Prevalence and risk factors for corkscrew claw syndrome in dairy cattle

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Introduction

The objective of this study was to determine the prevalence and associated risk factors for an emerging hoof lesion in growing heifers and adult dairy cattle with no prior reports in the peer-reviewed literature. Corkscrew claw syndrome (CCS) is not the corkscrew claw that we used to see affecting the rear lateral claws of multiparous cows who were victims of poor housing and hoof care. Nor is it the mild corkscrew of the front medial claw that we commonly recognize. Rather, corkscrew claw syndrome is the combination of corkscrew deformities of the medial claws of both the rear and front feet in combination, and it occurs in heifers predominantly, rather than older cows. The condition can be so severe by the time that the heifer calves, the rear medial claw is the dominant weight bearing claw. The anatomical changes that result in this condition appear to be permanent and unrepairable. The pedal bones are irreversibly changed, developing bony exostoses and becoming narrower and rotated within the claw capsule. For that reason, affected herds will see this syndrome affecting all age groups, starting in growing age heifers and following through all the way to the oldest cows in the herd.

Materials and Methods

A convenience sample of Upper Midwest dairy herds was recruited using the expertise of hooftrimmers from the Dairyland Hoofcare Institute (Baraboo, WI) who were asked to identify dairy herds that they trimmed that had a high and low prevalence of CCS. From an initial list of 83 dairy producers contacted, 43 herds agreed to be visited by 2 observers trained to score the rear medial claws for the lesion in heifers and cows during the summer of 2017. Breeding age, pregnant and prefresh heifers were surveyed, along with the high yielding mature cow group of cows. At the visit, details of a variety of environmental and management risk factors were captured and entered into a purpose-built Microsoft Access database. The data were exported into Excel and analyzed using SAS (SAS version 9.4; SAS Institute, Inc., Cary, NC). Univariate linear regression models were built using PROC MIXED, then using variables of significance ($P<0.2$) multivariate models weighted by the surveyed population of heifers were built to explain the prevalence of CCS for each heifer age group and for the overall prevalence of CCS.

Results

The survey found an overall prevalence of CCS across herds of 16% in heifers and 33% in mature milking cows. Data from breeding, pregnant and prefresh heifers showed that prevalence increased with age, from 13% to 18% to 23% for each group respectively. Risk factors for CCS significant in the final mixed model included freestall housing (rather than bedded packs), use of sand bedding (particularly recycled sand) (rather than organic bedding), and use of headlocks at the feed bunk (rather than post and rail or slant bars).

Significance

CCS is a newly recognized lesion affecting heifers in well managed freestall herds in the Upper Midwest; many of which have other common causes of lameness under control. In the surveyed herds, almost one quarter of the heifers were affected on average, by the time that they calve. Risk factors identified in this study support the proposed hypothesis for the development of the lesion, which is that the lesion develops while heifers are pushing against the feed bunk when eating, at a time when the bony skeleton of the limb is developing, putting abnormal forces on the bones, creating the corkscrew deformity observed. The combination of freestalls bedded with abrasive sand bedding with headlocks at the feed bunk appear to be of particular importance.