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Defining the value of prepartum propylene glycol administration in transition dairy cows

Ketosis is a metabolic disease commonly found in dairy cattle within the transition period, from 21 days prior to calving (prepartum) through 21 days postpartum. When used prepartum, propylene glycol may have the ability to prevent ketosis and improve energy metabolism. A group of 27 Holstein dairy cows/heifers were blocked by lactation number and body condition score and randomly assigned to one of 3 treatments (TRT) to evaluate the effects of prepartum and/or postpartum drench of propylene glycol as an effective management strategy in preventing ketosis. The control group (TRT C), received 50 mL of water everyday throughout the transition period. Cows assigned to TRT A were dosed with 100 mL of propylene glycol per day only during the prepartum period. In the postpartum period TRT A received 50 mL of water per day. Treatment B was given 100 mL propylene glycol everyday throughout the entire transition period. Data collection encompassed a total of 42 days. Biweekly measurements were taken for body weight, body condition score, urine pH and ketones. Blood plasma was collected biweekly to analyze NEFA, ketone, and glucose levels. Milk weights were monitored daily with weekly samples taken to measure milk urea nitrogen, somatic cell, fat, and protein content. Data were analyzed as a repeated measurement using PROC MIXED procedures in SAS. The main plot contained effect of TRT and the subplot contained the effect of TRT x Time. There was no effect of TRT or TRT x Time on UK across all lactations. There was no effect of TRT or TRT x Time on NEFA levels in the first and third+ lactation cows. However, there was an effect of TRT and TRT x Time on NEFA levels in the second lactation group (TRT $p=0.1$, TRT x Time $p=0.02$) with NEFA LS means for TRT A, B, and C being 494, 355, and 353 $\mu\text{M/L}$ respectively. Propylene glycol failed to beneficially alter energy metabolism as previously indicated.