

# Nervous Disease in Sheep

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## Listeriosis

Listeriosis is primarily a winter-spring disease, most commonly but not exclusively, associated with silage feeding. Disease is caused by *Listeria monocytogenes*, a bacterium that lives in a plant-soil environment. The less acidic pH of spoiled silage (pH >5.0) enhances multiplication of *Listeria monocytogenes*. The number of sheep clinically involved in an outbreak is usually less than 2 per cent but, in exceptional circumstances, may reach 10 per cent in a flock. Outbreaks occur around 14-21 days after feeding poor quality silage, whilst removal or change of silage in the ration often halts the appearance of listeriosis but cases can still occur for a further two weeks or so.

Listeriosis –typical farm occurrence includes:

- Sheep aged 18 to 24 months
- Poorly-conserved/stored silage
- Outbreaks affects 2 per cent of sheep; rarely much higher incidence
- 14-21 days after silage feeding commences

## Clinical presentation

Bacterial infection is limited to one side of the brain in most animals; hence the one-sided appearance of nerve paralysis. Initially, affected animals do not eat/come to the feed trough, are depressed, disorientated and may propel themselves into corners, into fences, or under gates and feed troughs etc.



**Fig 1: Initially, affected animals are depressed and disorientated.**



**Fig 2: This sheep propelled itself into the corner of the fence – it is not stuck.**



**Fig 3: Affected sheep may propel themselves into corners, into fences, or under gates and feed troughs**

Affected sheep may lean against objects due to weakness affecting one side of body, with knuckling of the foreleg. There is profuse, almost continuous, salivation with food material impacted in the cheek of the affected side. There is a drooping ear, deviated muzzle, flaccid lip and lowered eyelid on the affected side.



**Fig 4: Drooping ear, deviated muzzle, flaccid lip on the affected left side of this sheep.**



**Fig 5: There is profuse salivation.**

**Listeriosis – clinical signs may include:**

- Not eating
- Depressed, disoriented
- Propel themselves into corners, into fences, under gates and feed troughs
- Lean against objects
- Profuse salivation
- Food material impacted in the cheek of the affected side
- Drooping ear, deviated muzzle, flaccid lip on the affected side
- Lowered eyelid on the affected side



**Fig 6: Sheep may lean against objects.**

**Differential diagnoses**

Your veterinary surgeon may also consider the following diseases:

- Pregnancy toxæmia in heavily pregnant ewes during the last four weeks of pregnancy.
- Peripheral vestibular lesions (middle ear infections)
- Brain abscesses
- Gid (coenurosis, tapeworm cyst in the brain)

**Diagnosis**

Diagnosis of listeriosis is based upon a thorough veterinary examination.

**Treatment**

Recovery of sheep from listeriosis depends on early detection of illness by the shepherd, together with prompt and aggressive antibiotic treatment prescribed by the veterinary practitioner. High doses of antibiotic are required to achieve appropriate concentrations within brain tissue to kill the bacteria. The overall recovery rate in sheep can be up to 30 per cent when sheep are presented early in the clinical course.



**Fig 7: Sheep recovering from listeriosis.**

Propylene glycol, or a concentrated oral rehydration solution containing dextrose, should be administered as per the manufacturer's data sheet to prevent development of a severe energy deficit and the possibility of pregnancy toxemia. Fresh palatable foods and clean water must always be available. A topical antibiotic eye ointment should be applied twice daily.

### Control

Outbreaks occur more than 10 days after feeding poor quality silage. If silage is being fed, use of that particular silage should be discontinued whenever possible. Spoiled silage should be discarded routinely or fed to growing cattle because of their much lower risk of disease. Clean feed troughs daily and discard refusals

Silage feeding:

- Discard spoiled silage (or feed to cattle)
- Clean feed troughs daily
- Avoid soil/manure contamination of feed troughs from tractor wheels etc.
- Discard refusals
- Clean water troughs regularly
- Repair punctured wrapped bales immediately

The use of additives for grass silage is likely to produce a more acid pH which discourages multiplication of *L. monocytogenes*. Silage clamps must be rolled continuously during filling then sheeted to prevent entry of air. A block cutter operating along a short silage face limits air entry and secondary fermentation once the clamp has been opened. Every effort must be taken not to puncture wrapped silage bales during handling and storage, with all punctures sealed immediately. Stores of wrapped silage bales must be fenced against farm stock and vermin.

