Tackling hoof infection from both sides is stamping out dermal issues

More than skin deep

Traditional approaches to controlling digital dermatitis are making little impact on the 80% of UK herds that say it's still a problem. Topical treatments are effective at controlling the spread of the disease, but are they tackling it at hoof level?

text **Allison Matthews**

In 2010 survey work carried out by AFBI Hillsborough showed that 79% of Northern Ireland's dairy herds saw digital dermatitis as a significant problem. Thompsons' dairy specialist Richard Moore says that a more recent review has highlighted that this is still the case and ironically modern dairying has contributed to the data. "Larger herd size and the trend towards confinement have both added to these statistics making digital dermatitis a worldwide problem of epidemic proportions. Alongside the detrimental effect on animal welfare, the disease has a significant effect on animal performance, in particular milk yield and fertility, with recent estimates putting the cost, based on current milk prices, at £130 per case."

Treatment options

Footbaths and topical antibiotics have been widely used in the prevention and treatment of these raw, bright-red lesions seen on the skin above the heel bulbs. But Zinpro performance minerals' Arturo Gomez says that a more sophisticated strategy is needed to eliminate the disease. "Additional tools for controlling digital dermatitis include removing risk factors by implementing good hygiene, maintaining sound biosecurity practices, understanding whether an animal suffers chronically from the disease and providing adequate nutrition."

Slurry removal and improved hygiene give a 'hands on' approach to tackling the disease, but Mr Gomez believes that an improvement in skin integrity and the immune response when the bacteria are present can help to reduce both the incidence and the severity of digital dermatitis.

"Although numerous efforts have been made to prevent and control the disease, with traditional strategies based on the frequent use of disinfecting footbaths at herd level and topical treatments of acute lesions at the animal level, these tactics have achieved variable success. Another means of enhancing the disease resistance of the cow is to provide an adequate supply of zinc, manganese, copper, cobalt and iodine within the diet. Zinc has a critical role in wound healing and in maintaining the health and integrity of skin due to its role in cellular repair and replacement," explains Mr Gomez.

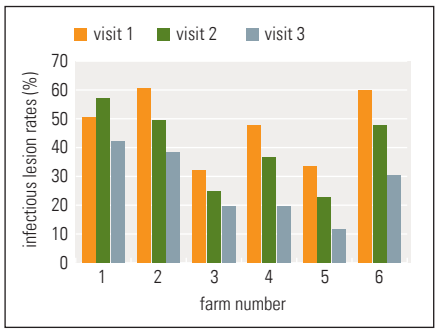

Figure 1: Infectious lesions rates on hind feet in six different herds (Feb to Apr)

The ability to meet trace mineral requirements is affected by mineral interactions with other dietary components, as well as the source of the trace mineral. But there is strong evidence to support an association between cellular immune response, skin health, and wound healing with an adequate nutritional balance and the bioavailability of trace minerals. This can be particularly important in situations where the skin health is compromised by external stressors, such as digital dermatitis.

Digital dermatitis is a multifactorial disease with infectious, immune and environmental components. The causes of the disease are not fully understood, but research both locally and globally has shown that bacteria – present in the typical dairy environment – target areas of poorer skin integrity.

Mr Gomez explains how the housed cow is under continual threat. "A moist, low-oxygen environment, such as the feet of housed dairy cows, provides ideal conditions for the bacteria, and an infection can develop into an outbreak of digital dermatitis within days.

"When the skin barrier is weakened due to irritation and hyper hydration, multiple bacteria have the opportunity to destroy the epidermis, allowing them access to deeper tissues. The result is acute inflammation and ulcerative dermatitis.

Manageable level

"Once introduced, the disease will spread rapidly through the herd, so an integrated prevention and control strategy is essential to keep the presence of the disease at a manageable level. Calves and heifers are often neglected in management plans, but this is often the key point in an animal's development where digital dermatitis can be prevented from occurring in the first place," adds Mr Gomez.

Richard Moore explains how Thompsons' technical team put 1,500 cows on trial in 2013.

"With skin integrity and immune function at the root of disease prevention, the objective was to create a trace mineral product that worked internally and assisted cows in their fight against the onset of digital dermatitis.

"The concept revolved around the knowledge that both skin quality and immune function can be improved with specific supplementation of certain trace minerals.

Technical teams from both Thompsons and Zinpro worked together to formulate the 'DD pack' and set up an on-farm trial to identify the benefits of the product."

Six herds were selected across Northern Ireland and, following a pre-trial assessment, the DD pack product was fed to each one for four months with two further incidence assessments.

All the herds involved were footbathed as part of normal management routine and this practice continued unchanged throughout the duration of the trial.

After four months the average reduction in digital dermatitis across the herd was 44% and some units dropped by 60%.

"This product does not replace the need for digital dermatitis prevention protocols, such as regular footbathing and good slurry management, but it does represent a new trace mineral product and an entirely new approach to controlling and reducing the disease on dairy units," adds Mr Moore. |