

Behavioural response of grazing dairy cows to an acute metabolic challenge

Grazing pasture allows cows to express their natural behaviour. However, due to deviations in herbage quality and quantity exclusive grazing without concentrate may cause periods of lacking energy and nutrients. We have investigated the effect of an abrupt shortage of energy and nutrient supply through a one-week concentrate withdrawal in early lactation on physiological and behavioural parameters including the use of a rotating cow brush. Fifteen cows grazing full-time were supplemented with concentrate in experimental weeks (EW) 1 and 3. During concentrate withdrawal in EW 2, milk yield, protein and urea concentrations, as well as plasma glucose and insulin concentrations decreased. Concomitantly, concentrations of milk fat and acetone and fat-to-protein ratio increased, as well as plasma non-esterified fatty acid and beta-hydroxybutyrate concentrations. Time spent for feed ingestion, rumination, standing and moving increased in EW 2, whereas time spent walking decreased. The proportion of cows using the brush and the duration of this usage decreased with concentrate withdrawal. In EW 3, the investigated traits showed a reverse trend, with the exception of milk protein, eating time and the proportion of cows using the brush. In conclusion, cows could only partly compensate the metabolic challenge by an increased feed intake on pasture. Weather conditions influenced behavioural patterns and thus restrict their ability to early predicting metabolic disorders.

Keywords: dairy cow, grazing, metabolic load, well-being