Dairy Research Summary

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Postpartum Body Condition Score Change and Performance in Western Canadian Dairy Cows

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Why is this important?

Body condition score (BCS) is a management tool to assess body fat stores and in early lactation BCS change is an indirect measurement of fat mobilization and energy balance. Cows often enter a period of negative energy balance after parturition due to decreased dry matter intake (DMI) soon before and after calving that lags behind the rapidly increasing energy demand for lactation. Cows with greater genetic merit for milk production experience greater negative energy balance and thus experience greater fat mobilization and BCS loss in early lactation. As cows have been selected for increased milk production, there has also been a decrease in reproductive efficiency. Energy balance during the first 28 d postpartum is a primary trait associated with fertility; therefore, BCS change in early lactation may be an indicator of reproductive performance. The objectives of this study were to (1) identify factors associated with postpartum BCS maintenance/gain, (2) determine the optimum pre-calving BCS, and (3) evaluate the relationship between postpartum BCS change and productive and reproductive performance in Western Canadian dairy cows.

What did we do?

In total, 911 lactating dairy cows from 11 herds in Alberta were included in the study between April to November 2015. The BCS was measured pre-calving (2 to 14 days before calving) and post-calving (35 days after calving) using a 5 point scale with 0.25 increments, with 1 being thin and 5 being fat. Cows were categorized based on BCS change between pre- and post-calving measurements as follows: extreme loss (EL) ≥ -0.75, moderate loss (ML) -0.25 to -0.50, maintained (M) 0, or gained (G) ≥ 0.25 points. For each cow, incidence of postpartum disorders, productive (lactation length, milk yield at 25 and 90 days in milk (DIM), peak and 305-d mature-equivalent milk yields) and reproductive performance (ovarian cyclicity status by 35 DIM, pregnancy to first AI, pregnancy by 150 DIM and pregnancy loss after first AI) were determined.

Table 1. Mean BCS at pre-calving and 35 d post-calving, and BCS change in cows by postpartum BCS change category

	BCS change categories[1]			
	EL	ML	M	G
Number of cows, %	343 (37.7%)	391 (42.9%)	103 (11.3%)	74 (8.1%)
Pre-calving BCS	3.6[a]	3.4[b]	3.2[c]	2.9[d]
Post-calving BCS	2.7[a]	3.0[b]	3.2[c]	3.2[c]
BCS change	-0.9	-0.4	0.0	0.3

[1]EL=extreme loss, ML=moderate loss, M=maintained, G=gained BCS
a-d within a row, values without common letters were significantly different ($P < 0.05$).

What did we find?

The optimum pre-calving BCS predictive of postpartum BCS maintenance/gain was 3.25 for primiparous cows and 3.00 for multiparous cows. Pre-calving BCS and post-partum disease were factors associated with BCS maintenance/gain and calving with a lower BCS and no disease occurrence in early lactation increased the probability for BCS maintenance/gain. Milk yield at 25 and 90 DIM did not differ among BCS change categories; however, peak (44 vs. 42 kg) and 305-d mature equivalent (10,962 vs. 10,259 kg) milk yields were greater for EL compared to G category cows.

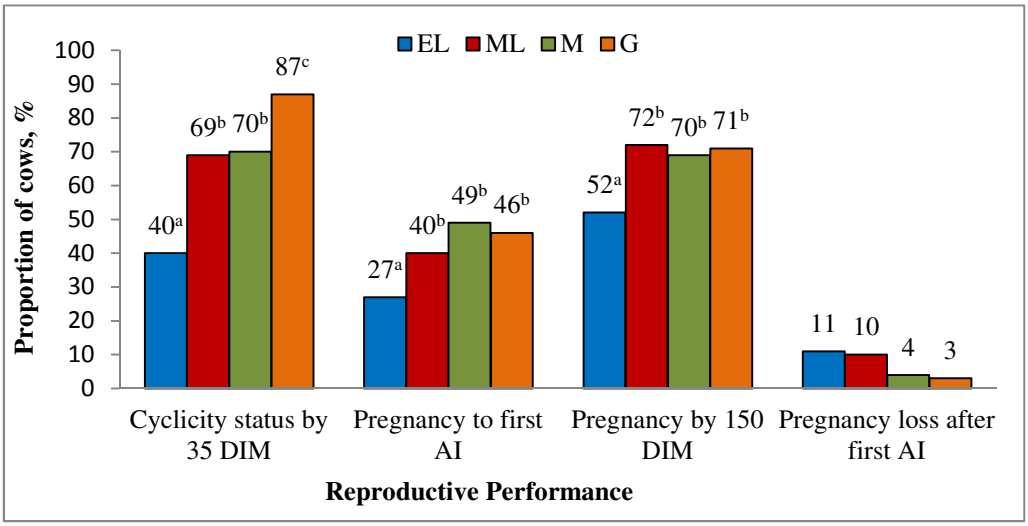

Figure 1. The associations between postpartum BCS change categories and reproductive outcomes. Cows were categorized based on BCS change as extreme loss (EL), moderate loss (ML), maintained (M) or gained (G).
a-c within a reproductive measure, values without common letters were significantly different ($P < 0.05$).

What does this mean?

Extreme loss of BCS after calving resulted in increased peak and 305-d mature equivalent milk yield compared to cows that gained BCS. However, extreme loss of BCS was also associated with reduced cyclicity by 35 DIM and decreased pregnancy rates at the 1st AI and by 150 DIM. Ensuring maintenance or only a moderate loss of BCS (-0.50 to -0.25) in early lactation can improve fertility without reducing milk production. Pre-calving BCS was the most important factor associated with BCS loss postpartum and the ideal pre-calving BCS was 3.25 for primiparous cows and 3.00 for multiparous cows. In the farms studied, 81 % of cows lost BCS and only 19 % maintain/gained BCS in the first 35 days after calving. It is important to monitor BCS over the dry period and prevent over conditioning before calving.

Summary Points

- Cows with extreme loss of BCS (≥ -0.75 points) between pre-calving and 35 days post-calving had greater milk yield but reduced fertility
- Pre-calving BCS was the main factor associated with BCS; the optimum calving BCS is 3.00 to 3.25
- Ensuring BCS maintenance, or only moderate loss, post-calving will improve fertility without sacrificing milk yield

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