and tended to be higher during the early postpartum period ($P \leq 0.10$).

In conclusion, a monensin controlled-release capsule inserted at dry off did not significantly affect NEFA and BHB, but did slightly increase blood glucose concentrations in Holstein transition cows fed diets containing citrus pulp.

Significance

Although monensin is not allowed in lactating dairy cows in the United States, results of the present study offer valid information for use in dairy cattle under sub-tropical conditions, if monensin is approved for future use in lactating dairy animals.

Comparison of J-5 Vaccinates and Controls for Clinical Severity, Milk Production Change, Etiologic Agent, and Survival in the Herd Following Naturally Occurring Cases of Clinical Mastitis

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Introduction

Naturally occurring cases of clinical mastitis (CM) were studied among J-5 vaccinates or controls on three commercial dairy farms. Measures of clinical severity, milk production change and survival in the herd were evaluated for differences between the two groups. Particularly the study looked at protection against being culled with mastitis as the primary reason, including time-to-event analysis.

Materials and Methods

Cows having completed at least one previous lactation were eligible for inclusion in the study, conducted on three commercial dairy farms over 20 months. Cows were excluded if during the last three months of the previous lactation they had a somatic cell count (SCC) >1,000,000/ml, or if at time of drying off they had any teat ends that scored as poor using a visual scoring system, or had any clinical signs of mastitis. Cows were randomly allocated as J-5 bacterin vaccinates or controls. Vaccine was administered by investigators subcutaneously in the supramammary region just before cows were dry, and again four weeks later, during the mid-dry period.

Evaluation of computerized daily milk weight recording on both study farms showed that 97% of all cows' milk weights were recorded correctly in the computer data. Some cows had multiple CM episodes in the same quarter. Any such episode that occurred within five days of end of treatment (or end of milk withholding) was considered a chronic case of mastitis. Any episode that occurred from six to 14 days after recovery from the earlier episode was considered chronic if the same etiologic agent was isolated from both episodes. If a different mastitis pathogen was isolated or the episode occurred more than 14 days after recovery, it constituted a new CM case. All new cases of CM occurring during the first 200 days in milk (DIM) were included.

Training and standardization for CM detection, use of a cowside scale for clinical severity, and aseptic sample collection was provided to milking personnel at the beginning of the study. Farm personnel collected aseptic samples for microbiological culture from quarters with signs of CM. National Mastitis Council laboratory procedures for diagnosis of bovine intramammary infections were followed.

Lactation number, daily milk production throughout lactation, DIM at onset of clinical mastitis, quarters infected, all pathogens isolated, clinical severity, mean milk production for the 14 days before onset of CM, mean production for the 21 days following onset of CM, reproductive events, and survival days until dry, sold, or died were collected for all cows.

Statistical analyses including chi-square, ANOVA, linear modeling and survival analysis methods were performed using SAS 8.2.

Results

Study population was 745 cows; 371 vaccinates and 374 controls. There were 170 episodes of CM contracted by 119 study cows from November 15, 1999 to July 31, 2001. Some episodes of mastitis were caused by more than one pathogen, and/or affected more than one quarter. These additional pathogens or quarters accounted for a total of 230 cases of CM among the 170 onset days, 111 cases in controls and 119 in vaccinates.

Mastitis agents isolated from 230 cases were: no pathogen isolated 27 (11.7%), *Escherichia coli* 44 (19.1%), *Klebsiella* 21 (9.1%), non-agalactiae streptococci 54 (23.5%), *Staphylococcus aureus* 17 (7.4%), coagulase-negative staphylococci 13 (5.7%), *Actinobacillus pyogenes* 11 (4.8%), *Enterobacter* 3 (1.3%), yeast 3 (1.3%), gram-positive bacilli 2 (0.9%), fungi 1 (0.5%), mixed major pathogens 13 (5.7%), no culture sample collected 21 (9.1%).

Coliform (*E. coli, Klebsiella, and Enterobacter*) CM cases were more likely to be judged as clinically severe at time of onset than CM caused by other agents. J-5 vaccinates contracted fewer CM cases caused by coliforms or with no pathogen isolated in the first 30 DIM than controls. Vaccinates were less likely to be culled with mastitis as the primary reason for the first 150 days following CM, and when cases were followed until one of three terminal events: 305 DIM, sold or died.

Conclusion

J-5 vaccination did not appear to reduce clinical severity among coliform cases, only to make them less likely to be contracted in early lactation. It was protective against culling for mastitis for all vaccinates, regardless of etiology of CM. J-5 did reduce milk production loss among non-coliform cases of mastitis, while it did not have this benefit for coliform cases.

Further analyses will be reported.

Significance

J-5 vaccination was associated with significant survival advantages (protection against culling) regardless of etiology of CM. Milk production loss was reduced only among non-coliform cases, suggesting that J-5 may be cross-protective against CM caused by pathogens other than coliforms. Vaccine protection decreased as lactation (and time since vaccination) progressed, suggesting that J-5 may produce a memory-type immune response that wanes with time. Further investigation of the mechanisms of action of J-5 bacterin are needed. Practical implications of possible need for change in J-5 vaccination schedules will be discussed.