

The effect of a first occurrence of digital dermatitis in early lactation on risk of culling and time-to-pregnancy in lactating dairy cows

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Introduction

Digital dermatitis (DD) is one of the most prevalent types of hoof lesion reported in dairy cows. This higher prevalence in dairy herds is consequential, as DD can not only lead to painful and lameness in severe instances, but DD has also been found to have a negative long-term impact on reproductive performance and longevity. However, the impact of a first instance of DD in cows with no previous lesion history on these negative outcomes is largely unknown, as most previous studies do not account for the impact of lesion chronicity. The objective of this study was to evaluate the effect of a first occurrence of DD in the first 60 days in milk (DIM) in cows with no previous recorded instance of DD on risk of culling and time-to-pregnancy in the first 180 DIM in dairy cows.

Materials and methods

This study is part of a larger study comparing the efficacy of 2 footbath concentrates on the prevention of new cases of DD in cows with no previous lesion history. Lactating cows from 5 dairy herds (~1,300-3,000 cows/herd) were scored for DD lesion presence and severity biweekly in the milk parlor by trained observers for a period of 16 weeks (November 2021 to May 2022). Prior to enrollment, DD was scored in 2 baseline observations, 2 weeks apart. Health and reproduction records were extracted from farm software 6 months following the completion of the study. To be considered for analysis, cows had to have no DD lesions recorded in both hind feet during the baseline period and be < 60 DIM at the time of the study start. Cows were categorized as developing DD in either or both hind legs in the first 60 DIM (DD60) or as not having DD in the first 60 DIM (NoDD). Data was analyzed using Cox proportional hazard models, with time-to-event (i.e., time-to-cull/censor and time to pregnancy/censor) as the outcome, DD lesion occurrence by 60 DIM and parity (1st, 2nd or 3rd or more) as fixed effects and accounting for clustering by farm.

Results

Of the 3097 cows eligible for inclusion in the analysis, 7.2% developed a DD lesion in the first 60 DIM. Overall, 83.9% of cows were pregnant by 180 DIM, with a pregnancy rate of 85.1% (222/261) for DD60 cows and 83.7% (2375/2836) for NoDD cows. The hazard ratio (HR) for pregnancy by 180 DIM for DD60 compared to NoDD was 1.1 (95% CI: 0.93, 1.29), indicating a possible higher likelihood of pregnancy in DD60 cows. The overall cull rate by 180 DIM was 5.9% (186 cows). The cull rate was 4.2% (11/261) and 6.0% (175/2899) for DD60 and NoDD cows, respectively. The HR for culling was lower (0.65, 95%CI: 0.43, 0.98) for DD60 cows compared to NoDD cows.

Significance

These results are unexpected, with cows with a first instance of DD in the first 60 DIM having a higher likelihood of becoming pregnant during the first 180 DIM and a reduced likelihood of culling at any point during the first 180 DIM than cows that did not have DD. Additional research into effects of recurrent DD is warranted to determine if chronic DD poses a more consequential risk to cow survivability and performance.

