

Facial Eczema

Management for New Zealand dairy herds



DairyNZ 

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Introduction

The facial eczema prevention management protocol details a list of steps farmers need to take if they are managing facial eczema through the use of zinc or fungicides.

It is possible to influence the impact of facial eczema through the use of alternative pasture species. Previous research has shown that herbs such as chicory or plantain in pure swards do not provide an environment suitable for the fungus to grow in and are therefore considered facial eczema safe pastures. A study funded by DairyNZ and the Sustainable Farming Fund in 2012 showed that the use of tall fescue in a pure sward had lower pasture spore counts than ryegrass pastures and is also an option to help reduce, but not prevent, the build-up of facial eczema spores on farm.

Previously, some farmers have used lime on their pastures to help reduce facial eczema spore counts. A study funded by DairyNZ and the Sustainable Farming fund in 2013 has shown that lime does not reduce pasture spore counts whether it is applied early in the season or as the spore counts peak. Therefore it is not a viable option for controlling facial eczema.

Monitoring pasture spore count steps

Pasture spore counting is an excellent tool to visualise pasture spore count trends. However trial work funded by DairyNZ and Sustainable Farming Fund from 2012 to 2014 showed that the variability in spore counts between farms is very large. This is because the fungus lives on dead matter and thrives on moisture, warmth and humidity. Every farm, paddock and even sections of paddocks contains a slightly different micro-climate for the fungus and therefore it is possible to have spore counts varying by as much as a 500,000 spores/g of pasture or more between farms and between paddocks.

Therefore when regional spore counts start trending upwards to reach 20,000, it is important to gather a picture of your own farm. Collecting samples from four paddocks representative of the farm is the best way to visualise spore count trends. As it is the trend that management decisions are based on, this is a preferable method to spore counting different paddocks the cows might graze in the next 24-48 hours.

Similarly, it is not uncommon for spore counts to decrease unusually early or unusually late. Therefore do not stop your management program until you are certain that the spore counts are trending down and are consistently below 10,000 spores/g for three weeks.

By following the spore counting protocol, the variability of the test has been shown to be +/- 10,000 spores/g pasture for spore counts between 0-50,000. The variability rises to +/- 45,000 spore/g pasture as paddock spore counts increase above 50,000 spores/g pasture and therefore should be interpreted and communicated with caution.



Weighing cattle and dosing according to weight.

A study funded by DairyNZ and Sustainable Farming fund in 2014 surveyed 105 farms from nine different regions of the North Island of New Zealand and weighed and sampled 10 cows from each farm. This study showed that the majority of farmers were not weighing their cattle prior to selecting a dose for an average cow weight. The average range of weights just between 10 selected cows in a herd was 160kg. Some herds had as much as 300kg difference between the smallest and largest cow sampled. To get an accurate dose, farmers need an accurate weight estimate of the herd average and range.

Management methods such as drenching and capsuling allow farmers to dose differently for larger or smaller cows. It is recommended that individual cattle that are significantly larger or smaller are identified and dosed accordingly to prevent under or over dosing.

Zinc check and liver check

The 2014 facial eczema study mentioned previously found that 32 percent of farms had at least one cow with evidence of facial eczema damage. Only 29 percent of cows that were receiving zinc supplementation achieved serum zinc levels in the recommended protective range for the prevention of facial eczema.

Despite this, 70 percent of farms thought that their management programme was effective. The main reason for thinking this was because they had not seen clinical signs of facial eczema. Most cattle with facial eczema damage will not show clinical signs therefore blood tests looking for sub-clinical liver damage are the only way of checking the effectiveness of your management program.

Conclusion

It is important that all decisions about the timing and effectiveness of your management of facial eczema are based on quality information collected on your farm.

Steps to managing facial eczema using zinc

Making the decision to start programme

1. Monitor regional spore counts

When regional spore counts trend upwards to reach 20,000 spores/g pasture continue to Step 2.



2. Monitor farm spore counts

Choose 4 paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/south, new/old pasture)

When spore counts on these paddock trend upwards to reach 30,000 spores/g pasture or more continue to Step 3.



3. Weigh a selection of cattle

A representative sample of at least 20 cows from each of the mobs to be treated to work out average and range of weights to calculate the dose of zinc required.



