

Impact of acute clinical mastitis on cow behaviour

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Abstract

Acute mastitis is one of the most common diseases of high-producing dairy cows. However, there is still lack of knowledge on which precise behaviours change first at the beginning of acute mastitis, and whether behavioural changes might serve as a tool for early detection of clinical mastitis. In addition, mastitis can cause motivational conflict in the behavioural priorities of a cow, and thus blur the classical patterns of sickness behaviour: cows' increased lying behaviour which may be uncomfortable or painful due to the sore udder. To study this, we monitored the behaviour of six cows after induction of acute endotoxin mastitis. Cows served as their own controls. Their behaviour was filmed from 1 day before the induction (control day) to 24 h after the induction (induction day). To follow-up on the inflammation, milk samples were taken and the cows' health status was checked at regular intervals. Mean daily durations were determined for all behaviours, except stepping and body care, for which mean daily frequencies were counted. For standing and lying behaviours, also mean bout durations were analyzed. To examine the effects of time since the induction of mastitis, data were accordingly divided in 2-h periods. We analyzed the effect of induction on overall behaviour and behavioural rhythms with linear mixed models, taking repeated observations into account. Overall cows spent less time lying on the induction day than on the day before, and less on the side of the inflamed udder quarter. Cows also spent longer time overall for eating silage during the induction day, and they also stepped more than during the previous day. Cows spent less time lying and ruminated and drank less when the udder was severely swollen and when they had high fever. We concluded that unlike in typical sickness behaviour, cows did not increase their time spent lying, but instead stood more, and avoided lying on the side of the inflamed udder quarter. We suggest that pain experienced in the udder overrides the motivational the state of the cows' sickness behaviour.

In the future, novel mastitis detection tools should therefore be able automatically detect and combine changes on both physiological parameters (i.e. fever) and complete behavioural patterns consisting of resting, standing and eating behaviours.

Keywords: Sickness behaviour; Mastitis; Dairy cow; Behaviour; Animal welfare

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