

## Comparison of Effects of Routine Topical Treatments in the Milking Parlor on Digital Dermatitis Lesions

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### Why is this important?

Digital dermatitis (DD) is an infectious bacterial disease affecting the feet of cattle. The disease results in lesions that can cause lameness, production losses, poor fertility, and decreased animal welfare in dairy cattle. This disease affects up to 92% of farms in Europe and North America – so it's a big deal! Once introduced to your herd, DD is extremely difficult to eradicate; therefore, the focus tends to be on prevention of spread and treatment of lesions. Preventative practices include foot bathing and improved biosecurity. Individual cow treatment is typically done during routine hoof trimming, with topical products such as tetracycline or other antimicrobials applied to DD lesions occasionally.

The use of tetracycline and oxytetracycline for treatment of DD in North America is currently off label, has been associated with antibiotic residues in milk, and contributes to growing concerns regarding antimicrobial resistance. Additionally, antibiotic products are difficult to use routinely and difficult to apply because they require animal restraint or application in the milking parlor, where antibiotics should not be used. There are, however, some non-antibiotic products available commercially and used for control of DD, including Intra Hoofsol liquid (containing copper and zinc) and HealMax (containing glutaraldehyde). These types of products are largely untested and it is important to determine whether their use would constitute an effective treatment strategy.

The objective of this study was to evaluate an 8-week routine treatment program of HoofSol and HealMax for their ability to cure active DD lesions and prevent recurrence of DD lesions compared to either tetracycline or saline.

### What did we do?

A randomized controlled trial was conducted on 10 dairy farms in Alberta. Participating herds had a lactating herd DD prevalence of at least 25% and included only parlor-milked cows, allowing for DD lesion assessment and topical treatment application. Milking parlor DD assessment was performed once weekly for 8 weeks. Cows' hind feet were sprayed with water and a mirror and headlamp were used to inspect feet. Feet were scored according to the M-stage system (M0 is normal skin, M1 is an active lesion <2 cm, M2 is an active lesion >2cm, M3 is a healing lesion, and M4 is a chronic lesion if proliferative growth was present).



Four topical applications were evaluated: 1) HoofSol, 2) HealMax, 3) tetracycline solution, and 4) 0.9% saline. Farmers continued their usual DD management, including footbaths and hoof trimming treatments.

### What did we find?

A total of 2,475 cows were enrolled in the study. A total of 324 cows and 401 feet with active lesions were considered in the analysis for clinical cure. Of the 401 feet, 393 (91%) were cured clinically within the 8-week study period. The number of treatments needed before clinical treatment occurred was 3 for saline, HealMax, and HoofSol and 2 treatments for tetracycline. The probability of clinical cure for active lesions in week 1 was 34, 69, 52, and 79% for saline, tetracycline, HealMax, and HoofSol, respectively. The researchers found that the improvement in clinical cure rates seen with tetracycline, HealMax, and HoofSol over saline was only seen in week 1. In week 2, this effect disappears and there is no difference among treatments across the remaining weeks of the study.

A total of 898 cows and 1,342 feet were used in the analysis of recurrent of active lesions from nonactive DD stages. Of the 1,342 feet, 590 (43%) recurred within the 8-week study period. The mean number of treatments until recurrence was 4 across all treatments. The probability of recurrence of active lesions in week 1 was 9, 11, 11, and 8% for saline, tetracycline, HealMax, and HoofSol, respectively. No product was more effective at preventing recurrence.



### What does it mean?

The commercially available, non-antibiotic topical treatments HealMax and HoofSol were as effective as tetracycline and more effective than saline at clinically curing active lesions with 1 treatment. However, over an 8-week treatment routine, there was no difference among applications for clinically curing or preventing active DD lesions. Of note, hosing feet and applying saline resulted in a probability of clinical cure of 33% in week 1, highlighting the importance of maintaining foot hygiene. Alternatively, this effect could be due to a healing effect of saline.

As producers seek alternatives to antimicrobials in their herd health protocols, they may wish to consider some simple improvements in foot hygiene. For instance, routinely hosing feet in the milking parlor may improve foot hygiene as well as improve contact time of the footbath being used, ultimately resulting in improved control of DD within a herd. Furthermore, no product was superior to saline in preventing active lesion recurrence. Any antimicrobial product currently in use for that purpose is therefore having no positive benefit and usage could be stopped.

### Summary Points

- Digital dermatitis, an infectious bacterial disease of the feet, is an ongoing and major issue on dairy farms, affecting both production and animal welfare.
- There are both antibiotic and non-antibiotic products available for treatment of DD, with this study finding little difference between products after the first week of treatment with respect to resulting in a clinical cure of the DD lesion.
- Foot hygiene is likely a major factor in DD control and includes routine hosing of the feet and improved footbath contact time.