

An evaluation of the preventative and curative properties of 3 foot bath products used to control digital dermatitis

G. Cramer, DVM, DVSc¹; M. Lopez Benavides, PhD²

¹Cramer Mobile Bovine Veterinary Services, Startford ON, Canada, N5A 7L5

²DeLaval Manufacturing, Kansas City, MO 64153

Introduction

Lameness in the dairy industry has been identified as a disease with both detrimental economical and animal welfare implications. Digital dermatitis (DD) is a common cause of lameness in the dairy industry affecting 90% of free stall herds, and approximately 20% of cows within an affected herd. Common control strategies include the use foot baths with various chemical products including formalin, copper sulfate, antibiotics or commercially available products. Unfortunately, there is very little evidence in the literature supporting the use of these products. Evidence exists to support the use of formalin, copper sulfate, and antibiotics but few studies have been done to determine the efficacy of other commercially available products. The objective of this study was to evaluate the preventative and curative properties of two experimental products in comparison to formalin.

Materials and Methods

The study was carried out in a 300-cow free stall barn that used a combination of sand and wood shavings for bedding. Cows were housed in five groups. Alleys were automatically scraped approximately every three hours. At a pretrial screening the prevalence of DD was approximately 28%. For the study, cows in three groups were allocated to the three different footbath treatments. Cows in group F were assigned the farm's typical footbath protocol and used the farm's existing footbath (six-feet; 180 cm long); cows walked through a 5% formalin bath on three consecutive days per week after the afternoon milking. Cows in groups H and P went through a custom foot bath (eight-feet; 240 cm long) for five consecutive days after the afternoon milking. All cows went through the regular foot bath containing a cleaning solution after the morning milking on five consecutive days. Between group H and P the footbath was manually emptied and refilled with the appropriate solutions following the dosage recommendations.

Prior to the start of the study and weekly thereafter, all cows in groups F, H, and P were evaluated for DD lesions using a graded scoring system (no lesion [O], hyperkeratosis [H], ulcerative [U], granulomatous [G] and papillomatous [P]). Both the front and back of each cow's rear feet were evaluated. To evaluate the preventive efficacy of the products, hooves had to start out the trial with either an O or H and have a minimum of two consecutive data points. For curative efficacy analysis, the hoof needed to start out with a lesion (U/G/P) and have at least two consecutive evaluations. Data were analyzed via logistic regression with MedCalc 11.6.1.0

Results

Data from 265 cows (group F, n = 74; group H, 123; group P, 68) were available for analysis after adjusting for cow group changes due to typical farm management practices. From a preventative perspective, the incidence of new DD lesions was 8.4%, 14.4% and 14.7% in groups F, H, and P, respectively. Group F had a lower incidence ($P < 0.005$) of new DD lesions than did either group H (OR = 0.48; 95% CI, 0.27 to 0.84) or P (OR = 0.55; 95% CI, 0.32 to 0.92); the incidence of new DD lesions did not differ between groups H and P. Cure rates were 13.9%, 17.6%, and 16.2% for groups F, H, and P, respectively; and no statistical difference was found between the products due to a lack of study power.

Significance

This study confirmed the perceived effectiveness of formalin as a preventative footbath and provides some expected outcome data that herd advisors can use when designing a foot health program for their clients. In the field, most footbath products are evaluated on the basis of their perceived curative properties; however, in this study cure rates were low. We suggest that footbath products be evaluated on their preventative properties and not their curative properties.