

## Postpartum health is associated with detection of estrus by activity monitors in dairy cows

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Over 80% of Canadian dairies use some estrus detection in reproductive management. Being able to identify cows more or less likely to be detected in estrus based on their health status would optimize reproductive management and performance. Our objective was to investigate associations of postpartum health with detection of estrus by activity monitors. In Holstein cows (n = 1,210) from 2 commercial herds in Ontario, serum concentrations of total Ca, haptoglobin, and NEFA were measured at 2 and 6 ( $\pm 1$ ) DIM, and blood BHB and metritis (with Metrichex) were assessed at 4, 8, 11, and 15 ( $\pm 1$ ) DIM. Purulent vaginal discharge (PVD) and endometritis (based on endometrial cytology sampled by cytobrush) were examined at week 5. Body condition score (BCS) and lameness were assessed throughout the study, and additional disease data obtained from farm records. Serum progesterone was measured biweekly from week 3 to 9. First AI was primarily based on estrus detection by activity monitors (Afimilk or SCR Engineers Ltd.) without synchronization between 50 and 75 DIM. Continuous variables were categorized with ROC analysis associated with estrus detection, and data analyzed using multivariable mixed logistic regression models. Estrus detection occurred in 71% of cows. Compared to cows without each of these risk factors, estrus detection was less likely in cows with retained placenta (61 vs. 73%), haptoglobin  $\geq 0.47$  g/L at 6 DIM (69 vs. 75%), BHB  $\geq 0.7$  mM in 2 or more samples (69 vs. 79%), PVD (66 vs. 73%), endometritis ( $\geq 2\%$  polymorphonuclear cells; 67 vs. 76%),  $\geq 0.5$ -point BCS loss by week 9 (67 vs. 80%), or in cows anovular by 49 DIM (61 vs. 74%).

**Take home message:** Based on postpartum health variables, farmers could identify cows that are more or less likely to be detected in estrus, allowing selective use of synchronization and optimized performance using activity monitors as a primary tool for reproductive management.

## Effect of transition diet starch content, parity, and milking number on total sialic acids in the protein and carbohydrate fractions of colostrum and transition milk of Holstein dairy cattle

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Colostrum and milk sialic acids (SA) are beneficial compounds that can promote immunity and gut development in neonates; yet strategies to maximize the amount of SA produced by the dam are unknown. To determine how close-up diet starch content affects colostrum SA levels and how both close-up and fresh diet starch content affects the SA profile of transition milk (TM; milkings (M) 2-6), multiparous (MP; n = 51) and primiparous (PP; n = 36) Holstein cows were assigned to a close-up diet containing moderate (CON; 14.0% starch, %DM) or high (HI; 26.1% starch, %DM) starch from 28 d prior to expected calving date, and to a high fibre (HF; 33.8% NDF, 25.1% starch, %DM) or high starch (HS; 27.2% NDF, 32.8% starch, %DM) diet after calving. In the carbohydrate and protein fraction of colostrum, total SA yields were  $25.4 \pm 1.90$  and  $2.2 \pm 0.22$  g, respectively, and protein total SA yield was positively correlated with IgG yield ( $r = 0.76$ ;  $P < 0.0001$ ). Carbohydrate and protein total SA concentrations decreased ( $P < 0.0001$ ) by 34 and 90%, respectively, from colostrum to M6. MP cows produced 1.6 and 2.5x greater ( $P < 0.0003$ ) SA yield in the carbohydrate and protein fraction, respectively, from M1-6 compared to PP cows. Transition diet had no effect ( $P = 0.98$ ) on carbohydrate SA; however, feeding CON tended ( $P = 0.06$ ) to increase protein total SA concentration from M1-6 by 25% compared to feeding HI.

**Take Home Message:** Moderate starch inclusion during close-up can improve concentrations of protein SA in colostrum and TM and may be a feasible strategy to increase the amount of SA consumed by the calf to promote optimal development in early life.