

Lameness Control in Sheep

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Most outbreaks of lameness in sheep are caused by either scald (interdigital dermatitis) or footrot. Scald and footrot share the same primary cause, the bacterium *Fusobacterium necrophorum* which causes damage to the superficial layer of the skin between the claws and enables the establishment of other bacteria, including *Dichelobacter nodosus*, which causes footrot. The important risk factors for foot lameness are damage to the interdigital skin by exposure to moisture and mechanical trauma.

Scald

Scald is the most common cause of lameness in sheep occurring whenever conditions underfoot are wet. At grass, the incidence is generally greater in lambs than in ewes, but scald can become problematic in housed ewes, when straw bedding becomes wet and warm. In mild cases the interdigital skin is red and swollen and covered by a thin layer of white material. There is no under-running of the hoof wall or sole and no foul smell.

Individual cases of scald can be treated topically using oxytetracycline aerosol sprays. When several animals are affected, walking sheep through a 10% zinc sulphate solution or 3% formalin in a footbath usually provides effective control. It is usually necessary to repeat the foot bathing at weekly intervals throughout the risk period. Afterwards foot bathing sheep must stand in a dry area so that the formalin or zinc sulphate can dry on the feet. At concentrations greater than 5%, formalin can cause severe irritation of the interdigital skin. The practice of regularly replenishing footbaths with a few splashes of concentrated solution should be avoided.



Fig 1: Many outbreaks of lameness in lambs are caused by scald



Fig 2: In scald, the interdigital skin is red and swollen and covered by a thin layer of white material.

Footrot

Footrot is an extremely painful disease and affected animals lose weight rapidly. Animals with virulent footrot are very lame, remain recumbent for long periods and may carry the affected leg. When both forelimbs are affected, animals walk on their knees. The first sign of footrot is swelling and moistening of the interdigital skin. A break occurs at the skin horn junction from where infection spreads under the horn tissue so that the wall of the hoof becomes separated and the sole under-run. There is a characteristic foul-smelling discharge. In chronic cases, the hoof walls and toes become overgrown and misshapen, trapping dirt and inflammatory exudate between the inflamed, granulating soft tissues of the sole and overgrown horn. Affected feet may be flystruck.



Fig 3: Footrot where infection spreads under the horn tissue so that horn becomes separated and the sole under-run

Control

Various methods can be employed for the control of footrot -

- foot bathing
- foot trimming
- antibiotic injections
- vaccination
- selection for resistance

- eradication

In practice, footrot control is based on a combination of the above.

It is important to distinguish between those methods which are useful for treating severely affected sheep, such as trimming and parenteral antibiotics, and those which will help control disease when used correctly, such as foot-bathing and vaccination.

Footrot control utilises whole-flock control strategies such as foot-bathing and vaccination from the start of the high risk periods for disease transmission, rather than individual handling of each affected animal in order to treat advanced cases.



Fig 4: Footrot infection spreading under the horn tissue so that horn becomes separated from the sole.



Fig 5: Hoof trimming exposing the under-run sole and hoof wall as part of the treatment protocol in uncontrolled cases of virulent footrot.

Footbathing: Application of antibacterial solutions in a foot bath is most effective for the control of footrot when practised during the early stages of the disease, when infection in previously unaffected sheep is limited to the interdigital skin and does not involve the hoof wall (see foot bathing method above described for scald). Foot bathing usually needs to be repeated at fortnightly intervals during warm and wet weather when the risk of transmission is high, but when weather conditions are dry such treatment achieves a high cure rate. Foot bathing alone is not particularly effective for the treatment of advanced footrot lesions.

Foot trimming: Traditionally routine annual foot trimming has been recommended for the control of footrot. However, foot trimming has no role in preventing infection and should not be considered as a preventive method when planning control programmes. Hoof trimming is only useful to limit the effect of the disease and assist in the resolution of the lesion after the infection has under-run the sole and hoof wall in uncontrolled cases of virulent footrot.

The injection of high doses of penicillin can be useful for the treatment of advanced cases of virulent footrot where there is severe under-running of hoof horn.

Vaccination can be a useful adjunct for both control and treatment of footrot. Vaccination provides protection against infection for about 4 - 6 months. In some cases a single dose of vaccine administered in the face of an outbreak can be used to reduce the severity of the disease. The net effect of vaccination can be to reduce both the prevalence and severity of footrot in the flock. However, whole flock vaccination alone does not eradicate footrot and can prove expensive. In many flocks, vaccination is targeted at specific high-risk groups of animals, such as rams before mating.

Contagious ovine digital dermatitis



Fig 6: Under-running of the hoof wall from the coronary band towards the toe causing detachment then shedding of the horn capsule in this case of CODD.



Fig 7: The damage to the corium may be so severe in CODD that re-growth of the horn is permanently affected.

Contagious ovine digital dermatitis (CODD) is an apparently new, severe condition first described in 1997. The isolation of spirochaetes resembling

those involved in digital dermatitis in cattle from some, but not all, suspected clinical cases in sheep has led to the adoption of the current name. The characteristic clinical picture is a primary lesion at the coronary band of the outer wall with subsequent invasion and under-running of the hoof wall from the coronary band towards the toe causing detachment then shedding of the horn capsule. Sheep show severe lameness affecting one digit of one foot in most animals but both digits of one foot in some sheep. The damage to the corium may be so severe that re-growth of the horn is permanently affected. Typically, there is also loss of hair extending 3-5 cm above the coronary band. There is no interdigital skin involvement.

Control

Control depends on purchasing all sheep from known sources and/or health status to reduce the risk of infection, isolation of all purchased sheep for at least 30 days, regular inspection of all purchased sheep during the quarantine period, and the isolation of any sheep found to be lame and prompt treatment with a suitable antibiotic recommended by your veterinary surgeon.

Treatment

Tilmicosin is claimed to be more effective than oxytetracycline during the acute phase of CODD. Veterinary administration of tilmicosin should ensure accurate diagnosis of CODD on clinical examination but it is equally effective, although more expensive, for virulent footrot.

No antibiotic is licensed for use in footbaths but lincomycin and tylosin have been used.

Toe Fibroma/granuloma

Toe fibromas most commonly result from overzealous foot paring with exposure of the corium and excessive use of formalin footbaths. Toe fibromas can occur in association with virulent footrot where horn lysis results in exposure of the corium. This condition can be resolved by careful foot paring with excision of the growth and application of a pressure bandage to the affected area.



Fig 8: Toe fibromas most commonly result from overzealous foot paring with exposure of the corium and excessive use of formalin footbaths.

White line abscesses

Abscess formation arises following bacterial entry into the white line area, commonly at the toe, which may extend to discharge at the coronary band. Release of pus by careful foot paring with removal of all under-run horn. The corium should not be exposed as this results in delayed healing and may result in granuloma formation.

Septic pedal arthritis



Fig 9: Sheep with infection of the distal interphalangeal (pedal) joint show severe lameness. The foot is swollen with obvious widening of the interdigital space.



Fig 10: Digit amputation gives excellent results with sheep remaining sound for the remainder of their productive lives in most cases.

Bacterial infection usually gains entry to the distal interphalangeal (pedal) joint within the hoof capsule via an interdigital lesion which then tracks to discharge above the coronary band.

Affected sheep show severe lameness. The foot is swollen with obvious widening of the interdigital

space and a discharging sinus(es) above the coronary band on the abaxial aspect of the hoof wall. Antibiotic therapy is useless in these cases. Digit amputation gives excellent results with sheep remaining sound for the remainder of their productive lives in most cases.

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