

# Economic Evaluation of Various Copper Sulphate Footbath Protocols in the Prevention of Digital Dermatitis on Alberta Dairy Cattle.

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Digital dermatitis (DD) is an infectious disease affecting the hooves of dairy cattle. It has implications on production as well as animal welfare as the lesions are painful and may lead to lameness. A common method to prevent DD is the use of footbaths to decrease the occurrence and severity of DD in the dairy herd. However, numerous products are used and result in immense variation of protocols with differing products, concentration, and frequencies. A cost-benefit economic decision model would be indispensable in the comparison of footbath protocols. The objective of the study is to evaluate the cost-benefit to the farmer of three copper sulphate (CuSO<sub>4</sub>) footbath protocols in the prevention of DD. The three footbath protocols to be compared are 5% CuSO<sub>4</sub> 4 times weekly, 2% CuSO<sub>4</sub> 4 times weekly, and 5% CuSO<sub>4</sub> 4 times every other week. The net benefit of use of these protocols was calculated on a herd basis using costs and prevalence estimates from Alberta data where available. A decision model was created to calculate the net benefit of each protocol. Net benefit was calculated as the revenues due to milk sales and slaughter value minus replacement costs, subsequent treatment costs, fertility losses, footbath costs and the cost to fill quota. Revenues were affected by the consequences of DD lesions on milk yield, fertility, and risk of culling.

**Implications:** Footbath strategies for the prevention of DD lesions in dairy cattle in Alberta are cost effective (Table 1) with 2% CuSO<sub>4</sub> 4 times weekly resulting in the greatest net benefit to farmers over one lactation on a farm with 20% DD. Percentage of cows with DD and herd size were the main drivers of this model and results cannot be generalized to all dairy operations without incorporating these and other variables.

**Table 1. Incremental net benefit of CuSO<sub>4</sub> footbath protocols**

Protocol	Incremental Benefit
2% CuSO <sub>4</sub> 4 times weekly	\$4 976
5% CuSO <sub>4</sub> 4 times every other week	\$3 702
5% CuSO <sub>4</sub> 4 times weekly	Reference