



# Minnesota Dairy Health Conference

## SPONSORS

### GOLD



### SILVER



### COPPER



## **Preliminary Results from a Non-Inferiority Clinical Trial: Ability of Three Commercial Dry Cow Mastitis Preparations to Cure Intramammary Infections Present at Dry Off**

**A. G. Arruda, DVM<sup>1</sup>; S. Godden, DVM, DVSc<sup>1</sup>; P. Rapnicki, DVM, MBA<sup>1</sup>; P. Gorden, DVM, ABVP-Dairy<sup>2</sup>; L. Timms, PhD<sup>2</sup>; S. Aly, BVSc, MPVM, PhD<sup>3</sup>; T. Lehenbauer, DVM, MPVM, PhD<sup>3</sup>, J. Champagne, DVM, MPVM, PhD<sup>3</sup>**

<sup>1</sup>*Department of Veterinary Population Medicine, University of Minnesota, St Paul, MN*

<sup>2</sup>*Veterinary Diagnostic and Production Animal Medicine, University of Iowa, Ames, IA*

<sup>3</sup>*Department of Population Health and Reproduction, University of California, Davis, Tulare, CA*

### **Introduction:**

Dry cow therapy (DCT) is a procedure recommended by the National Mastitis Council (NMC) for mastitis control. The purpose is to cure existing subclinical intramammary infections (IMI) and prevent new infections that could be acquired during the dry period. Although DCT is widely adopted in dairy herds in North America, the efficacy of different antibiotic formulations was typically established many years ago, and studies comparing efficacy among different commercial DCT products are largely lacking. This abstract will describe the prevalence of subclinical mastitis pathogens at dry off and compare the efficacy of 3 different DCT to cure of existing IMI during the dry period.

### **Materials and Methods:**

The study included 1,091 cows (4,364 quarters) and was conducted in 6 commercial dairy farms, located in the states of MN (1), CA (2), IA (1) and WI (2). The antibiotic formulations tested were penicillin-dihydrostreptomycin (QUARMASTER®, QT, Pfizer Animal Health), ceftiofur hydrochloride (SPECTRAMAST® DC, SP, Pfizer Animal Health) and cephalixin benzathine (ToMORROW® Dry Cow, TM, Boehringer Ingelheim). Random assignment to treatment was done at the cow level. To be eligible for enrollment animals had to be visibly healthy, have 4 functional quarters and had not received any antibiotic treatment during a 30-day period prior to dry off. To be eligible for inclusion in the analysis, the cow had to have an 'on-label' dry period length of at least 30 days for SP and TM and 42 days for QT. Milk samples were aseptically collected in duplicates from each quarter immediately prior to dry off. Quarter-level milk samples were collected after calving between 0-6 days in milk (DIM) and 7-14 DIM. After being transported on ice to the laboratory, milk samples underwent culture for determination of bacterial pathogens according to NMC Guidelines. A sample was considered contaminated when 3 or more pathogens were isolated, in this case, the duplicate sample was cultured.

Data was entered into an excel database file and all analysis was conducted using SAS version 9.2. Analysis was done at the quarter level. A 'cure' was defined as lack of growth of one or two bacterial pathogens in both milk samples collected postcalving that had been isolated from the milk sample collected at dry off. Multivariate logistic regression (Proc GLIMMIX) was used to examine the relationship between treatment (explanatory variable) and risk for cure (dependent variable). Other covariates tested in the model included such items as parity, teat end score at dry off, and previous lactation milk production and linear score. Cow, herd and region were included as random effects in the model to account for clustering.

### **Results:**

Of the 4,364 quarters initially enrolled, 4,015 were eligible for inclusion in the data analysis. Common reasons for exclusion included sale or death of the cow prior to calving. Overall, 19.3% of quarters had an IMI present at dry off. There was no difference in prevalence of IMI among the three treatment groups

(QT = 18.4%, SP = 18.5%, TM = 20.8%,  $P = 0.84$ ). Overall, 95.4% of the subclinical infections at dry off were attributed to gram positive organisms, 4.0% were attributed to gram negatives and 0.8% to “others”. The most prevalent pathogen isolated in dry off samples was coagulase negative *Staphylococcus* (53.2%), followed by *Aerococcus sp* (12.8%) and environmental *Streptococcus sp* (7.5%).

A total of 775 quarters were at risk for a cure (i.e. had an IMI present at dry off), but 752 were used for this analysis mainly due to missing or contaminated samples. The overall percentage of quarters that were cured was 89.0%. There was no difference on percentage of quarters cured among the treatments (QT = 88.9%, SP = 88.1%, TM = 89.7%,  $P = 0.83$ ). No other covariates tested were associated with risk for cure between dry off and 0-14 DIM.

### **Significance:**

These preliminary findings demonstrate that the 3 DCT products tested herein have similar efficacy to cure subclinical IMI. However data analysis is ongoing to examine the effect of DCT treatment on other important outcomes such as risk for developing a new IMI during the dry period, risk for presence of an IMI at calving, and health and performance in the subsequent lactation: risk for clinical mastitis, milk production, somatic cell count, and risk for culling or death. Once completed, the results of this study will provide veterinarians and producers with much needed science-based information on the relative efficacy of commercial DCT products commonly used in North America.