

Rumination Time and Reticuloruminal Temperature around Calving in Eutocic and Dystocic Dairy Cows

Authors : Levente Kovács, Fruzsina Luca Kézér, Ottó Szenci

Abstract : Prediction of the onset of calving and recognizing difficulties at calving has great importance in decreasing neonatal losses and reducing the risk of health problems in the early postpartum period. In this study, changes of rumination time, reticuloruminal pH and temperature were investigated in eutocic (EUT, n = 10) and dystocic (DYS, n = 8) dairy cows around parturition. Rumination time was continuously recorded using an acoustic biotelemetry system, whereas reticuloruminal pH and temperature were recorded using an indwelling and wireless data transmitting system. The recording period lasted from 3 d before calving until 7 days in milk. For the comparison of rumination time and reticuloruminal characteristics between groups, time to return to baseline (the time interval required to return to baseline from the delivery of the calf) and area under the curve (AUC, both for prepartum and postpartum periods) were calculated for each parameter. Rumination time decreased from baseline 28 h before calving both for EUT and DYS cows ($P = 0.023$ and $P = 0.017$, respectively). After 20 h before calving, it decreased onwards to reach 32.4 ± 2.3 and 13.2 ± 2.0 min/4 h between 8 and 4 h before delivery in EUT and DYS cows, respectively, and then it decreased below 10 and 5 min during the last 4 h before calving ($P = 0.003$ and $P = 0.008$, respectively). Until 12 h after delivery rumination time reached 42.6 ± 2.7 and 51.0 ± 3.1 min/4 h in DYS and EUT dams, respectively, however, AUC and time to return to baseline suggested lower rumination activity in DYS cows than in EUT dams for the 168-h postpartum observational period ($P = 0.012$ and $P = 0.002$, respectively). Reticuloruminal pH decreased from baseline 56 h before calving both for EUT and DYS cows ($P = 0.012$ and $P = 0.016$, respectively), but did not differ between groups before delivery. In DYS cows, reticuloruminal temperature decreased from baseline 32 h before calving by 0.23 ± 0.02 °C ($P = 0.012$), whereas in EUT cows such a decrease was found only 20 h before delivery (0.48 ± 0.05 °C, $P < 0.01$). AUC of reticuloruminal temperature calculated for the prepartum period was greater in EUT cows than in DYS cows ($P = 0.042$). During the first 4 h after calving, it decreased from 39.7 ± 0.1 to 39.00 ± 0.1 °C and from 39.8 ± 0.1 to 38.8 ± 0.1 °C in EUT and DYS cows, respectively ($P < 0.01$ for both groups) and reached baseline levels after 35.4 ± 3.4 and 37.8 ± 4.2 h after calving in EUT and DYS cows, respectively. Based on our results, continuous monitoring of changes in rumination time and reticuloruminal temperature seems to be promising in the early detection of cows with a higher risk of dystocia. Depressed postpartum rumination time of DYS cows highlights the importance of the monitoring of cows experiencing difficulties at calving.

Keywords : reticuloruminal pH, reticuloruminal temperature, rumination time, dairy cows, dystocia

Conference Title : ICASVM 2017 : International Conference on Animal Science and Veterinary Medicine

Conference Location : Paris, France

Conference Dates : February 23-24, 2017