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Effects of two rumen-protected choline sources during transition period on Holstein dairy cows performance

The objective of this study was to evaluate the effect of two sources of rumen-protected choline (RPC) supplemented from 21 d pre- to 35 d postpartum. Twenty-four multiparous Holstein dairy cows (248 ± 4.9 days carrying calf, 3.6 ± 2 parity, 2.7 ± 0.3 BCS) were enrolled in a completely randomized design. A corn-silage based total mixed ration (TMR) was formulated to provide 2.38 (pre-) and 2.19 (postpartum) Met of % MP. Cows were assigned to 1 of 3 groups ($n = 8/\text{group}$): unsupplemented TMR (CTR), TMR supplemented with 60 g/d of RPC (RPC1; lipid-microencapsulated choline chloride [CC] 25%; Ruprocol[®], Vetagro S.p.A., Italy) and TMR supplemented with 25 g/d of RPC (RPC2; lipid-encapsulated CC 60%; Reashure[®] XC, Balchem Corp., USA). Both supplements were applied once per day as top-dress on TMR and equally provided 15 g/d of CC. Cows were fed once and milked twice daily. Milk yield, milk components, and postpartum dry matter intake (DMI) and body weight (BW) were recorded daily. Data were analyzed under a mixed model with the random effect of cow and the fixed effects of parity and days in milk (DIM), treatment and their interaction. Due to a significant interaction treatment \times DIM ($P < 0.05$) in all dependent variables, data were analyzed separately in 3 time periods: 0 to 10 (1), 11 to 21 (2) and 22 to 35 (3) DIM. No clinical health disorders were recorded. No differences were detected for DMI, BW and milk protein between treatments. RPC1 increased yields of energy-corrected milk (ECM) and 3.5% fat-corrected milk (FCM) compared to RPC2 and CTR during period 1 ($P < 0.10$) and period 2 ($P = 0.05$). This is probably explained because milk fat yield was higher for RPC1 relative to the other groups, mainly in period 2 ($P = 0.04$). Although milk fat yield tended to be higher in period 3 ($P = 0.12$) for RPC1, no differences were detected regarding ECM and FCM. RPC1 also tended to increase milk yield ($P = 0.07$) and milk efficiency ($P = 0.11$) in period 2 compared to CTR and RPC2. These preliminary results would suggest a greater RPC effect on lactation performance within the first 21 days postpartum, with a more pronounced response for RPC1.

choline, transition, production