusions

The transition period in dairy cattle continues to be an area of needed improvement for the dairy community. The focus of future research will be to reduce the stress put upon dairy cattle in this delicate point in lactation. Researchers and producers alike must work closely together in the coming years to refine management strategies, improve overall animal welfare, reduce production losses, and improve farm-level profitability which are all affected by transition cow diseases.