

# Facial Eczema

by Dr Bill Hancock BVSc

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## Causes and Symptoms

Facial eczema (FE) is a disease of sheep, cattle, deer and goats that causes death and lowered production from liver injury, mainly during periods of warm humid weather between January and May. The pasture fungus *Pithomyces charatarum* multiplies and produces spores, which contain the toxin sporidesmin. Sporidesmin causes injury to the liver, the bile ducts become thickened and may be completely blocked. The damaged liver cannot rid the body of wastes and a breakdown product of chlorophyll accumulates in the tissues and causes sensitivity to sunlight. Sunlight causes immediate and severe skin inflammation to exposed parts of the body.

The symptoms of FE therefore can vary from severe photo-sensitisation and in some cases death to sub-clinical effects on the production of meat, wool and milk. In any FE outbreak, many animals with liver damage show no clinical signs - but they suffer from sub-clinical FE.

## Toxic Conditions

For rapid growth and spore formation the fungus needs warm, moist conditions common during the autumn. 4-5mm of rain or even heavy dews in conjunction with 2-4 nights when grass minimum temperatures remain above 12 degrees Celsius are sufficient to initiate rapid increases in spore numbers. Spore counts rise even more rapidly when higher grass minimum temperatures (15-16 degrees Celsius) are associated with high humidity and/or light rain. Generally it takes two or three such "danger" periods before spore numbers reach dangerous levels, each spore rise providing the base for the next increase in spore numbers. However prolonged periods of warm, humid weather early in the season can accelerate the onset of toxic pastures.



## THERE IS NO SUCH THING AS AN UNQUALIFIED "DANGEROUS SPORE LEVEL"

There is no such thing as an unqualified "dangerous spore level". The toxicity of a pasture at any one time depends on several factors.

- The spore count.
- The age of spores in the pasture (old spores are less toxic).
- The grazing intensity and level of the pasture being consumed. (Animals grazing down at the base of the pasture are at most risk).
- Prior exposure of animals to toxic spores (makes them more susceptible).
- The susceptibility of different breeds and species.
- The length of time for which the high level is present and consumed.

Depending on the above factors the level of spores on pasture may prove to be toxic anywhere above 40,000 spores/gram of grass. Long-term ingestion of lower levels of spores may also lead to FE.

Spore numbers can vary within and between paddocks depending on the topography, aspect, altitude and previous management practices. Species vary in their susceptibility to FE. Fallow deer and sheep are most susceptible, followed by dairy cattle, beef cattle and red deer. Most resistant are goats.

# Prevention

Prevention is by management as well as zinc therapy or pasture spraying.

**Beware - we usually face a LONG facial eczema season**

Prevention is based on dosing animals with zinc salts, either zinc oxide as a drench or water treatment with zinc sulphate, or the zinc bolus.

- Dry stock can be dosed at twice weekly or even weekly intervals.
- Zinc dosing can be expected to reduce, but not completely eliminate FE outbreaks.

## CATTLE ZINC DRENCHING

**Long Term Dosing      Stabilised Drench eg Nu Zinc**

Mix 1kg zinc oxide powder (Nu Zinc) with 1 litre of water (if not a stabilised product add 200mls of stabiliser and 800 ml water).

- Mix water and stabiliser first if using.
- Sprinkle powder on the water and leave to settle and wet.
- Stir to a creamy paste.
- **Daily dosing 3.5 mls per 100kg liveweight**
- **3-day dosing 13 mls per 100kgs liveweight.**
- **Weekly dosing 30 ml per 100 kgs liveweight**

**Approximate dose volumes : Long Term Dosing**

Dose intervals (days)		Weight	1	3	7 (Dry cattle only)
			Dose Volume (ml)		
<b>COWS</b>	Jersey	350	13	53	123
	J x F	400	14	60	140
	Friesian	450	16	68	158
<b>HEIFERS</b>	Jersey	300	10.5	39	90
	J x F	330	11.5	43	99
	Friesian	360	12.5	47	108
<b>CALVES</b>	Jersey	130	5	20	45
	J x F	160	6	24	56
	Friesian	190	7	29	67

### Crisis dosing

(dosing only when spore counts are high)

Crisis dosing (without previous long term dosing) gives less protection than long-term dosing and therefore requires higher dose rates to give adequate protection over short periods.

**Stabilised Drenches:**

**5 ml/100kg LWT**

## Motor-driven Drenching Systems

Some motor driven drenching systems cannot be adjusted to the recommended dose volumes. Therefore the drench mixture must be adjusted so that the correct amount of zinc oxide is given.

