Digital dermatitis affects locomotion and gait traits of beef cattle in feedlots

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Introduction
Sparse scientific evidence of cattle in confined environments, like feedlot dirt pens, report on increased importance of digital dermatitis (DD) besides foot rot as an infectious cause of lameness. Therefore, we investigated the associations between DD presence and locomotion, gait traits, feet and leg conformation, and hygiene related risk factors in feedlot cattle to provide the industry with clear guidelines on identification of DD affected cattle.

Materials and methods
Cattle (n = 310) from 13 pens in 3 feedlots were videotaped, enabling locomotion scores (LS) and gait trait scores (GS). Cattle were restrained in a chute, where each hind foot was videotaped, confirmation scored, lifted, and inspected for presence of foot lesions. Cumulative odds logistic regression models determined associations between DD, LS and GS.

Results
In total, 104 cattle had DD (69 and 35 with active and chronic lesions, respectively). Odds ratios for cattle with DD being lame or moderately to severely (M-S) lame was 8.0 (P < 0.001) and 10.1 (P < 0.001), respectively, compared to No-DD. Cattle with active lesions had OR 9.4 (P < 0.001) and OR 14.9 (P < 0.001) for being lame or M-S lame. Likewise, cattle with chronic lesions had OR 6.4 (P < 0.001) and OR 5.5 (P = 0.002) for being lame or M-S lame. Asymmetric gait (AG), and reluctance to bear weight (WB) had the greatest OR for classifying cattle with DD: OR 5.5 (P < 0.001) and OR 5.8 (P < 0.001) for having severely altered gait (OR 8.2; P < 0.001 and OR 17.9; P < 0.001).

Significance
LS remained the best tool to detect cattle with DD, whereas traits like WB and AG had the strongest associations with DD presence. Pens with poor hygiene status were more likely to house DD affected cattle. Crew training focused on LS and more specifically WB and AG will assist in identifying DD affected cattle that need treatment. Due to low Se and relatively low PPV, training and thorough evaluation should be prioritized to avoid financial impact of infectious lameness in feedlot environments.