Effects of postpartum oral calcium supplementation on productive and reproductive outcomes in multiparous Jersey cows

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Introduction

The detrimental effects that subclinical hypocalcemia has on postpartum performance, and the lack of a cow-side diagnostic tool, drives researchers to focus on designing preventive management strategies. The objectives of this study were to evaluate the effect of prophylactic supplementation with oral calcium boluses after calving on productive and reproductive outcomes.

Materials and Methods

After calving, cows were systematically assigned to control (no oral Ca supplementation; n=553) or oral Ca supplementation (CaOS; 50 to 60 g of Ca as boluses; QuadricalMINI, Bio-Vet Inc., Barneveld, WI; n=542) at 0 and 1 DIM. Monthly milk data (1st, 2nd and 3rd test) from Dairy Herd Improvement Association (DHIA) were evaluated using linear regression with the MIXED procedure. The GLIMMIX and PHREG procedures of SAS were used to evaluate first service conception was analyzed by logistic regression with procedure and risk of pregnancy at 150 DIM of SAS. Herd was included in the models as a random effect. Variables considered for inclusion in the final model were: lactation number, previous lactation days open, previous lactation 305-d milk yield (Pr305ME) and length, gestation length, dry and close-up periods length, body condition and locomotion scores at calving, calving easiness, calf gender, DIM and month at 1st DHIA test, DIM and month at 1st AI and breeding code (timed AI or heat breeding).

Results

For the 1st DHIA test, CaOS cows with a dry period length greater than the 75th percentile (>Q3; >58 d Herd 1, >90 d Herd 2) produced 5.07 lb (2.30 kg) of milk more than control cows. In addition, when the test occurred during the 4th week after calving, CaOS cows produced 4.32 lb (1.96 kg) of milk more than control cows. Also, at 1st milk test CaOS cows that ranked at >105% of herd mean for Pr305ME had lower milk fat% compared to control cows (4.6 vs 4.9%, respectively). Based on the first 3 monthly DHIA tests, CaOS with a previous lactation or dry period length >Q3 of the herd (>334 d Herd 1, >355 d Herd 2) produced 3.3 and 4.0 lb (1.5 and 1.8 kg) of milk more than control cows. Conception at 1st service was 9% lower for CaOS with a previous gestation length longer than the herd median (>279 d Herd 1, >281 d Herd 2). No significant effects involving treatment were observed for 1st DHIA milk test %Protein and SCC nor for risk of pregnancy at 150 DIM.

Significance

Our results suggest that the response to postpartum oral Ca supplementation may vary according to different peripartum factors. After postpartum supplementation, there was a response on milk yield and milk components that varied based on cows' dry period length, previous gestation length, and previous lactation yield and length. Cows with longer dry periods and previous lactation benefitted the most from treatment.