

How does Low Blood Calcium close to Calving Relate to Health, Production and Reproduction in Dairy Cows?

M. Gobikrushanth³, K. Macmillan² and M.G. Colazo¹

¹Alberta Agriculture and Forestry; ²University of Alberta; ³University of Saskatchewan; E-mail: marcos.colazo@gov.ab.ca

Blood samples were taken between 2 and 7 days in milk (DIM) in 398 Holstein cows from 11 dairy herds in Alberta. Blood serum was analyzed for macro minerals, including calcium (Ca), metabolites, liver enzymes, hormones and haptoglobin. Cows were categorized into either Low- (≤ 2.10 mmol/L; n = 136) or High- (> 2.10 mmol/L; n = 262) Ca groups. Cow health was monitored daily and diseases were diagnosed by farm staff or blood information. Production measurements included milk yield at 25 and 90 DIM, as well as 305-day mature equivalent milk yield. Reproduction outcomes were cyclicity by 35 DIM, pregnancy to first AI and pregnancy by 150 DIM. Low-Ca cows had lower concentrations of Mg, Na, K, albumin, globulin, total protein and cholesterol, and greater concentrations of urea, aspartate aminotransferase, β -hydroxybutyrate, non-esterified fatty acids and haptoglobin than High-Ca cows. Low-Ca cows had greater incidence of retained fetal membranes (18 vs. 4%), metritis (33 vs. 11%) and ketosis (27 vs. 9%) compared with High-Ca cows. In addition, culling (11 vs. 2%) and death rate (6 vs. 3%) were greater for Low-Ca cows. Low-Ca cows had lower milk yield only by 25 DIM compared with High-Ca cows (714 vs. 794 kg). The proportion of cows cyclic at 35 DIM (56 vs. 67%) and pregnant to first AI (31 vs. 43%) tended to be lesser for Low-Ca cows compared with High-Ca cows, with no difference in the proportion of cows pregnant by 150 DIM (66 vs. 68%). **Take Home Message:** Cows categorized as Low-Ca had lower serum concentrations of macro minerals, greater concentrations of markers for fat mobilization and inflammation, greater incidence of postpartum diseases and poorer reproductive outcomes compared with those categorized as High-Ca. Ensuring adequate blood Ca concentrations and dry matter intake after calving is essential for a smooth transition period. Thank you to *Growing Forward 2* (a federal-provincial-territorial initiative) and Alberta Agriculture and Forestry for financial support, and to the participating dairy producers, veterinarians and Mr. Jeromy Ten Hag (CanWest DHI).