

Diagnostic validity of real time measurement of reticular temperature for the prediction of parturition and estrus in dairy cows

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The suitability of the reticular temperature (RT) as an indicator for expected parturition and estrus of dairy cows was investigated. 25 parturitions and 43 estruses were recorded. Estrus was confirmed by frequent measurement of milk-progesterone and, retrospectively, by a successful artificial insemination. The RT was measured continuously every ten minutes with indwelling reticular sensors and data were read out by telemetry. The average ambient temperature during the study period was 4.43° C (\pm 7.86) and the mean RT 39.23° C (\pm 0.33). In this study the averages of RT-day, 5 days before up to 2 days after estrus, the RT-4 hour averages from 48 hours up to 20 hours after the temperature maximum at estrus and the RT-day averages 10 days before up to 10 days after calving, were analyzed. Time of day, feeding, breed and lactation number were also considered. RT was sign. influenced by time of day and ambient temperature. RT was also sign. affected by the occurrence of estrus. The mean RT on the day of estrus was 0.15° C higher than the day before. The maximum RT-4-hour average on the day of estrus (39.71° C) was also increased sign. The results for heat detection showed an area under curve (AUC) of 0.81. A sign. effect of parturition on the RT was also found. 48 hours prior to calving RT decreased sign. by 0.43° C. No sign. difference was found between one day before parturition and the day of parturition. Up to a temperature threshold of \geq 0.40° C, 100% of the parturitions were detected by RT within 24 up to 48 hours, with a specificity of up to 93%. The prediction of a parturition within 24 and 48 hours showed an AUC of 0.99. We conclude that continuous RT measurement as used herein is highly suitable for detecting upcoming parturitions and, to a lesser extent, to identify cows in heat. Further results are promising for the early detection of health problems linked with an increase or decrease of body temperature.