Dairy Australia

Facial eczema

What is it

Facial eczema occurs when cattle ingest spores of the fungus Pithomyces chartarum which grows in the dead leaf material at the base of pastures, mainly on ryegrasses because of its ability to produce large quantities of dead litter. The spores multiply rapidly in warm and moist conditions – overnight temperatures of above 120C for 4 or more consecutive nights and frequent irrigation or more then 4mm rain in 48 hours. The highest risk for spore ingestion is mid-summer and autumn. Late haymaking, topping or mowing of pastures may increase the substrate for fungal growth and sporulation, increasing pasture toxicity potential. Spores contain a toxin (sporidesmin) which when ingested damages the liver and bile ducts.

Figure 1 P. chartarum mycelia and hand-grenade shaped spores

Source: C Mulvaney, AgriNetworks, NZ (2011)

Key points

- Caused by ingestion of fungal spores from pasture.
- A toxin within the spores damages the animal's liver.
- The liver is unable to function properly, waste products in the blood stream react with sunlight in the skin, causing characteristic "sunburn".
- Most animals affected with facial eczema don't have visible skin changes.
- There is no specific treatment for facial eczema, affected animals should receive pain relief.
- Supplementation with zinc oxide in feed and/or slow-release zinc oxide boluses during high risk periods is the mainstay of prevention.

Symptoms and signs

Facial eczema is named for the visible signs of photosensitisation that affects non pigmented skin exposed to sunlight, resulting in severe skin inflammation and sensitivity to sun. This is called photosensitisation and occurs because the damaged liver is unable to breakdown products from the chlorophyll in grass, which in turn builds up in the bloodstream and reacts with sunlight. However, in most outbreaks of the disease the majority of animals show little or no visible skin lesions but have suffered liver damage, photosensitisation tends to occur about two weeks after exposure to the toxin.

One of the first signs of facial eczema may be a sudden drop in milk production and a short period of diarrhoea. Research conducted in New Zealand suggests that for every clinical case of facial eczema, there may be a further 10 cows with liver damage and reduced milk production.

Figure 2 Typical FE skin lesions

Figure 3 Fibrosed left liver lobe

Source: J Malmo, Maffra Veterinary Centre (2011)

Diagnosis

Due to the varied signs of facial eczema, it can be difficult to differentiate between true facial eczema and other causes of secondary photosensitisation. A blood test for a liver enzyme called GGT can be performed by your veterinarian which when interpreted in conjunction with elevated pasture spore counts supports a diagnosis of facial eczema.

Spore monitoring program

Pasture spore counts are the main way to monitor the risk for facial eczema in your herd and allow for intervention before an outbreak occurs. The Facial Eczema Spore Monitoring program run though Dairy Australia, GippsDairy and Dairy NSW enables farmers and their advisors to make more informed decisions on when to start and stop facial eczema prevention measures.

Spore counts of >100,000/gram grass are generally considered to be toxic in the short term. However, total spore counts do not account for the cumulative effect of ingestion of low amounts of the sporidesmin toxin over long periods. Grazing a pasture with a spore count of 10,000 for ten days has the same toxic effect on an animal as grazing a pasture with a spore count of 100,000 for one day.

When local pasture spore counts are trending upwards of 20,000 spores/gram and weather conditions look favourable for sporulation, farms should consider monitoring their own pasture spore counts and implement facial eczema control and prevention strategies.

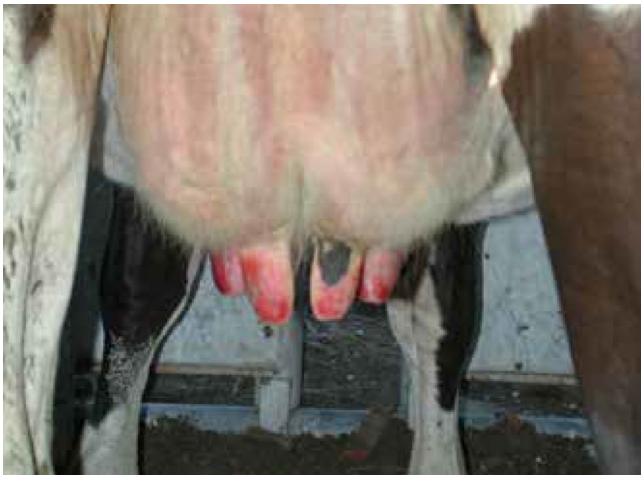
Spore counts for Gippsland and Southern NSW are monitored and updated in real time from January to May each year. Discover more about the program by visiting **Facial Eczema Spore Count Data | Dairy Australia**.

