

### 3 To Bandage Or Not Bandage: The Curative Effect Of Bandaging Digital Dermatitis Lesions

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#### Introduction

Digital dermatitis (DD) is an infectious claw disease that causes lameness among cows worldwide. Efforts to eradicate DD have been overly focused on treatment and less so on standardized maintenance practices, like bandaging, to enhance the effects of treatment. In an attempt to examine the role of bandaging in the treatment of DD, this study has examined the effect of bandaging on wound size and locomotion among a sample of dairy cows receiving either antibiotic or non-antibiotic treatment.

#### Materials and Methods

This randomized clinical trial study included (n=162) Holstein Friesian dairy cows, diagnosed with ulcerative DD lesions (M2) upon the first examination (week 0). Cows, ranging from heifers to cows in their 4th lactation, were housed in a stable fitted with cubicles and with concrete flooring.

#### Treatment and Evaluation

All hoofs were cleaned and trimmed by a professional hoof trimmer or a veterinarian. The M2 lesions of cows in the first part of the study (n=85) were sprayed with CTC, a topical treatment containing chlortetracycline (WdT, Garbsen, Germany). Cows were then randomly assigned into either a non-bandaged (n=41, 48%, Group1) or bandaged group (n=44, 52%, Group 2). A topical non-antibiotic gel, containing activated copper and zinc chelate (Intra Hoof-fit gel [IHF], intra Care b.v), was applied to the M2 lesions of cows in the second part of the study (n=78). Cows were then randomly assigned into either a non-bandaged (n=40, 51%, Group 3) or bandaged group (n=38, 49%, Group 4). The bandaging process was standardized and applied by the same veterinarian for all groups. The process of wound healing was evaluated and scored once weekly (weeks 0, 1, 2, 3, 4) according to a visual inspection scheme described by Döpfer et al., 1997 and Berry et al., 2012. Photographs of lesions were taken and later, under the use of a special software package (Jalomed®), were used to track lesion size across observations. The healthy formed skin (M0) was judged as full recovery. Locomotion was also evaluated and scored weekly according to Sprecher et al., (1997) locomotion scheme.

#### Results

Table 1.

Groups	Treatment	No. of lesions week 0	No. of healed lesions* until week 4 (%)
Group 1	CTC	41	18 (43.9)
Group 2	CTC + bandaging	44	38 (86.36)
Group 3	IHF	40	12 (30)

Group 4	IHF + bandaging	38	27 (71.1)
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\* All transitions from painful M2 lesions to M0

CTC Chlortetracycline spray, IHF Intra Hoof-fit gel

A Survival Analysis concluded that healing was significantly higher for bandaged than non-bandaged cows following topical CTC treatment ( $Z = 4.653$ ,  $p < 0.001$ , 95% CI: 2.19 to 6.84). Furthermore, bandaged lesions were significantly less likely to transition into M4 lesions, the chronic DD ( $p < 0.001$ ). A Survival Analysis indicated that healing was significantly higher for bandaged than non-bandaged cows following topical non-antibiotic treatment with IHF ( $Z = 3.352$ ,  $p < 0.001$ , 95% CI: 1.627 to 6.403). Moreover, bandaged lesions were significantly less likely to transition into M4 lesions, the chronic DD ( $p < 0.001$ ). A Wilcoxon Rank Sums Test indicated that bandaging had no effect on locomotion for either cows treated with CTC ( $W = 13601$ ,  $p < 0.27$ , CI:  $-4.58e-05$  to  $1.77e-05$ ) or IHF ( $W = 14369$ ,  $p < 0.332$ , CI:  $4.02e-05$  to  $5.77e-05$ ). However, wound size was significantly larger for cows with locomotion scores between 3 and 5 than for cows with lower scores for both CTC ( $W = 8621$ ,  $p < 0.019$ , 95% CI:  $-2.08$  to  $-0.03$ ) and IHF treatment groups ( $W = 8051$ ,  $p < 0.001$ , 95% CI:  $-2.53$  to  $-0.68$ ).

#### Discussion

Results suggest that bandaging accelerated the healing of DD lesions, regardless of treatment type. Bandaged lesions were significantly less likely to develop into stage M4, the chronic stage of DD. Thus, our study indicates that covering DD lesions is advantageous to both the wound healing process and the cow's wellbeing.

#### References

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Key words: Digital Dermatitis, Bandaging, Healing process, Intra Hoof-fit gel, chlortetracycline