Increasing fitness for transport in cull dairy cows

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Welfare of cull cows during transport to slaughter is a current concern in the Canadian dairy industry. Cull cows sold through auction often have a high prevalence of lameness, low body condition score (BCS), hock lesions, and udder engorgement. Transport may further exacerbate these conditions. To address these challenges, thirty-seven cows were selected and randomly assigned to the experimental or control group. Experimental cows (Fed; n=18) were dried off, fed for 60 days, then sent to slaughter, whereas control cows (Direct; n=19) were sent direct to slaughter. Fed cows were assessed for locomotion (5-point scale), BCS (5-point scale), hock lesions (3-point scale), and udder engorgement (3-point scale) weekly until one day before slaughter. Weights of the Fed cows were determined at time of enrollment in the trial and measured again the day before slaughter. Simple t-test and chi-square statistics were used to compare experimental groups for continuous and dichotomous outcomes, respectively. Fed cows gained an average of 135.6 kilograms over the 60 days (SD ± 75.88). Direct cows had an average weight at slaughter of 754.6 kg, whereas the Fed cows' average weight was 839.8 kg (P<0.05, SD ± 93.94). The fed cows' average BCS at the start of the trial was 2.4, and at slaughter was 3.5, with an average gain of 1.2 BCS points. At slaughter, proportion of udders involuted in the Fed group was 44.4% (n=8) and in the Direct cows, was 0% (P<0.05, SD ±0.50). There were no significant differences in locomotion or hock lesions between the fed and direct to slaughter groups (P>0.05).
Take home message: Due to the improved BCS and udder scores, cows fed for 60 days may be better prepared for transportation to slaughter, as well as earn producers more money in the auction ring due to increased weight and body condition.

The effect of dietary cation-anion difference and dietary buffer for lactating dairy cattle during mild heat stress

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The objective was to investigate the interactive effect of dietary cation-anion difference (**DCAD**) and dietary buffer supply on dry matter intake, ruminal fermentation, milk and milk component yield, and gastrointestinal tract permeability in lactating dairy cattle exposed to mild heat stress. Sixteen lactating Holstein cows including 8 cannulated primiparous (80 ± 19.2 DIM) and 8 non-cannulated multiparous (136 ± 38.8 DIM) cows, were housed in a tie-stall barn with a temperature-humidity index (THI) between 68 and 72 from 0600 h to 1600 h followed by night cooling. The experimental design was a replicated 4×4 Latin square (21-d periods) with a 2×2 factorial treatment arrangement. Diets contained low or high DCAD (**LD** = 17.6, **HD** = 39.6 mEq/100g DM) using NH_4Cl and Na-acetate with low or high buffer (**LB** = 0%, **HB** = 1% $CaMg(CO_3)_2$). Total and post-ruminal gastrointestinal tract permeability were evaluated using Cr-EDTA and Co-EDTA, respectively. Treatments had no effect on DMI, milk yield, protein yield, or mean ruminal pH. However, HD increased milk fat by 0.14% and milk fat yield by 40 g/d whereas HB reduced milk fat percentage by 0.12% with no effect on milk fat yield. Buffer supplementation reduced urinary excretion of Co by 26.8% and tended to reduce urinary Cr excretion by 10.2%. Across all treatments 70.8% of the Cr recovery was represented by Co indicating greater post-ruminal permeability. Feeding HD improved blood acid-base balance and increased urine volume by 4 kg/d. While there was no interactive effect between DCAD and buffer, DCAD increased milk fat yield and $CaMg(CO_3)_2$ modulated intestinal integrity in lactating dairy cattle exposed to mild heat stress.
Take home message: When lactating dairy cows in western Canada experience mild heat stress, elevating DCAD from 18 to 40 mEq/100g DM has potential to increase milk fat yield and dietary $CaMg(CO_3)_2$ supplementation may improve intestinal barrier function despite the absence of ruminal acidosis.