Effect of a Monensin Slow-release Capsule at Dry-off on Ketolactia and Milk Yield in Holstein Cows

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Introduction

This study evaluated the effect of a monensin slow-release capsule (Rumensin®) given at dry-off on levels of b-hydroxy butyrate in milk at 14 days post-partum and daily milk yield up to 20 days post-partum on Holstein dairy cows.

Materials and Methods

The study was conducted in a 3000-Holstein commercial Florida dairy farm with a milk rolling herd average of 23,100 lb (10,500 kg). Most cows were housed in a dry-lot system, fed a total mixed ration and milked three times a day. At 21 days prepartum, dry cows were moved to a transition lot receiving a diet with a dietary cation anion difference (DCAD) of 80 mEq/kg dry matter. At calving, cows were moved to a fresh lot up to 21 days post partum. Between July and August 2001, 300 cows dried-off between 50 to 70 days before expected parturition were randomly assigned to either a treatment or control group. The treated group (n=150) received an oral capsule of monensin (releasing 300 mg of monensin daily for 95 days). Control cows (no capsule) were randomly matched by parity. The outcome variables were daily milk production within 20 days post partum and the levels of b-hydroxy butyrate in milk as indicator of subclinical ketosis. Milk production was recorded daily by the software AfiFarm (S.A.E. Afikimâ, Israel). The concentrations of b-hydroxy butyrate were tested using a colorimetric semi-quantitative commercial kit (Ketolac BHB®, Nagoya, Japan) in a composite milk sample obtained at days 14 post-partum during the second milking of the day. Positive cows were defined by a reading ≥ 200 micromol/L of b-hydroxy butyrate. Milk yields were analyzed by repeated measure ANOVA developing a mixed model. The model considered effect of day, treatment, parity and the interaction treatment "parity" day. Proportion of cows with subclinical ketosis was analyzed by logistic regression correcting by parity, milk yield at days 14 post partum and body condition score (BSC) at calving. Odds ratios and 95% confidence interval were reported.

Results

Only 280 cows were tested for b-hydroxy butyrate, and 273 cows were considered for the analysis of milk yield. For subclinical ketosis, the adjusted effect of treatment was that cows receiving monensin were 0.49 times less likely to develop subclinical ketosis (OR 95% CI =0.27-0.89) than control cows. BCS tended to be a predictor of subclinical ketosis. Milk yield and parity were not predictors of subclinical ketosis. For milk yield, only day and the interaction treatment "parity" day were significant variables in the model. Within parity 1, treated cows tended to produce more milk at days 6, 7 and 12 than control cows (p ≤ 0.15). Within parity 2, treated cows produced more milk at day 3 (p ≤0.05) than control cows and tended to produce more milk at days 4, 15, 19 and 20 (p ≤ 0.1) than normal cows. Within parity 3, treated cows produced less milk at days 4, 5, 10 and 16 (p ≤ 0.05) than control cows.

Conclusion

It is concluded that monensin decreased the proportion of cows developing subclinical ketosis and affected milk production on certain days up to 20 days postpartum.