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Title of the presentation

Using sensor technology to detect
the onset of digital dermatitis in
Holstein cows

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ABSTRACT

Digital dermatitis (DD) is a multifactorial infectious disease of the hoof that causes inflammation and painful lesions primarily located digitally and on the coronary band. Changes in cow behaviors are associated with lameness, yet behavioral data related to the onset of DD is limited. The aim of this study was to evaluate behavioral differences between cows with healthy feet and cows with DD, as well as changes in behavior associated with the onset of DD. Lactating Holstein cows (n = 42) were observed in the parlor daily June - July 2020, for visual hoof evaluations. Behavior data was collected for 1 wk prior to the onset of DD using CowManager® activity monitoring ear tags that recorded activity, eating, and ruminating behaviors, and ear temperature. Data were analyzed using mixed model ANOVA and linear regression in SAS. An interaction was detected between day relevant to diagnosis of DD (Pre-diagnosis, 0/Day of diagnosis, Post-diagnosis) and hoof health (healthy or DD) for active (P < 0.0001) and eating (P < 0.0001) behaviors. Cows with DD tended (P = 0.08) to spend 0.07 ± 0.01 h/d less time active prior to a DD diagnosis. A three-way interaction was observed among day relative to the onset of DD, hoof health, and cow lactation number for inactivity (P = 0.03) and high activity (P = 0.05). Prior to the onset of DD, cows spent 0.03 ± 0.01 h/d less time highly active (P = 0.04). Ear temperature was associated with day relative to the onset of DD and hoof health (P < 0.0001). Prior to the onset of DD, average ear temperature increased by $0.16 \pm 0.03^\circ\text{C}$ (P < 0.0001). In conclusion, cows that developed DD altered their behaviors prior to diagnosis. Understanding the progression of this disease could promote early treatment and better prognosis. :



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