

Evaluating CowManager SensOor for Estrus Detection in Dairy Cows in a Tie Stall Barn

S.A. Nowicki^{1*}, M. Guesgen¹, M. Gobikrushanth¹, C. Bench¹,
D.J. Ambrose^{1,2}

¹Department of Agricultural, Food and Nutritional Science, University of Alberta T6G 2P5.²Livestock Research Section, Alberta Agriculture and Forestry
Email: Divakar.Ambrose@gov.ab.ca

Estrus detection primarily relies on behavioural changes including increased activity and physical interactions with herd mates like mounting. Currently estrus detection rates in Canadian dairy herds are <40%. Furthermore, Canadian dairy herds are primarily housed in tie-stall barns where activity is restricted and mounting events cannot be observed. Estrus detection rates in tie stall barns are even lower (<35%). Since traditional visual observations are labour intensive, automated devices for estrus detection are being developed. CowManager SensOor (Agis Automatisering BV, Harmelen, the Netherlands) is a 3D accelerometer that clips over an RFID ear tag. Based on ear movements, the SensOor system classifies behaviours into categories (e.g. high-active, active, not-active, eating, ruminating) and also provides health (temperature) and estrus alerts which are sent to a CowManager computer program. While the SensOor system has been validated for use in a free stall barn, no studies have evaluated the technology in a tie-stall system. In this study, twelve cycling multiparous cows (2 replicates of 7 and 5 cows each) were subjected to an estrus synchronization protocol. Cows received a GnRH injection, then had a CIDR device inserted for 7 d; followed by two prostaglandin F2 α (PGF) injections 12 h apart, with the second timed at CIDR removal. Ovaries were monitored twice daily by ultrasonography until ovulation was confirmed. Ten of 12 cows ovulated (mean interval from 1st PGF to ovulation was 4.5 d). Preliminary analysis of the SensOor data has found significant ($P < 0.05$) differences in high-active, active, not-active, eating, rumination, and temperature measures relative to ovulation. However, validation of the SensOor data against video recordings of cow behaviour is still needed to further evaluate the accuracy and repeatability of the automated system in tie stall cows.