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SOMATIC CELL COUNT IN THE FIRST SIX MILKINGS AFTER CALVING

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Thirty cows in 6 herds were studied during the first 6 milkings after calving. Quarter foremilk samples were collected by the farmers at calving and at 6 subsequent milkings. Geometric mean SCC decreased from 593,000 at calving to 126,000 cells/ml at the 6th milking after calving. Geometric mean SCC was 3,344,000 cells/ml at calving and 1,808,000 cells/ml at sixth milking after calving in quarters where at calving and the fourth milking after calving the same major pathogenic bacteria was found. In quarters culture-negative both at calving and the fourth milking after calving, SCC decreased from 384,000 at calving to 61,000 cells/ml at the sixth milking after calving. It can be concluded that SCC can be used early postpartum to give an indication of IMI status.

INTRODUCTION

Since SCC of dairy cows is frequently elevated shortly after calving, use of SCC during this period is not recommended. However, no longitudinal data about SCC in culture-negative quarters in the first days after calving are available. Because the rate of infection is high in this period, SCC could be of considerable use to detect cows with IMI. However, this would only be true when physiologically normal SCC concentrations are low in culture-negative quarters. The purpose of this study was to longitudinally study SCC after calving in culture-negative and culture-positive udder quarters.

MATERIALS AND METHODS

Thirty cows in 6 herds were studied during the first 6 milkings after calving (**M1-M6**). The cows were milked twice daily. Quarter foremilk samples were collected by the farmers at calving and at 6 subsequent milkings. Geometric average bulk milk SCC during the study period was 210,000 cells/ml. Samples were split and SCC was determined by a Fossomatic counter (Foss Electric, Hillerød, Denmark) within 16 h after collection. No preservative was used. The remainder of the milk sample was stored at -20°C for a maximum of three weeks. After freezing milk samples taken at calving and at M4 were thawed at room temperature for bacteriological analysis. Culture-negative was defined as culture-negative at both calving and M4. Culture-positive was defined as culture-positive at both calving and M4. Other was defined as culture-positive at one sampling and culture-negative at the other. Data were analysed using a linear mixed model procedure with quarter within cow as the unit of analysis and a AR(1) covariance structure (SAS PROC MIXED). The number of sampling after calving was used to indicate the repeated measurement. Herd, and cow within herd (whole plot error) were entered as random variable.

RESULTS AND DISCUSSION

At calving 70 (58%) of the 120 quarters were culture-negative. At M4 this was increased to 79 (66%) quarters. Bacteriologically, 26 of 50 quarters (52%) that were infected at calving cured spontaneously. In 17 of 70 quarters (24%) that were culture-negative at calving, a new IMI was diagnosed at M4. Coagulase-negative staphylococci were most frequently isolated from quarter milk samples, both at calving and M4. Of the major pathogens, *S. aureus* and *Str. agalactiae* were most frequently isolated. Geometric mean SCC decreased from 593,000 at calving to 126,000 cells/ml at M6. In quarters where at calving and M4 the same major pathogenic bacteria was found, geometric mean SCC was 3,344,000 cells/ml at calving and 1,808,000 cells/ml at M6. In quarters culture-negative both at calving and M4, SCC decreased from 384,000 at calving to 61,000 cells/ml at M6. Ninety-six percent of culture-negative samples had SCC <500,000 cells/ml at M6, vs. only 17% of samples with major pathogens. This would indicate that the California Mastitis Test, a cow-side test with high sensitivity (94%) at a cut-off value of 500,000 cells/ml may be used to select quarters for bacteriological culturing. In the final generalized linear repeated measurement model, as expected, autocorrelation between Ln SCC in subsequent milkings was high. In quarters from which major pathogens were cultured, Ln SCC was 1.399 units higher than in milk from culture-negative quarters. The interaction term MAJPATHxMILKING was significant. This indicates that Ln SCC decreased less in quarters infected with major pathogens, in the first six milkings after milking, than in culture-negative quarters. Decrease of Ln SCC of quarters infected with major pathogens was 0.300-0.203=0.097 units per milking.In culture-negative quarters, Ln SCC decreased during the first 6 milkings after calving at a rate of 0.300 units per milking. Bias in predicting IMI based on SCC <250,000 cells/ml was found to decrease rapidly in the first days after calving. We conclude therefore that use of SCC data on milk collected from the second day after calving is possible.

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