

The effects of dietary energy concentration of dry period diet on the eating and rumination time of cows

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Restricting energy intake during dry period may alleviate metabolic stress of dairy cows after calving. However, restricting energy intake may affect eating and rumination behaviour of cows. Our aim was to study the effects of high and restricted energy allowances during dry period on eating and rumination times. Sixteen multiparous Finnish Ayrshire cows were used in a randomized complete block design. The treatments were ad libitum feeding of grass silage (HIGH) or a mixture of grass silage, wheat straw and rapeseed meal (55%: 40%: 5%) (RESTR). Average neutral detergent fibre (NDF) contents of the diets were 528 and 651 g/kg DM. The cows were kept in tie-stalls and daily forage intake and eating behaviour was recorded using forage intake control system (Insentec BV, Marknesse, The Netherlands). Daily rumination time was recorded using rumination monitoring system (Qwes-HR, Lely Industries, Maassluis, The Netherlands). Weekly averages of measured eating and rumination parameters for each cow were used for statistical analysis. The data were analysed using repeated measures ANOVA. Forage dry matter (13.7 vs. 10.8 kg/d) and metabolizable energy intake (144 vs. 109 MJ/d) of cows in HIGH was higher ($P < 0.01$) than cows in RESTR during the dry period. Daily eating time (average 261 min/d) and NDF intake (average 7.4 kg/d) did not differ among groups. Eating rate (56 g DM/min vs. 47 g DM/min) and number of meals/d (13.4 /d vs. 10.7 /d) was higher ($P < 0.01$) in HIGH. Time spent ruminating was longer for HIGH than RESTR (520 min/d vs. 429 min/d, $P < 0.01$). Similarly, rumination time per kilogram of NDF intake was greater for HIGH than RESTR (72 min/kg NDF vs. 60 min/kg NDF, $P < 0.01$), whereas there was no difference in rumination time per kilogram of DM intake. The results suggest that daily rumination time is primarily related to DM intake and not to dietary NDF content in cows fed high-forage diets during dry period, although the potential effect of particle size still have to be considered. Inclusion of straw in the diet decreases rate of eating but it may not prevent the decrease of rumination time caused by restriction of energy intake.

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