



## ASPA 24th Congress Book of Abstract

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cow. The system applying algorithms to movement intensity patterns and rumination time generated heat and health alerts calculated based on a deviation in current data from historical data. From October to December 2020, 314 events were recorded concerning 146 cows. The events included clinical examinations and/or heat and health alerts. The events were treated as 'gold standard' for detection of estrus and health issues if clinical and behavioral manifestations of heat and a health issue were, respectively, revealed by the authors. The events were classified as true positive, true negative, false positive or false negative depending on concordances and discordances between gold standard and alerts. Statistical measures of the performance of a binary classification test were calculated. Sensitivity, specificity, positive and negative predictive values, and accuracy for estrus detection were 96.3%, 97.0%, 91.8%, 98.7%, and 96.8%, respectively. These values are in line with those recently found on a Slovakian commercial dairy farm (Schweinzer et al. 2019). The same measures calculated for health issue detection were instead 22.7%, 95.6%, 73.5%, 69.6%, and 70.1%, respectively. The system did not recognize issues related to respiratory and reproductive systems while alerted for lameness (28.6%) and diarrhea (64.5%). In Florida, a higher sensitivity for mastitis (53%) and lameness (59%) was found using rumination loggers (Paudyal et al. 2018). The reasons for this disagreement may be due to the different algorithms applied and to the greater accuracy of our clinical examinations and behavioral monitoring. Overall, the investigated system showed excellent performance in estrus detection while accurate clinical examinations and direct monitoring of the farmer seems to be still required for sensitive detection of health issues.

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### Evaluation of a collar monitoring activity and rumination for detecting estrus and health issues in an organic dairy farm

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Early detection of estrus and health issues in dairy cattle are crucial for enhancing animal welfare and boosting profitability. Smart technologies have been recommended for monitoring heat and health minimizing labor requirements (Paudyal et al. 2018; Schweinzer et al. 2019). This study aimed to assess the suitability of the SCR HeatTime<sup>®</sup>HR system to detect estrus and health issues in dairy cows. The study was conducted on an organic dairy farm in North Italy, housing approximately 850 Holstein-Friesian cows; 200 SCR HeatTime<sup>®</sup>HR neck collars were used for continuously monitoring activity and rumination in the group of fresh

#### References

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Schweinzer et al. 2019. *Theriogenology*. 130:19–25.