

# Intramammary infection at calving following Petrifilm-based selective dry cow therapy

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## Introduction

For producers motivated to reduce the use of antimicrobials on their farms, teat sealant-based selective dry-cow therapy (SDCT) offers an alternative to blanket dry-cow therapy (BDCT). Under a SDCT program, antimicrobial dry-cow preparations (DCT) are reserved for cows that are suspected, or known, to have an intramammary infection (IMI) at dry-off. Internal teat sealants (ITS) are a non-antimicrobial treatment that have been shown to be protective against new IMI during the entire dry period. Internal teat sealants are recommended for all cows as they enter the dry period, but their role is particularly important for cows not selected to receive DCT in a SDCT program. Determination of a cow's IMI status at dry-off is essential to the success of any SDCT program. Petrifilms are culture media plates that allow producers to culture milk on-farm, with results available in 24 hours. Petrifilms had a sensitivity of 85.2% and a specificity of 73.2% when used to diagnose IMIs in low somatic cell count (SCC; < 200,000 cells/mL) cows at dry-off. The objective of this study was to compare IMI at calving between cows that received BDCT and cows selectively treated on the basis of Petrifilm culture results.

## Materials and Methods

From July 2009 through September 2010, 729 cows from 16 Canadian dairy herds with low bulk-tank SCC (<250,000 cells/mL) were enrolled in the study. To be included in the study, cows were required to have SCC < 200,000 cells/mL on the last three tests prior to dry-off, no evidence of clinical mastitis in the last 120 days of their lactation, no antibiotic treatment within the last 14 days of their lactation, and an expected dry period of  $\geq 30$  days and  $\leq 90$  days. Cows were randomly allocated to either the control group (BDCT and ITS; n = 369) or the Petrifilm culture group (SDCT (on the basis of on-farm Petrifilm culture results, cows with an IMI received DCT and ITS and cows without an IMI received ITS alone); n = 360). Quarter milk samples were collected by the producer within three to four days of calving; and a second set of quarter milk samples was collected by a technician within five to 18 days of calving. Milk

samples were cultured in a laboratory in accordance with standard National Mastitis Council (NMC) guidelines. A quarter was considered infected if  $\geq 1$  colony per 0.01 mL of inoculum (equivalent to  $\geq 100$  colony forming units (CFU)/1.0 mL of milk) of any pathogenic organism of interest was detected, except when coagulase-negative *Staphylococcus* (CNS), was cultured. For CNS, a definition of  $\geq 2$  colonies per 0.01 mL of inoculum ( $\geq 200$  cfu/mL) was used to classify quarters as infected. Quarter samples with  $\geq 3$  isolates were classified as contaminated. A quarter was classified as infected at calving if either fresh cow sample was positive for IMI.

## Results

In the Petrifilm culture group, 47.8% of cows cultured negative and were infused with an ITS as the sole treatment at dry-off. The analysis included data from 2,355 quarters from 597 cows (control group, n = 1193 quarters; Petrifilm group, 1162 quarters). Overall, CNS was the most common pathogen isolated (n = 233 quarters), followed by *Streptococcus* spp (other than *Strep. agalactiae*; 53 quarters), and *Staph. aureus* (34 quarters). The prevalence of IMI in the control group was 15.26%, compared with an IMI prevalence of 16.95% in the Petrifilm group. The odds of having an IMI at calving did not differ for quarters in the Petrifilm group, compared with quarters in the control group (OR, 1.14; 95% confidence interval, 0.82 to 1.57;  $P = 0.44$ ).

## Significance

For dairy herds able to maintain a low bulk-tank SCC, implementation of a SDCT program can reduce antimicrobial use on the farm. The Petrifilm-based SDCT program enables producers to culture milk directly on-farm, obtain results within 24 hours, and correctly identify cows with an IMI at dry-off. For cows that had an IMI (as determined via Petrifilm culture) at dry-off and were selectively treated with DCT, the risk of having an IMI at calving did not differ from that of cows that received the BDCT. Utilization of a Petrifilm-based SDCT program on low bulk-tank SCC dairy herds will promote the judicious use of antimicrobials, without any negative effects on udder health and welfare.