

# Facial Eczema

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## Facial Eczema (Pithomycotoxicosis).

Unfortunately there are many livestock owners in New Zealand and around the world who have experienced this serious disease as it affects sheep, cattle, red deer, goats and especially camelids. It is caused by a toxin contained in the spores of the fungus *Pithomyces chartarum*. Although known worldwide, facial eczema is especially common in New Zealand due to the high percentage of toxin producing *P. chartarum* strains as compared to other countries. Alpacas are more sensitive than sheep to this disease, likely due to the lack/absence of selection pressure in their native environment.

After several days of warm humid weather with nighttime temperatures of over 13°C, especially with rain, heavy dews or high relative humidity, the fungus begins growing on the decaying leaves at the bottom of the grass sward [22]. On ingestion, the fungal spores release the mycotoxin sporidesmin into the gut which causes severe liver and bile duct damage. Obstruction of the bile duct may occur which restricts excretion of bile pigments. This results in jaundice and an inability to excrete phylloerythrin (a chlorophyll breakdown product), leading to photo-sensitization of the skin [4]. Consequently, there is severe skin irritation which the animal tries to relieve by persistent rubbing of its head against objects (e.g. fences, trees, etc.). This causes swelling and peeling of the skin, especially around the eyes and on the jaw and ears. There may also be restlessness, frequent urination, shaking, drooping ears, swollen eyes and the seeking of shade to avoid sunlight. Unfortunately, by the time these symptoms have been noted, damage to the liver has already occurred. Veterinary assistance is absolutely essential in assessing and treating affected animals. An initial diagnosis is made based on these symptoms and behaviours but confirmation requires blood testing for  $\gamma$ -glutamyltransferase (GGT) levels.

Sporidesmin often causes permanent liver damage so supportive care is needed for any affected alpaca. They should be kept in the darkest area available and receive pain relief, vitamins for liver support and low protein feeds until there is clear recovery. The consumption of spores causes potentiation and subsequent consumption of small quantities of spores can lead to severe outbreaks.

Prevention of facial eczema:

Spore numbers in the grass swards indicate how toxic it will be if eaten and so counting these is a reliable indicator. There are many commercial and local veterinary services available for determining spore counts in samples taken from paddocks. This video [method](#) shows a method for taking samples. These samples should be taken to a veterinary practice or farm supply business for sending to the testing laboratory. Other local area spore counts may also be available there. Aggregated counts for areas nationwide can be viewed on the [Gribbles Veterinary](#) website during the eczema season. The graphs shown after accessing the lab-portal are real-time and indicate when the spore counts are climbing. Counts in excess of 30,000 spores/g sample are regarded as hazardous to all stock. The image below shows a curve for spore counts over the facial eczema season. The height of the spore counts is usually in March/April though the magnitude and exact timing will vary with seasonal conditions. It should be noted that spore counts are highly variable between farms in the same vicinity, between paddocks at the same farm and even within a paddock. Effectively, this means that local spore counts can be taken as a guide but alpaca owners must time their protective measures to ensure the health of their animals. Protecting your alpacas from this fungus and its spores is critical. There are three main elements to achieving this:

### 1. Preventing growth of the fungus.

- Spraying paddocks with fungicides - ideally, this should be done before the start of the season as the fungicide kills only the vegetative fungus cells and not any spores already produced. Thiabendazole sprays have been shown as effective in controlling sporulation throughout the facial eczema season [21]. Your vet or farm supply store can advise on the appropriate product and application method. Alpacas may graze the sprayed paddock after a number of days as specified in the product description. The treatment provides a level of protection for around 6 weeks, unless there is significant rainfall. Reapplication of the fungicide to each paddock will be necessary and taking samples for spore counts will indicate when the protection is fading.
- The topping of pastures should be avoided as it increases the amount of dead material at ground level in the pasture.

### 2. Reducing exposure to the toxin.

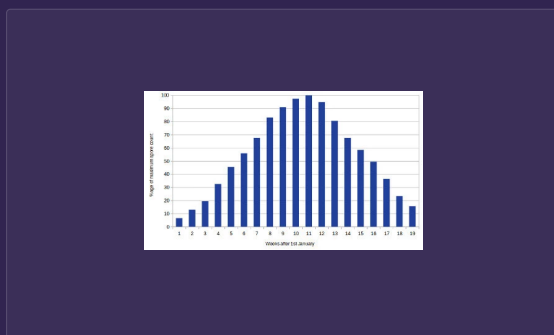
- Stock should be rotated around paddocks with good growth on them and moved on before eating them right down.
- Grazing to low level must be avoided. Paddocks with minimal remaining grass should be closed off until good regrowth has occurred. Heavy rain helps by washing spores into the ground.
- Alternative feedstuffs - these should be freely available during the danger periods, particularly good quality hay, as it reduces the proportion of paddock grazed material.

### 3. Minimising any harm caused by the toxin.

Dosing with zinc. Zinc supplementation is used as an effective prophylaxis against sporidesmin toxicity. Evidence indicates that the toxic effect of sporidesmin is due to its ability to generate the highly reactive superoxide radical. Zinc ions appear to interact with the sporidesmin and prevent superoxide radicals being produced. The incorporation of zinc oxide into alpaca nuts (kibble) is the only practical way of getting an alpaca to consistently consume adequate zinc. Sacks of kibble are widely available from farm stores during the facial eczema season. Putting any zinc salt into the drinking water is ineffective due to the low volume of water drunk per day and the bitter taste of the zinc. Slow release boluses (Time Capsules) should not be used as the alpaca rumen breaks the bolus down rapidly resulting in potentially toxic levels of zinc being absorbed into the bloodstream. Oral zinc sulphate slurries should not be given for similar reason.

In New Zealand, the facial eczema season usually starts in early January. Given that it takes about two weeks for the blood zinc levels to rise to a protective state, the feeding of zinc-containing nuts should begin at New Year. Introduction should be gradual - initially adding some to normal alpaca nuts and steadily increasing the proportion

added over 7-10 days until the correct level is reached. Supplementation with 2g of elemental zinc per 100kg live weight per day is recommended by the feed manufacturers and scientific literature. It should be noted from observations in other ruminant species that excessive consumption of zinc for extended periods of time is known to lead to mild pancreatitis and copper deficiency. Because of this, a maximum period of 100 days is recommended for sheep and cattle. Unfortunately, there are no studies with alpacas into this dosing period so rightly or wrongly, the same recommendation has been followed. It can be seen from the graph that the 100 days of dosing expires during April when spore counts are still elevated so some owners extend this period. The onset and severity of the facial eczema seasons vary so having grass samples tested and keeping a close watch on spore counts is essential. In particularly bad FE years, extended dosing and feed supplementation will be needed - mild but reversible pancreatitis is a better outcome for the alpaca as compared with death through liver failure.



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#### References.

Most of the literature below can be accessed by clicking on the highlighted link. Some links will access the appropriate web page from which the article can be downloaded but others will immediately start downloading the full reference.

4. Boyd, E. (2016). Management of Facial Eczema. *M.Vet. Stud.*, Massey University.

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22. Mitchell, K. J., Thomas, R. G. and Clarke, R. T. J. (1961). Factors influencing the growth of *Pithomyces chartarum* in pasture. *N.Z. J. Ag. Res.*, 4(5-6): 566-577. DOI: [10.1080/00288233.1961.10431614](https://doi.org/10.1080/00288233.1961.10431614)

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