

Comparison of the Efficacy of Double Action and Copper Sulphate Footbath Solutions for the Control of Digital Dermatitis in Lactating Dairy Cows

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Introduction

Digital dermatitis (DD) is one of the most common causes of lameness all over the world. It also results in important economical losses due to culling, decreased milk production, decreased reproductive efficiency and cost of treatment. A copper sulphate (CuSO₄) footbath is one of the most widespread methods for disinfecting hooves on farm. It is common procedure to dispose of footbath contents by mixing with manure before release into the environment. Excessive release of this heavy metal into the environment has negative consequences and most countries have increased regulations for its use and disposal. Footbath products with similar properties to CuSO₄ and with environmentally-friendly characteristics for the control of DD are required. Double Action is an environmentally-friendly and biodegradable product for use in regular hoof bathing or spraying. The goal of the current trial was to compare the efficacy of Double Action with CuSO₄ for the control of DD in a Belgian dairy farm.

Materials and Methods

A split cow designed study was performed on a dairy farm in Belgium with a high incidence of DD. The herd consisted of 66 Holstein dairy cows milked twice daily. Cows were housed in loose cubicles, with sawdust on mattresses as bedding. They walked on slatted concrete floors that were scraped automatically every two hours. Cows had access to pasture from April to October. For the trial, an automated split foot bath with a dividing wall was made to allow use of footbath products on the left and right hooves of each cow during foot bathing. Foot bathing occurred once a day after the evening milking for five days a week. Left hooves were exposed to Double Action (2% solution) and right hooves to a 5% CuSO₄ solution. Footbath solutions were refreshed daily. The trial ran for 24 weeks (January 2006 to June 2006). Both hind claws of each cow were examined every four weeks for DD scoring. All scoring was done by the same trained evaluator. Statistical analyses were done using the Chi square test.

Results

A difference in the prevalence of affected hooves was observed for both treatments after six months. For the hooves treated with CuSO₄, 40.9% of CuSO₄ hooves were affected at the start of the trial and 51.5% at the end (a 26 % increase). For hooves treated with Double Action, 48.5% had lesions at the start and 37.9% at the end (a 22% decrease). Although the difference in infection prevalence at the end of the trial period between the two treatments was not significant, results suggest a better performance of Double Action than CuSO₄. To look at the incidence of new infections in both treatment groups, hooves with DD symptoms at the start of the trial were excluded from the analyses. At the start of the trial 34 hooves on the CuSO₄ treatment and 39 hooves on the Double Action were free from DD. During the trial, about 50% of hooves from both treatments stayed free from DD and no difference in the incidence of new infections was observed. The efficacy in the control of existing lesions was also evaluated. Double Action was better than CuSO₄ for the control of existing DD cases ($p < 0.05$). At the start of the trial, 32 Double Action hooves and 27 CuSO₄ hooves showed symptoms of DD. At the end of the trial the symptoms of DD had disappeared in 15 Double Action hooves (47% cure rate), but in only 6 of the CuSO₄ hooves (22% cure rate).

Significance

The use of CuSO₄ footbaths in hoof care routines is practiced all over the world and its efficacy is well known. Due to growing concern for the environment, the use of such products is increasingly restricted because of negative environmental impact. An effective alternative to CuSO₄ is provided by Double Action, a product that does not contain heavy metals and is biodegradable. The present study shows that Double Action had a similar efficacy to CuSO₄ for the prevention of new DD cases and was also better than CuSO₄ for the reduction of existing hoof lesions. In conclusion, this study shows that Double Action is an excellent, environmentally friendly substitute for CuSO₄ in the control of infectious hoof care diseases.