### Method

Establish the drench volume per cow:

1. Deliver a set number of shots into a measuring jug.
2. Record the total volume.
3. Divide the total volume by the number of shots to get the shot volume,  
e.g. if 10 shots gave 550mls = 550/10 = 55mls per shot.
4. Repeat at least once to confirm the result.

5. Determine the correct zinc oxide dose per cow from the table.

\* Subtract 3mls from drench shot volume to compensate for the volume of zinc oxide e.g. 55ml - 3 = 52ml.

\* Multiply volume and the zinc oxide dose rate by the number of cows e.g. 100 cows x (10g zinc oxide + 52mls water) = 1kg zinc oxide + 5.2 litres water (1kg + 5 litres rounded off).

\* Multiply the daily mix by the number of days e.g. for 20 days = 20kg zinc oxide + 100 litres water.

		Jersey 350 kg	J x F 400 kg	Friesian 450 kg
<b>Long term dosing (daily)</b>	<b>3 g per 100kg</b>	10.5g	12g	13.5g
<b>Crisis dosing (daily)</b>	<b>3.5 g per 100 kg</b>	12.5g	14g	16g

# Prevention continues

## ZINC SULPHATE IN DRINKING WATER

There are four main methods of adding zinc to the drinking water of cattle.

- Using an in-line dispenser to add a concentrated solution of zinc sulphate into the water reticulation system. Important points to remember:
  - Set a level to which you will full the reservoir containing concentrated zinc solution
  - Adjust the dispenser or the reservoir volume to ensure that each day half to two thirds of its solution is injected into the water supply.
  - Calculate the amount of zinc to be added each day (see table). Multiply the dose rate for each class of stock by the number then work out the daily requirement.
  - At the same time each day add the total daily amount of Zinc Sulphate to the concentrate reservoir and then dilute with water to the FULL line. Stir to dissolve the zinc as you fill.
- Adding Zinc Sulphate to a large tank (e.g. 22 000 litres, or 5 000 gals) which supplies the water reticulation system. The Zinc Sulphate is added to a large reservoir tank. The tank must contain at least 100 litres for every cow or cow equivalent. Remember the Zinc Sulphate should be added about the same time each day. Zinc Sulphate should be dissolved in water before adding to the tank.
- Floating trough dispensers (Peta dispensers). Although not as reliable as the first two systems these still appear to give reasonable results and are ideal in situations with smaller numbers
- Direct addition to the water trough - this will only cope with very small numbers of animals.

Note 1. The addition of Zinc Sulphate to the water supply is only suitable to long-term routine dosing - **it is not suited to crisis dosing during danger periods**. Make sure zinc is only distributed to stock. Household and shed water needs to be kept separate. Make sure that livestock do not have access to alternative fresh water during the period that zinc is being added. Addition to the water may be unreliable for treating animals not milking.

2. Mixing of other products in water (eg nutrimol) can reduce effectiveness by settling out the zinc in water lines. This may eventually block the lines and severe FE may result.

### How to Start

Cows should be introduced to increasing zinc concentrations in water over a period of about 3-5 days.

Troughs on the reticulated system in paddocks that have not been grazed should be primed with zinc sulphate at the rate of 1 gram/litre (0.7 gram/litre monohydrate).

There are two forms of zinc sulphate available. Zinc sulphate heptahydrate is the material commonly available. Zinc sulphate monohydrate is a more concentrated form of zinc sulphate and is used at two-thirds the dose rates used for the heptahydrate.

Once calibrated, a volumetric measure is sufficiently accurate for regular use. Weigh out the required zinc sulphate into a plastic bucket. Level the surface and mark the height. Fill the bucket to this level each day.

## CONCENTRATED ZINC SULPHATE SOLUTIONS ARE CAUSTIC. AVOID DIRECT CONTACT AND WEAR PROTECTIVE GOGGLES

Requirements For Zinc Sulphate/Day In Drinking Water

Class of Cattle		Zinc Sulphate Heptahydrate 8g/100kg LW	Monohydrate 5.5g/100kg LW
Friesian cow	450 kg	36	25
F x J cows	400 kg	32	22
Jersey cow	350 kg	28	19
Friesian yearling	275 kg	22	15
Jersey yearling	215 kg	17	12
Friesian calf	190 kg	15	10

**Be sure to strictly follow the mixing instructions with all zinc products, in particular MONO-ZINC, which is always ADDED to WATER and not the water to the powder.**

# Prevention continues

## Pasture Spraying

Please contact us for details on this procedure - how much zinc oxide to use for pasture spraying.  
**Pasture spraying with fungicides is also possible.** Please enquire about this also.



