Uptake and effectiveness of interventions to reduce claw lesions in 40 dairy herds in the UK

ZE Barker†, JL Wright†, RW Blowey‡, JR Amory†§ and LE Green*†

† School of Life Sciences, University of Warwick CV4 7AL, UK
‡ Wood Veterinary Group, Gloucester GL2 4NB, UK
§ Centre for Equine and Animal science, Writtle College, Chelmsford, Essex CM1 3RR, UK
* Contact for correspondence and requests for reprints: laura.green@warwick.ac.uk

Abstract

In the final year of a three-year study of lameness in dairy cattle, 40 herds were allocated to either an intervention (22) or control (18) group. Farms in the intervention group were visited by a veterinarian who made up to 16 recommendations to reduce the incidence of lameness based on potential risks for lameness observed at that visit. Farms in the control group were visited and the same observations were made, but no changes recommended. All farms were visited on three further occasions to score the locomotion of all cows and collect information on changes made to the farm. Before intervention, the mean herd size, lactation average milk yield per cow and prevalence of severely lame cows were 122, 8,157 l and 9.85% for the control group and 109, 7,807 l and 9.14% for the intervention group. After the intervention there were no significant differences between the treatments in terms of the change in prevalence of severely lame cows or the change in rate of sole ulcer, white line disease or digital dermatitis. The overall uptake of recommendations was 41.3%. There were no significant correlations between the percentage of risks addressed and the rate of sole ulcer or prevalence of severely lame cows and only a non-significant trend for white line disease. Improvements to cubicle dimensions were associated with a reduction in the rate of sole ulcer, and changing nutrition and adding biotin to the ration were associated with a reduction in white line disease. Conversely, increasing the amount of sawdust to cubicle floors was associated with increased rate of sole ulcer and white line disease and improving cubicle dimensions was associated with increased rate of white line disease.

Keywords: animal welfare, claw disease, dairy cattle, implementation, intervention study, lameness

Introduction

Many risk factors have been associated with lameness in dairy cattle. These include factors related to poor cow comfort or reduced lying times (Barker et al 2007, 2010; Cook & Nordland 2009; Dippel et al 2009), poor quality walking surfaces in yards and passageways (Dembele et al 2006; Barker et al 2010), duration of time housed (Barker et al 2009), quality of tracks to pasture (Chesterton et al 1989; Barker et al 2009) and exposure to slurry or contaminated water in yards and passageways (Borderas et al 2004; Somers et al 2005; Gregory et al 2006). These studies provide statistical associations between lameness and management but do not provide strong evidence that the association is causal. One piece of strong evidence for causality is that when a risk is removed the incidence or prevalence of a disease decreases (Bradford Hill 1965). We do not know the impact of changing the above risks on the prevalence and incidence of lameness in dairy cattle.

There have been few intervention studies to test risk factors associated with lameness in dairy cows. All those published, except one, have used the traditional approach of testing one factor at a time. Hedges et al (2001) used a within-farm randomised control trial with farmers and veterinarians blind to treatment to test the effect of adding biotin to individual cows’ feed on the incidence of claw lesions. There was a significant reduction in the incidence of white line disease of approximately 50% in cows which were fed biotin over 18 months. Manske et al (2002) carried out a clinical trial to test the effectiveness of two topical treatments for digital dermatitis (oxytetracycline and glutaraldehyde) applied to the claw during claw trimming. Topical treatment with oxytetracycline was the most effective treatment. The same authors also carried out a second clinical trial (Manske et al 2002) to test the efficacy of footbathing with acidic ionised copper compared with water, in which copper was more effective at resolving digital dermatitis.

Whilst changing one factor in a study gives a clear indication of whether the factor is associated with a change in outcome, it is an expensive approach and for diseases with many suspected risks that are not independent, one factor chosen might have a small or negligible effect on the incidence of disease when changed in isolation. It is