Treatment

The treatment for facial eczema is non-specific and is aimed at reducing pain and irritation associated with photosensitisation as there is no cure. Ideally, affected animals should be kept indoors in darkened buildings during daylight hours and allowed to graze at night. At a minimum they must be given access to shelter. This will prevent the development of further skin lesions and allow the existing lesions to heal while the liver regenerates. Areas where skin is peeling should be dressed with sun-blocking ointments. All affected animals should receive pain relief. It may be necessary to dry off severely affected lactating dairy cattle. Cows have a remarkable ability to regenerate their liver, however animals severely affected by FE may have problems in the following spring. These may be metabolic problems related to calving or further photosensitisation. In these cases, liver regeneration, although sufficient to handle normal daily requirements, may be insufficient to cope with the additional demands of spring (e.g. added burden of the fast-growing foetus and greater absorption of phylloerythrin from grass). In general, young stock tend to recover better than older animals.

As there is no cure for facial eczema, prevention at high-risk times is key to minimise affected animals. Zinc supplementation is to the mainstay for reducing the risk of facial eczema. Importantly, Zinc does not prevent development of the disease if given after the sporidesmin challenge, nor does it have a therapeutic effect when given to animals already affected by the disease.

Figure 4 Acute photosensitisation of teats, which is extremely painful



Control and prevention strategies

Prevention of facial eczema is achieved by implementing several strategies during the danger period. High risk periods can be determined by monitoring spore counts for your region in conjunction with local temperature and humidity levels and forecasts.

Current strategies available for control and prevention of facial eczema are:

- Avoid the toxin.
- Suppress the toxin.
- Breed for facial eczema tolerance.

Avoid the toxin

Within regions, farms and even paddocks there can be large variations of spore numbers – individual testing of high-risk paddocks through your veterinarian can help to identify potentially dangerous paddocks which can drive grazing strategies to avoid spore ingestion such as:

- Selectively grazing pastures with known low spore counts in high-risk periods.
- Selectively rotating cows quickly over paddocks with longest grass .
- Avoiding hard grazing if possible.
- Providing alternative feeds during high-risk periods e.g hay, brassica crops.
- Not topping paddocks to minimise the build up of dead litter.

Figure 5 Carefully managing pre- and post grazing heights helps reduce the toxicity of pasture

Supress the toxin/Zinc Supplementation

Supplementing with high levels of zinc is protective for facial eczema and should start 2-3 weeks before the danger period. To be effective, the cow's blood serum zinc levels need to be maintained in the range of 20-35µmol/L. This is most reliably achieved by feeding zinc oxide in pre-formulated pellets at the correct dose rate. Zinc can be toxic at levels that are too high or when moderate levels are in the diet for a long period of time, so zinc supplementation for facial eczema control should be based on high risk periods.

Zinc supplementation of milking cows

Feeding the correct amount zinc oxide in grain/ concentrates in the bail at milking can be very effective for facial eczema prevention. If cows are underdosed (e.g. incorrect rate, settling out of the supplement, competition between cows, large variation in cow weight within a herd) there may be inadequate protection from facial eczema. Blood testing of cows in 12 herds during the 2019 season indicated that protective levels of zinc in the blood was most reliable when zinc oxide is fed in pelleted form. More inconsistent results were achieved when zinc was fed via a mineral dispenser or in a powdered form. It is recommended that farmers consider blood testing 10 cows in their herd 30-40 days after supplementation starts to check zinc levels are at the required level and adjust their program if required.

Experience in New Zealand indicates that accurate zinc supplementation at preventative levels is likely to be safe for up to 100 days. After this point, farmers should have blood testing repeated to minimise the risk of toxicity.

Zinc Supplementation of dry and young stock

Other classes of livestock (e.g. bulls, heifers, calves, dry stock) are also at risk of facial eczema. Whilst it can be harder to ensure these classes of stock are receiving zinc during the high-risk period there are several options available including:

- **Controlled release, intra-ruminal zinc boluses** Commonly used in New Zealand, these boluses are available in Australia under a minor use permit (PER 90370). Unlike oral supplementation of zinc the boluses are effective in reducing the risk of facial eczema soon after being placed in the rumen and so can be used in the face of an outbreak, each bolus provides 30 days protection. Farmers wishing to purchase boluses should contact their veterinary clinic. Veterinarians wishing to source boluses can do so by contacting **Apiam Animal Health**.
- **Zinc Oxide as an oral drench**
- **Zinc Sulphate in drinking water**

For more information on these Zinc supplementation strategies view the 'A review of facial eczema' document on the dairy Australia website. When using zinc for the prevention of facial eczema the two risks which must be managed for all classes of stock are under dosing and therefore not providing protection or zinc toxicity. Zinc toxicity is more common when supplementing Zinc in water or as an oral drench.

Selection for resistant animals

Individual animals within a herd show a wide range of tolerance levels to facial eczema. There is a relatively high genetic component of FE tolerance therefore in the future breeding for FE tolerance may be a promising long-term approach to managing facial eczema.

For further information

Visit the Dairy Australia facial eczema website or contact your regional development office.