

# The Effect of Different Footbath Solutions on Hoof Health

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## Introduction

Formalin (37 % (w/w) formaldehyde) as a footbath solution is used in Western Europe and the USA as preventative for digital dermatitis (DD) and other interdigital diseases. However, formalin (FA) can cause allergies and the inhalation of vapors may cause membrane and skin irritation, asthma and cancer in people. Although formaldehyde is continuously used in the dairy industry as a footbath ingredient, it is regarded as a chemical hazard (International Hazards Datasheets on Occupation, International Labor Organization) and listed as a probable human carcinogen by the International Agency for Research on Cancer. The development of footbath products that are as effective as formalin, but without the negative human, animal and environmental consequences are required. This study tested the efficacy of Double Action, an effective footbath alternative to formalin. Double Action (DA), a product free of heavy metals and aldehyde, was tested as a preventative of DD and heel erosion in a side by side comparison to 5% formalin footbath solution in a commercial UK herd.

## Materials and Methods

The study was conducted in a commercial 150 cow Holstein dairy farm located in Gloucester, UK for a period of six months (December 2005 to June 2006). Prior to the trial, and for the last five years, cows had been walking through a formalin footbath equipped with a pre-rinse bath. Housing consisted of free stalls with sand as bedding and grooved concrete floors scraped three times per day with a tractor. Cows were housed during the winter months and allowed to graze during the summer. A custom-made automated split footbath (DeLaval AFB) was used for the trial. This allowed the right feet of cows to be exposed to 2% DA and the left side feet to 5% FA once a day, as cows walked for fresh feed through the footbath solution at the exit of the parlour. The footbath was automatically emptied and refreshed daily. Hind feet were scored for DD and heel horn erosion (HE)

in the parlour during milking time. Scoring was performed by the same veterinarian at the beginning of the trial, every four weeks throughout the trial, and at the end of the trial. Although all cows in the herd were scored, only 71 cows that stayed in the herd for the entire trial period were included in the McNemar test for paired results statistical analysis.

## Results

The number of hooves affected with DD was reduced throughout the trial for both treatment groups. There was a 95% reduction (from 29.6% to 1.4%) in hooves affected with DD in the FA group compared to an 80% reduction (from 35.2% to 7.5%) in the DA group ( $p=0.93$ ). In this case, the unexpected reduced effect of the DA treatment was likely due to a pump failure for the first two months of treatment, where the trial the dosage of DA was accidentally reduced to only 25% of the optimal value (0.5% instead of 2%). After the dosage was corrected, the incidence of DD was reduced in the subsequent scorings and the values were similar to the ones registered for FA by the end of the trial. The proportion of hooves affected with HE increased by 113% (from 22.5% to 47.9%) in the FA group, compared to 41% (from 23.9% to 33.8%) in the DA group ( $p=0.07$ ). Overall, the performance of DA was better than FA. Hooves treated with FA and that were affected with DD, HE or DD+HE increased by 30% (from 38% to 49.3%) compared to a 16% (from 45.1% to 38%) decrease for hooves treated with DA.

## Significance

Results of this study indicate that the use of Double Action in footbath solutions provide similar results to 5% formalin for the control of hoof disease in this herd. The use of a product like Double Action has the added value of not being hazardous to the environment and human health. Double Action was effective at improving overall hoof condition when used everyday in a herd with a relatively high incidence of hoof disease.