## Plan for a long season, maximum of three capsules can be given.

These are long acting boluses that give good cover in sheep and cattle. There are different sizes depending on the animal's liveweight. **Note new size for small calves.**

There are three calf bolus sizes for 90 - 130kg, 130 - 175kg and 175 - 250kg liveweight, i.e. weaner to yearling cattle, which provide protection for a minimum of four weeks. The cattle bolus for animals 250-400kg has the same length of action. Re-dose in 5th week following initial dosing. **A maximum of three boluses may be given.** Note the minimum weight for bolus application and check liveweight.

The bolus contains zinc oxide in a compacted form and is covered by a wax capsule open at one end. The zinc is slowly released from this capsule to provide the prolonged protection. Damaged or broken capsules cannot be relied on to provide as long a period of protection so care must be taken in handling and administering capsules. They may also give toxic doses of zinc and should be discarded.

These capsules cost \$4.55, \$5.45, \$6.30 and \$9.45 inc GST respectively.



## SUPPLY OF ZINC PRODUCTS FOR THIS SEASON

**Most years there seems to be supply problems with one zinc product or another. In previous years the massive increase in demand for Time Capsules lead to delays in delivery of product from the manufacturer. In other seasons shortages related to drenching and trough products.**

**Supply companies import massive tonnages of product each year. The increase in areas of the North Island affected by facial eczema challenge and the current weather patterns mean supplies may be exhausted far earlier than anyone can anticipate.**

**Zinc is a product that cannot be just sourced and flown in to New Zealand in five minutes.**

**It is false economy to risk buying zinc products only as you need them and we recommend either forward ordering or forward purchasing your requirements based on individual farm history and stock numbers from whoever your retail supplier may be.**

**Cambridge Vet Services can offer a full range of FE prevention products including the Global / Farm-guard range and Time Capsules.**

# Prevention continues

## DEER

Red deer are more susceptible to FE than cattle. Fallow deer are more susceptible than sheep so they need more protection than Reds.

Prevention options include:

- Spraying pastures with fungicide. Regular spraying with fungicides provides the most appropriate control method for preventing FE in deer. Start the spraying programme early while spore counts are low.
- Zinc: the effectiveness and safety of zinc as a prevention has not been researched. If used, dose rates as for sheep (Fallow deer) and cattle (Red deer) should be followed. Because of low water intake, zinc in drinking water is not highly effective but will help in some situations.
- Provide supplementary feed such as hay, silage, meal or crop.



## SHEEP



### Grazing Management

Planned grazing can substantially reduce the risk of FE in hill country. Good planning is essential and it must start months in advance. Identify the safe areas on your farm and aim to have a feed bank on these areas for the FE season. The best way to identify the safer areas on your farm is by regular spore counting over several years - but in the meantime the shady south facing faces are generally safest.

The spores are concentrated in the litter at the base of the pasture so the harder the sheep graze the greater the risk of FE.

Try to minimise the number of young stock retained to late summer and autumn.

### Breeding for Resistance in Rams

Tolerance to FE is strongly inherited so sourcing rams tolerant to FE will reduce the susceptibility of their offspring to FE.



## ZINC OXIDE DOSING FOR SHEEP

Sheep can be dosed at twice weekly, weekly or fortnightly intervals with Zinc Oxide. However the longer the interval, the lower the level of protection. Salmonellosis has been associated with fortnightly dosing so if this is a potential problem shorter intervals are recommended. **Watch for diseases like pink eye and pneumonia, which may also develop due to frequent yarding.**

### RECOMMENDED DOSE RATES:

**Stabilised drench - 0.5ml/10kg LW x interval (days) (recipes for mixing these drenches are in the cattle section).**



### Time Capsule

This is like the cattle product that slowly releases Zinc that gives protection for six weeks in sheep and lambs. It is highly effective and safe in most situations. It dissolves completely in the rumen and therefore leaves no residues. It comes in two sizes one for sheep over 40kg which costs \$2.70 inc GST and one for lambs which costs \$2.10 inc GST. There is only a limited number of these available so contact us as soon as possible if you require some this year. Applicator Guns are available provided the Time Capsules are purchased for Cambridge Veterinary Services for your use - these are charged out at cost and then credited to your account on return to the clinic.



## GOATS

Goats are generally more resistant than sheep, and their browsing habits make them less prone to ingesting spores. Milking goats are probably at greatest risk.

Prevention is best achieved by never making stock graze into the base level of pastures. The fungus grows on the litter at the base of the pasture and the spores are concentrated there.

Other options include:

- Spray pastures with fungicide.
- Use a suitable zinc prevention method. In highly toxic conditions use zinc oxide prevention as for sheep.
- Provide supplementary feed (crops, fodder, hay or silage) to reduce grazing pressure on toxic pastures.

