

## **Relationship between metabolic status and behaviour in dairy cows in early lactation**

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The aim of this study was to analyze relationships between metabolic status (based on plasma metabolites), with feeding behaviour, lying behaviour, and daily motion and steps of dairy cows in week 4 postpartum after a 0-d or 30-d dry period (DP). Data from 81 Holstein-Friesian cows were collected using computerized feeders, accelerometers, and from analyses of EDTA plasma samples for free-fatty acid (FFA),  $\beta$ -hydroxybutyrate (BHB), glucose, insulin, insulin-like growth factor 1 (IGF-1), and growth hormone (GH) concentrations. Cluster analyses on plasma metabolite and metabolic hormone concentrations was used to categorize cows for poor, average, good, or very good metabolic status. Cows with a poor or average metabolic status had greater FPCM yield than cows with a good, or very good metabolic status. Furthermore, cows with a poor metabolic status had a lower DMI, daily number of feeder visits, and lower energy balance (EB) than cows with an average or good metabolic status. In contrast, cows with a poor metabolic status had more visits to the feeder than cows with a very good metabolic status. Cows with a very good metabolic status were all cows with a 0-d DP. These cows had fewer visits to the feeder which is likely related to the lower energy demand for the 12 kg lower daily FPCM yield compared with cows with a poor metabolic status. Feeding rate, daily meal time, lying bouts, steps and motion were not related with metabolic status. In conclusion, better metabolic status in dairy cows in early lactation was associated with a greater DMI, increased feeding activity, and more time spent lying, compared with a poor metabolic status. Lying time can be measured using sensor technology and can be a practical tool to monitor metabolic status in dairy cows in early lactation.

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