Association among body condition score change, milk yield, and reproductive performance of Holstein cows

Chebel, R. C., P. J. Pinedo, J.E.P. Santos, G. M. Schuenemann, G.J. M. Rosa, R. Gilbert, R. C. Bicalho, K. N. Galvão, C. Seabury, J. Fetrow, W. W. Thatcher, and S. L. Rodriguez-Zas.
2015. J. Dairy Sci. 98:115 (Abstr.).

Associations among body condition score change from calving to 35 days in milk (DIM), resumption of cyclicity by 50 DIM, and both productive and reproductive performance were analyzed. Holstein cows (n = 5,175) from 9 dairy herds from the Southwest, Southeast and Midwest of the U.S. were used in this preliminary update of the grant. Cows had BCS assessed at 3 ± 3 and 35 ± 3 DIM. Cows were classified according to BCS change [gained (G), no change (NC), moderate loss (ML) = −0.25 to −0.75, and extreme loss (EL) < −0.75]. Study personnel examined cows for retained placenta and metritis. Blood sampled at 7 DIM was used to diagnose ketosis (BHB >1.0 mmol/L). Calf gender, occurrences of calving problems (i.e., twins, stillbirth, and dystocia), mastitis, displacement of abomasum, and respiratory illness during the 60 DIM were recorded. Cows were milked thrice daily and average milk yield during the first 90 DIM was recorded. Continuous data were analyzed by ANOVA, dichotomous data were analyzed by logistic regression, and pregnancy hazard ratio was analyzed by Cox Proportional Hazard Ratio. The interaction between BCS at 3 DIM and BCS change was associated with milk yield ($P < 0.01$). Among cows calving with BCS <3.25, milk yield was lowest for cows gaining BCS and cows with extreme BCS loss from 3 to 35 DIM (G = 34.4 ± 0.3, NC = 37.1 ± 0.3, ML = 38.2 ± 0.3, and XL = 34.4 ± 4.4 kg/day). Among cows calving with BCS = 3.25 to 3.5 (G = 35.4 ± 0.5, NC = 36.3 ± 0.3, ML = 37.9 ± 0.2, and XL = 39.1 ± 1.0 kg/day) and cows calving with BCS >3.5 (G = 26.0 ± 2.3, NC = 35.0 ± 1.0, ML = 37.5 ± 0.4, and XL = 38.5 ± 0.9kg/d), milk yield was greatest when cows had extreme BCS loss from 3 to 35 DIM. Change in BCS from 3 to 35 DIM was associated ($P < 0.01$) with likelihood of cows resuming cyclicity by 50 DIM (G = 78.8%, NC = 76.4%, ML = 74.8%, and XL = 75.9%). Although BCS change was not associated with the probability of pregnancy after first postpartum AI, pregnancy hazard ratio was associated with BCS change from 3 to 35 DIM [G = 1.2 (95% CI for HR: 0.99, 1.56), NC = 1.21 (0.98, 1.51), ML = 1.10 (0.90, 1.36), and EL = referent]. In conclusion, excessive loss of BCS from 3 to 35 DIM was associated with greater milk yield and reduced cyclicity and reproductive performance.