4. Dose cows with zinc at full rates

Refer to the product choice and individual protocols attached for details of different treatment options.



5. Check your management program is working

Select 10 cows to test for serum zinc and GGT 3-6 weeks after programme has started.



6. Monitor regional spore counts

When spore counts start to trend down to reach 30,000 spore/g pasture go to Step 7.



7. Monitor farm spore counts

When farm spore counts are consistently at 10,000 or less for three weeks and this is accompanied by cooler temperatures, you can stop your management programme.

Start again if the weather becomes suitable again for facial eczema.

Setting the correct dose rates

Is my programme working?

Making the decision to end programme

Zinc water treatment: In-line dispenser

- 3-4 weeks before pasture spore counts start to rise**
- Calibrate the in-line dispenser to ensure that it empties the concentrate container over a 24 hour period. Determine the settings required for different weather conditions (temp, rainfall)
 - Ensure that all other water sources are inaccessible to cattle.
 - Monitor regional pasture spore counts
 - Calculate dose rate
 - Weigh representative sample of at least 20 cows from each mob to be treated to calculate the average weight of each mob
 - Calculate the amount of product to add to the in-line dispenser to provide a full dose.
For example:
Dose rate for your product (as per label) is 8g/100kg
Average weight for mob is 450kg
Full dose is 450kg/100kg x 8g = 36g/cow
Amount of product to add to in-line dispenser for 350 cows
= 350 x 36g = 12,600g or 12.6kg
 - Start giving the cattle the priming dose which should be half the full dose every day
 - Start monitoring pasture spore counts in your region.
-

- When regional pasture spore counts trend up to 20,000**
- Monitor pasture spore counts on YOUR farm
- Choose four paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/south, new/old pasture)
 - Monitor the four paddocks weekly.
-

- When your pasture spore counts trend upwards to 30,000**
- Increase to full dose as calculated
- Monitor in-line dispenser and or pump daily for water leaks.
-

- 2-3 weeks into the full programme**
- Zinc check
- Select 10 animals with a range of weights, and production to blood test for serum zinc
 - Discuss results with your veterinarian.
-

- 6 weeks into programme**
- Blood test for liver damage
- Select 10 cows representative of the mob for a blood test for serum GGT levels
 - Discuss results with your veterinarian.
-

- Near the end of the FE season**
- Monitor regional spore counts
- When regional spore counts start trending down to reach 30,000 spores/g pasture start monitoring your own farm spore counts.
- Monitor YOUR spore counts
- When your pasture spore counts are consistently at 10,000 or less for 3 weeks and this is accompanied by cooler temperatures, you can stop your management programme
 - If you have stopped earlier than you are used to, please keep an eye on regional spore counts for any spore count movements.
-

Zinc water treatment: PETA dispenser

When regional pasture spore counts trend up to 20,000

- Monitor pasture spore counts on YOUR farm
- Choose four paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/ south, new/old pasture)
 - Monitor the four paddocks weekly.
-

When your pasture spore counts trend upwards to 30,000

- Weigh a representative sample of at least 20 cows in each mob
 - Calculate a full dose rate to cattle
- Follow the dose rate supplied by the product of choice and apply this to the cattle average weight. For example:
- Zinc Heptahydrate dose: 8g/100kg*
Average weight: 450kg/100kg x 8g = 36g/cow
350 cow herd = 350 x 36g = 12,600g or 12.6kg zinc per 24 hours
- Administer full dose rates
 - Monitor the PETA dispenser daily.
-

2-3 weeks into the full programme

- Zinc check
- Select 10 animals with a range of weights, and production to blood test for serum zinc
 - Discuss results with your veterinarian.
-

6 weeks into programme

- Blood test for liver damage
- Select 10 cows representative of the mob for a blood test for serum GGT levels
 - Discuss results with your veterinarian.
-

Near the end of the FE season

- Monitor regional spore counts
- When regional spore counts start trending down to reach 30,000 spore/g pasture start monitoring your own farm spore counts.
- Monitor YOUR spore counts
- When your pasture spore counts are consistently at 10,000 or less for 3 weeks and this is accompanied by cooler temperatures, you can stop your management programme
 - If you have stopped earlier than you are used to, please keep an eye on regional spore counts for any spore count movements.
-

