Are Your Cows Well Protected Against Facial Eczema This Summer?

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Key points

- Sub-clinical facial eczema (FE) is a problem on at least a third of dairy farms in the North Island.
- Spore counting is good for detecting trends, but to be most relevant, the same paddocks need to be tested each week on *your* farm.
- Chicory and plantain, planted in swards, protect against facial eczema, while tall fescue may have some protective effect.
- Lime has no effect on spore counts.
- Zinc remains the best protection tool but under-dosage is common.
- Farmers need to test a selection of cattle for zinc concentration in the blood and liver damage.

Cause of FE

Facial eczema (FE) is caused by the saprophytic fungus *Pithomyces chartarum* which lives on dead and decaying litter at the base of pastures. When weather conditions are warm and humid the fungus produces spores filled with a toxin (sporidesmin) that, when eaten, causes damage to the liver and bile ducts. Clinical symptoms of FE include photosensitivity, in which the skin quickly becomes inflamed and may peel away, particularly on light coloured areas of the body.

The problems

Images of badly affected stock are highly emotive, and present significant risk to New Zealand's 'clean green image' and reputation for sustaining a high level of animal welfare in farmed livestock.

Costs associated with FE arise from deaths, condemnation of carcasses, poor liveweight gain, poor reproduction performance and lower milk production.

The subclinical effect on milk production is also a concern. Research has shown a much greater proportion of herds have significant liver damage without any obvious clinical symptoms[1].

Recent work on FE

In 2014, a study of 106 North Island dairy herds from nine different FE-prone regions was undertaken to determine the effectiveness of practices to prevent and manage FE.

Results indicated that 32 percent of farms had sub-clinical FE damage. If this figure reflects an average incidence in FE-prone areas, the cost to the industry would equate to $78 million in lost production.

In 2016, 1040 heifers were blood sampled to check for FE damage. 25% of them had severe liver damage and only one animal showed clinical signs.

Better spore counting

Spore counting is currently the most widely used method to assess the potential intake of toxic spores by grazing animals, and thus their risk of FE.

The spore counting technique[2] most used by farmers, veterinarians, laboratories and researchers involves collection of 200 g of pasture by walking diagonally across a paddock and stopping at 10 points to cut pasture at the base. A 60g sample of pasture is then randomly selected and added to 600 ml of water, then shaken vigorously for three minutes. The pasture is removed, leaving the 'wash water'. An eye dropper is used to collect a sample of the solution (water aliquot) to read under a microscope at 100x magnification. Depending on the depth of the grids, the total pasture spore counts/g pasture are estimated by multiplying the number of observed spores by 5,000 or 10,000.

In 2013, this method was closely examined by analysing 12,784 spore counts from multiple sites within a paddock from four farms. Throughout the sampling period, there was a large variation between farms (0-490,000 spores/gram pasture) and a large amount of variability between individual sites in the paddock.

What this all means is that spore counts need to be taken from multiple paddocks and at regular intervals on the farm of interest.

Control options

Pastures

The role of pasture species in the control of FE was initially researched on multiple paddocks in Northland, Waikato and Palmerston North from 1997-2000. Results from this study suggested species supporting low levels of *P.chartarum* were chicory, red and white clover, lotus and tall fescue, while the species supporting high levels of *P. chartarum* were ryegrass, cocksfoot, browntop, and Yorkshire fog[3].

A trial completed on a DairyNZ farm in 2012 showed that mixed pastures that incorporated tall fescue, chicory, plantain and lotus had similar spore counts to ryegrass pastures. This indicates that just including species known to be "FE safe" into pasture is not enough to decrease paddock spore counts. They are only an effective control measure when grown in pure swards.

Fungicide sprays

Fungicides act on mitosis and cell division in susceptible fungi and therefore slow down the development and spore production of the fungus.[4] To be effective, spraying needs to be

accurate and completely cover the entire paddock which includes fence lines, under shelter belts, around troughs and under trees. The spray prevents the fungus from developing, so if spore counts are high prior to spraying, the fungicide will not perform to expectation.

Zinc dosing

Although all methods of zinc administration can be effective, all methods equally can fail. As a general rule, the more control a farmer has on the amount of zinc a cow receives (drenching, capsules), the more likely it is that the cows are receiving the correct amount of daily zinc.

Why FE control fails

The 2014 study looked for possible reasons for breakdowns in control of FE.

The key findings were:

- Blood sampling of 10 cows per farm showed 32 percent of these herds had experienced a FE challenge (liver damage).
- Pasture spore counting was significantly under-utilised as a tool for FE management. Only 33 percent of herd managers reported that they measured spore counts on their own farm.
- Only 31 percent of cows that received zinc supplementation had sufficient serum zinc concentrations to protect against FE. Most farmers were unintentionally under-dosing cows.
- Zinc in the water is the most common method used but the least effective at achieving adequate zinc levels in cows.
- All FE management strategies had obvious opportunities for error to occur and were likely reasons why blood zinc levels were so low. The main problems identified included: (a) unknown and wide variation in cattle weights within the same herd, and (b) failure to monitor blood zinc levels and liver damage in cattle which would allow management protocols to be adjusted, if necessary.

Protocol in place

DairyNZ now has a protocol for farmers to follow to give the best chances of protecting against facial eczema damage (http://www.dairynz.co.nz/animal/health-conditions/facial-eczema/).

In future, protection against FE will be improved by the selective breeding of dairy cattle for tolerance to sporidesmin (see DairyNZ July 2014 Technical Series). Semen from 'FE tolerant' bulls is already available on the market. However, increasing protection via breeding programmes is a slow process, so zinc treatment will remain the best FE protection tool for some time yet.

References

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