

# Prevalence, Etiology and Self Cure Rates of Subclinical Intramammary Infections in Fresh Cows

A. Lago<sup>1</sup>, LV; S. Godden<sup>1</sup>, DVM, DVSc; R. Bey<sup>1</sup>, PhD; K. Leslie<sup>2</sup>, DVM, MSc; P. Ruegg<sup>3</sup>, DVM, MPVM; R. Dingwell<sup>2</sup>, DVM, DVSc

<sup>1</sup>College of Veterinary Medicine, University of Minnesota, St. Paul, MN

<sup>2</sup>Ontario Veterinary College, University of Guelph, Guelph, Ontario

<sup>3</sup>Dairy Science, University of Wisconsin, Madison, WI

## Introduction

Identifying and eliminating subclinical intramammary infections (IMI) present at the time of calving could result in milk quality, cow health and production benefits throughout the future lactation. A multi-site, multi-herd, controlled field study aims to validate the efficacy, and to quantify the cost-benefit of incorporating on-farm culture systems into both clinical and subclinical mastitis monitoring and treatment programs. The objective of this manuscript is to present preliminary results describing the prevalence, etiology and self cure rates of subclinical IMI in fresh cows and quarters.

## Materials and Methods

Fresh cows from 11 Canadian and US herds were enrolled in the first 3 days after calving. Cows were excluded from enrollment if they had fewer than 3 functional teats, signs of clinical mastitis at time of calving, or any other condition requiring treatment with systemic antibiotics. The herdsman performed the California Mastitis Test (CMT) and collected a milk sample from all four quarters using aseptic sampling techniques. The samples were frozen, and later cultured in the laboratory following methodologies recommended by the National Mastitis Council. Intramammary infection in a quarter was defined as isolation of 1 or 2 bacterial pathogen species from a quarter milk sample. A sample was considered contaminated if 3 or more bacterial species were isolated. A cow was considered infected if 1 or more quarters were infected. Bacteriological cure within a quarter was assessed by reculturing all 4 quarters at approximately 14±3 and 21±3 days after enrollment. A cure within the quarter was defined as presence of one or two organisms in the enrollment milk sample, and the absence of the same specified microorganism(s) in both the 14 and 21-day milk samples.

## Results

**Prevalence and Etiology** At this stage of the study data are available to describe culture results for a total

of 1028 cows and 4044 quarters. Seventy-two percent of all cows were infected at calving in at least one quarter. Remarkable is that the percentage of first lactation animals infected was 20% higher than that of mature cows. Thirty-seven percent of the quarters from all cows were infected. Infected cows had an average of 2 infected quarters. The pathogen most commonly isolated was coagulase-negative *Staphylococcus* spp. representing 51% of the infections, followed by *Bacillus* spp. (16%), *Streptococcus uberis* (8%), *Enterococcus* spp. (7%), *Escherichia coli* (5%), *Aerococcus* spp. (5%), *Enterobacter* spp. (2%), *Staphylococcus aureus* (2%), *Klebsiella* spp. (1%), *Yeast* (1%), *Streptococcus dysgalactiae* (<1%), *Corynebacterium bovis* (<1%), *Arcanobacterium pyogenes* (<1%), *Citrobacterium* spp. (<1%), and *Acinobacterium* spp. (<1%). The distribution of pathogens isolated was similar between heifers and mature cows. Self Cure Rates Data were analyzed from a total of 366 infected quarters with 442 bacteria. These quarters belong to cows not assigned to antibiotic intramammary treatment study groups. Overall bacteriological self cure rate (SCR) for all quarters was 54%. Self cure rates for coagulase-negative *Staphylococcus* spp. (37%) and *Staphylococcus aureus* (38%) infections were very poor. Much higher spontaneous SCR were observed for environmental streptococci (86%) and coliform infections (88%). *Bacillus* spp. infections showed an intermediate pattern, with 45% of these infections persisting until at least two to three weeks after calving. The parity of the cow did not have an association with the risk for a bacteriological cure within a quarter.

## Significance

This preliminary analysis shows that a high prevalence of subclinical IMI infections are present at 1 to 3 DIM, with half of these IMI being due to coagulase-negative *Staphylococcus* spp. It is remarkable that many of these infections are still present two to three weeks after parturition. Consequently, there is still a significant opportunity for new management tools to be implemented to further reduce IMI at calving.