Zinc drenching

- When regional spore counts trend up to 20,000**
- Monitor pasture spore counts on YOUR farm
- Choose four paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/ south, new/old pasture)
 - Monitor the four paddocks weekly.
-

- When your pasture spore counts trend upwards to 30,000**
- Weigh a representative sample of at least 20 cows in each mob
 - Calculate the dose rate for cattle of different weights eg average, small and large. Follow the dose rate supplied by the product of choice and apply this to the cattle average weight. For example:
Supa zinc oxide dose rate: 3g/100kg
 $400\text{kg}/100\text{kg} \times 3\text{g} = 12\text{g/day}$
 $450\text{kg}/100\text{kg} \times 3\text{g} = 13.5\text{g/day}$
 $500\text{kg}/100\text{kg} \times 3\text{g} = 15\text{g/day}$
 - Determine how you will use the drench gun (e.g. time required to hold down nozzle or number of squirts) to deliver the different doses for the three different sizes of cattle
 - Administer full dose rates to cattle every 24 hours. During administration allow for the different sizes of cattle as calculated above.
-

- 2-3 weeks into the full programme**
- Zinc check
- Select 10 animals with a range of weights, and production to blood test for serum zinc
 - Discuss results with your veterinarian.
-

- 6 weeks into programme**
- Blood test for liver damage
- Select 10 cows representative of the mob for a blood test for SGGT levels
 - Discuss results with your veterinarian.
-

- Near the end of the FE season**
- Monitor regional spore counts
- When regional spore counts start trending down to reach 30,000 spore/g pasture start monitoring your own farm spore counts.
- Monitor YOUR spore counts
- When your pasture spore counts are consistently at 10,000 or less for 3 weeks and this is accompanied by cooler temperatures, you can stop your management programme
 - If you have stopped earlier than you are used to, please keep an eye on regional spore counts for any spore count movements.
-

- Drying cattle off**
- If cattle are dried off before spore counts are consistently at 10,000 or lower and will no longer be brought into the shed for regular drenching you will need to administer another form of zinc over this period.
-

Zinc in feed: In shed feeders

- 3-4 weeks before pasture spore counts start to rise**
- Weigh representative sample of at least 20 cows from each mob to be treated to calculate the average weight of each mob
 - Talk to the feed company about adding zinc to the feed so the dose can be discussed for the average weight you are treating
 - Make sure that you allow for an appropriate amount of feed wastage when calculating the dose required
 - Monitor regional pasture spore counts.
-

- When regional pasture spore counts trend up to 20,000**
- Monitor pasture spore counts on YOUR farm
- Choose four paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/ south, new/old pasture)
 - Monitor the four paddocks weekly.
-

- When your pasture spore counts trend upwards to 30,000**
- Administer a full dose of zinc to cattle in the feed every 24 hours.
 - If you are adding zinc manually to the feed follow the dose rate supplied on the product of choice and apply this to the average cattle weight.
 - Make sure you allow for feed wastage when working out the dose.
For example:
Average herd weight 450kg, 400 cows total, 5% wastage of feed
Supa zinc oxide dose rate: 3g/100kg
 $450\text{kg}/100\text{kg} \times 3\text{g} = 13.5\text{g/day} \times 400 \text{ cows} = 5400 \text{ gms}$
 $5.4\text{kg/day} \times 1.05 \text{ (to allow for 5\% wastage)}$
Total of 5.7kg added/day
-

- 2-3 weeks into the full programme**
- Zinc check
- Select 10 cows with a range of weights, and production to blood test for serum zinc
 - Discuss results with your veterinarian.
-

- 6 weeks into programme**
- Blood test for liver damage
- Select 10 animals representative of the mob for a blood test for serum GGT levels
 - Discuss results with your veterinarian.
-

- Near the end of the FE season**
- Monitor regional spore counts
- When regional spore counts start trending down to reach 30,000 spore/g pasture start monitoring your own farm spore counts.
- Monitor YOUR spore counts
- When your pasture spore counts are consistently at 10,000 or less for three weeks and this is accompanied by cooler temperatures, you can stop your management programme
 - If you have stopped earlier than you are used to, please keep an eye on regional spore counts for any spore count movements.
-

