

sociated with increased BTM iodine concentrations; however, failure to adequately remove pre-dip products and aggressive application of post-dip was associated with increased BTM iodine concentrations. Recommendations for maintaining BTM iodine concentration within

acceptable limits should focus on maintaining proper amounts of iodine in the ration and ensuring proper application and removal of teat disinfectants prior to milking machine attachment.

Evaluation of a Petrifilm-based on-farm culture system for the detection of intramammary infections in cows with low somatic cell counts at dry-off

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Introduction

As an alternative to blanket dry-cow therapy, teat sealant-based selective dry cow therapy (SDCT) has the potential to greatly reduce the amount of antimicrobials used in dairy production. The main obstacle to SDCT is the necessity for a rapid and cost-effective method of identifying which cows have an infection at dry-off and would benefit from dry-cow antimicrobial therapy (DCT). Ideally, this method of diagnosis would be applicable to on-farm use and be simple to interpret. Because failing to treat an infected quarter at the end of lactation can have detrimental effects on the subsequent lactation, the diagnostic test should also have high sensitivity. Petrifilms are a ready-made culture media that provide results within 24 hours and are suitable for on-farm use. The presence of an indicator dye in the Petrifilm medium makes aerobic bacterial colonies appear as bright pink dots against a white background. Petrifilms have been validated as a diagnostic tool for the selective treatment of mastitis in lactating cows. The objective of this study was to determine the utility of a Petrifilm-based on-farm culture system for making treatment decisions for cows with low somatic cell counts (SCC) at dry-off.

Materials and Methods

Cows from 16 dairy herds that had low bulk-tank SCCs (<250,000 cells/ml) located in Quebec and Prince Edward Island were considered for inclusion in the study. Inclusion criteria included SCC < 200,000 cells/mL on the last three tests prior to dry-off, no evidence of clinical mastitis in the last 120 days prior to dry-off, no antimicrobial treatment within the last 14 days prior to dry-off, and an expected dry period of 30 to 90 days. On the day prior to dry-off, quarter and composite milk samples were collected. Quarter samples were cultured in a reference laboratory and composite samples were assessed using the Petrifilm-based on-farm culture system. On the scheduled day of dry-off, the Petrifilm was read by the producer and, in accordance with study protocol, cows were classified as positive if ≥ 5 colonies were present. Cows with negative Petrifilm results were treated with an internal teat sealant (ITS) alone at dry-off; cows with positive Petrifilm results were treated with DCT and an ITS. To assess the ability of producers to correctly classify cows into DCT and no DCT groups, the agreement between Petrifilm results obtained by the producer and those obtained by an au-

tomated reader was assessed by a kappa statistic. The test characteristics of the Petrifilm test system were calculated by comparing the producer-derived Petrifilm results to those obtained by standard laboratory culture.

Results

Of the 360 cows evaluated, 16 were excluded from the analyses because of contamination of the milk sample. One additional cow was removed due to incomplete records, resulting in data from 343 cows for analyses. When read by the producer, 47.8% of the cows yielded negative results on the Petrifilm culture and received an ITS as a sole treatment. The overall sensitivity and specificity of the Petrifilm-based on-farm culture system was 85.2% (95% confidence interval, 78.5 to 90.5) and 73.2% (95% confidence interval, 66.4 to 79.3), respectively. The negative predictive value of the Petrifilm test system was high (86.6%) when estimated using the

prevalence of intramammary infection in this data set, and the positive predictive value was moderate (70.9%). A total of 279 Petrifilms were available for evaluation by the automated reader. The level of agreement between the producer and automated reader was high, with a kappa value of 0.82 (95% confidence interval, 0.75 to 0.89).

Significance

The interpretation of the Petrifilm culture system is straightforward, as demonstrated by the ability of producers to correctly classify cows into treatment and no-treatment categories, and the high level of agreement between the producers and the automated reader. Additionally, the Petrifilm culture system had a high sensitivity when interpreted by the producer, indicating that few infected cows would be missed.