Associations Amongst Dairy Cow Body Condition Score, Body Weight And Serum Biochemistry

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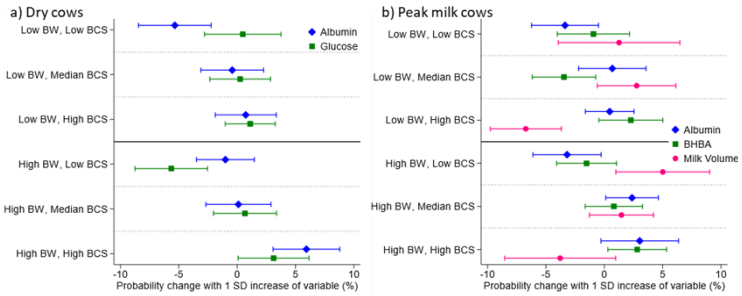
Body of the Abstract

Introduction: Body condition score (BCS) and body weight (BW) yield insights into body tissue reserves and diet while serum biochemistry reflects the metabolic status of cows. We explored association among BCS, BW and blood analytes, to investigate the phenomenon of high parity cows being high BW but low BCS. **Methods:** Pre-calving (n=739 cows) and peak milk (n=691 cows) cohorts were selected by stratified (parity) random sampling from 30 farms (15 pasture-based, 15 total mixed ration). Serum, BCS, BW and milk production were collected per cow. Eleven analytes were evaluated and standardised within group (cohort, breed, farm). Mixed linear regression models for BCS and BW were specified, with random effect of group. A 6-point, unordered, categorical body-group metric that combined BCS (>, equal, or < group median) and BW (>, or < group median) was analysed by polytomous logistic regression. **Results:** Pre-calving BCS was positively associated with albumin, urea and glucose, and negatively with cholesterol. Pre-calving BW was positively associated with albumin and negatively with cholesterol. Peak-milk BCS was positively associated with albumin, BHBA and glucose. Peak-milk BW was positively associated with albumin and negatively with calcium. Increasing BW and decreasing BCS was observed with increasing parity, excepting pre-calving 2nd parity cows that had low BCS. The polytomous model associated BCS/BW categories with albumin and glucose in the pre-calving cohort (Figure a) and with albumin, BHBA and milk production in the peak milk cohort (Figure b). Risk of low BCS/low BW was greatest in 2nd parity cows. There were no interactions between parity and analytes. **Discussion:** A polytomous model allowed us to investigate two poorly correlated metrics of tissue protein/energy reserves simultaneously. **Conclusion:** Cows increase BW whilst decreasing BCS as they age. Albumin is often associated with BCS and BW, potentially reflecting labile protein pools and suggests reviewing protein dietary management.



Polytomous model associations amongst body condition score (BCS)/body weight (BW) categories, serum analytes and production from dry cow (a) and peak milk cow (b) cohorts. The * indicate significant difference ($p<0.05$) and error bars are 95% confidence intervals.