- Extra note**
- If there are cattle that definitely do not eat the feed, you will need to consider another way to administer zinc to those cattle.
-

Zinc in feed: Feed pad

When regional pasture spore count trend up to 20,000

- Monitor pasture spore counts on YOUR farm
- Choose four paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/ south, new/old pasture)
 - Monitor the four paddocks weekly.
-

When your pasture trend upwards to 30,000

- Weigh a representative sample of at least 20 cows in each mob
 - Follow the dose rate supplied by the product of choice and apply this to the cattle average weight
 - Make sure you allow for feed wastage when working out dose
For example:
Average herd weight 450kg, 400 cows total, 10% wastage of feed
Supa zinc oxide dose rate: 3g/100kg
 $450\text{kg}/100\text{kg} \times 3\text{g} = 13.5\text{g}/\text{day} \times 400 \text{ cows} = 5400 \text{ gms}$
 $5.4\text{kg}/\text{day} \times 1.1 \text{ (to allow for 10\% wastage)}$
Total of 5.9kg added/day
 - Administer full dose rates to cattle every 24 hours.
-

2-3 weeks into the full programme

- Zinc check
- Select 10 cows with a range of weights, and production to blood test for serum zinc
 - If different mobs are treated differently with feed quantity or type, ensure all mobs are represented
 - Discuss results with your veterinarian.
-

6 weeks into programme

- Blood test for liver damage
- Select 10 cows representative of the mob for a blood test for serum GGT levels
 - Discuss results with your veterinarian.
-

Near the end of the FE season

- Monitor regional spore counts
- When regional spore counts start trending down to reach 30,000 spore/g pasture start monitoring your own farm spore counts.
- Monitor YOUR spore counts
- When your pasture spore counts are consistently at 10,000 or less for three weeks and this is accompanied by cooler temperatures, you can stop your management programme
 - If you have stopped earlier than you are used to, please keep an eye on regional spore counts for any spore count movements.
-

Extra note

If there are cattle that definitely do not eat the feed, you will need to consider another way to administer zinc to those cattle.

Zinc: Slow release bolus

**When regional
pasture spore counts
trend up to 20,000**

- Monitor pasture spore counts on YOUR farm
- Choose four paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/ south, new/old pasture)
 - Monitor the four paddocks weekly.
-

**When your pasture
trend upwards to
30,000**

- Weigh all cattle and record the weights against the cow number
 - With a permanent marker, mark the slow release bolus with the individual cow identification
 - Administer the appropriately sized, marked bolus according to the weight of each individual cow
 - Mark the cow with a spray marker after administration
-

**4 weeks after
slow release bolus
administration**

- Choose the same four paddocks for spore count monitoring on your farm
 - If spore counts are over 30,000 spores/g pasture then administer another bolus according to the product recommendation for timing
 - If spore counts are equal or below 30,000 spores/g pasture continue to monitor weekly.
-

**Near the end of the
FE season**

- When your pasture spore counts are consistently at 10,000 or less for three weeks and this is accompanied by cooler temperatures, you can stop your management programme
 - If you have stopped earlier than you are used to, please keep an eye on regional spore counts for any spore count movements.
-

Fungicide

When regional pasture spore counts trend up to 20,000

Monitor pasture spore counts on YOUR farm

- Choose four paddocks that are representative of the farm (e.g. flat/ hill, east/west, north/ south, new/old pasture)
 - Monitor the four paddocks weekly.
-

When your pasture spore count trend upwards to 20,000

- Decide on whether to spray the whole farm, sections of the farm or certain paddocks
 - Grass in each paddock needs to be green and growing
 - Individually spore count each paddock for spraying. If any paddocks have spore counts over 20,000 spores/g pasture do not spray them.
 - When choosing an appropriate product for spraying make sure to take note of:
 - specific application tools or contractors
 - rain fast
 - whether the product requires a surfactant.
-

Spray farm

Spray every square meter of grass that is grazed with the chosen product

Monitor sprayed paddocks

Every week choose a paddock the cows are about to enter to check your management program is working.

30-40 days after fungicide application

Monitor YOUR spore counts

- Use the four paddocks selected earlier for your own farm spore counting. When spore counts trend upwards to reach 20,000 spore/g pasture start from Step 2 again
 - When your pasture spore counts are consistently at 10,000 or less for three weeks and this is accompanied by cooler temperatures, you can stop your management programme
 - If you have stopped earlier than you are used to, please keep an eye on regional spore counts for any spore count movements.
-

Pros, cons and costs of different management methods

Water treatment – In-line dispenser

Pros	Cons	Labour	Approximate cost
Convenient.	Individual cow dose dependent on water intake.	In-line dispenser filled with zinc solution every 24 hours.	450kg cow
Can administer other minerals at the same time.	Water intake is dependent on: <ul style="list-style-type: none"> • temperature • humidity • dry matter intake • milk production • herd hierarchy • water palatability. <p>Does not allow for weight variation in herd.</p> <p>Water leaks will disrupt cow dose.</p> <p>Access to other water sources will disrupt dose.</p> <p>Have to start very early so cows get used to taste and troughs are primed.</p>	In-line dispenser checked during the day to monitor for water leaks and to alter dose depending on weather.	Zinc:4-5c/cow/day 130 day treatment 30 days half dose 100 days full dose About \$4.60/cow for the season

Water treatment – PETA dispenser

Pros	Cons	Labour	Approximate cost
Convenient.	Individual cow dose dependent on water intake.	PETA dispenser filled every 24 hours.	450kg cow
Automatically adaptable to variations in herd water intake.	Water intake is dependent on: <ul style="list-style-type: none"> • temperature • humidity • dry matter intake • milk production • herd hierarchy. <p>Does not allow for weight variation in herd.</p> <p>Water leaks in the trough that the dispenser is in will disrupt cow dose.</p> <p>Access to other water sources will disrupt dose.</p> <p>Have to start approximately a week early so cows adapt to changes in taste of water.</p>	Troughs regularly checked during the day to make sure zinc is being absorbed and there is no over flow of water.	Zinc: 4-5c/cow/day 100 days treatment About \$4.00/cow for the season

Fungicide

Pros	Cons	Labour	Approximate cost
Convenient . Cows receive no/less zinc.	Cannot use if grass is not growing. Cannot not use if spore counts are over 20,000 spores/g pasture. Have to spray every square meter of grass that is grazed.	Either spraying whole farm with the quad bike or tractor Or Spraying a smaller section of the farm with a quad bike or tractor that the helicopter cannot reach.	\$11/ha Application cost will need to be added to this

Zinc in meal feed

Pros	Cons	Labour	Approximate cost
Convenient.	Variability in feed intake will alter individual dose. Does not allow for weight variation in herd. Need to allow for wastage of feed when calculating dose.	Organising zinc in feed from the feed company. Manually adding zinc to the in shed feed.	450kg cow Zinc: 5-6c/cow/day 100 day treatment

Zinc in feed on feed pad or pasture

Pros	Cons	Labour	Approximate cost
Convenient.	Often large variability in feed intake that can result in both under-dosing or over dosing. Does not allow for weight variation in herd. Zinc can be unevenly spread if not using a mixer wagon which is a risk for under-dosing or over dosing. Need to allow for wastage of feed when calculating dose.	Manually adding the correct quantity of zinc to the mixer wagon or feed out wagon daily.	450kg cow ZnO treatment Zinc: 5-6c/cow/day 100 day treatment About \$4.00/cow for the season

Drenching

Pros	Cons	Labour	Approximate cost
Consistent quantity of zinc being administered. Ability to change dose base on size of cow. Don't have to start really early for cows to get used to taste.	Labour intensive. May overdose or under-dose if the average weight cow dose is administered to all cows.	Physically drenching cattle once daily.	450kg cow Zinc: 5c/cow/day 100 day treatment About \$5.00/cow for the season

Slow release bolus

Pros	Cons	Labour	Approximate cost
Zinc can be administered then not worried about for the next month. Consistent quantity of zinc being administered. Ability to change dose base on size of cow Don't have to start really early for cows to get used to taste. Do not have to check zinc levels of cattle.	Labour intensive. Can cause damage or death to animals if administered incorrectly. Cannot use damaged or broken capsules.	Half to full day of labour to administer the capsules each time to the herd.	450kg cow 55c/cow/day (28 day interval between boluses) 3 bolus treatment About \$45.00/cow for the season

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