### Silage making:

- Use silage additives
- Silage clamps must be rolled continuously
- Silage clamps must be sheeted to prevent entry of air
- Use a block cutter
- Cut across a narrow silage face
- Seal punctures immediately
- Fence against farm stock and vermin



**Fig 8: Seal punctures immediately.**



**Fig 9: Do not leave bales unwrapped for days before feeding.**



**Fig 10: Discard spoiled silage (or feed to cattle).**

## Polioencephalomalacia (Cerebrocortical necrosis CCN).

### History

Polioencephalomalacia (PEM) is most commonly seen in weaned lambs aged 4 to 8 months but disease does occur in adult sheep. Individual lambs are usually affected approximately two weeks after movement to another pasture or other dietary change. During the early stages of PEM affected sheep are blind and become isolated from the group and may wander aimlessly. There is 'star-gazing' when stationary. The condition deteriorates within 12 to 24 hours to lateral recumbency with seizure activity during handling. Without treatment, death follows within 3 to 5 days in untreated sheep.



**Fig 11: During the early stages of PEM affected sheep are blind and become isolated from the group.**



**Fig 12:** During the early stages of PEM affected sheep are blind and become isolated from the group.



**Fig 13:** There is 'star-gazing' when stationary.



**Fig 14:** The condition deteriorates within 12 to 24 hours to lateral recumbency with seizure activity

### History

- weaned lambs aged 4 to 8 months but occasionally adult sheep
- pasture or other dietary change

### Clinical signs

- blind
- become isolated
- wander aimlessly
- 'star-gazing'
- recumbency with seizure activity

### Diagnosis

Diagnosis is based upon veterinary examination.

### Treatment

The treatment response during the early clinical stages of PEM to high doses of thiamine, (10 mg/kg bid) administered intravenously for the first occasion, is generally good. Successfully treated sheep are able to stand and commence eating within 24 hours although normal vision may not return for 5 to 7 days. Treatment should be continued for three consecutive days.

- Intravenous thiamine (vitamin B<sub>1</sub>)
- Three consecutive days' treatment



**Fig 15:** The treatment response during the early clinical stages of PEM is generally good (see below).



**Fig 16:** The same sheep as above after treatment.

## Coenurosis (Gid)

Coenurosis is an uncommon disease of sheep although it still occurs in certain geographical areas. Treatment of farm dogs with appropriate anthelmintics and correct disposal of sheep carcasses, have all combined to break the sheep/dog cycle.

*Coenurus cerebralis* is the larval stage of *Taenia multiceps*; a tapeworm which infests the small intestine of dogs. Contamination of pastures grazed by sheep with dog faeces can result in larval invasion of the central nervous system forming a cyst in the brain and clinical disease. The life cycle is completed when the carnivorous definitive host ingests infested sheep's brain.



**Fig 17: Correct disposal of sheep carcasses, helps to break the sheep/dog cycle.**

### Clinical presentation

Chronic coenurosis is more commonly reported in growing sheep aged 6 to 18 months where the signs develop slowly and progressively. Compulsive circling behaviour is commonly observed. Depression and head-pressing behaviour may also occur.



**Fig 18: Compulsive circling, head pressing and depression are common signs**

### Treatment

Many farmers may elect to slaughter those sheep fit for marketing for economic reasons although a 85 per cent surgical success rate for removal of the

coenurus cyst can be achieved. Recovery after successful surgical cyst removal is rapid and there is a return to full neurological function within one week.

### Management/Prevention/Control measures

Control of coenurosis can be effected by regular dosing of farm dogs at 6 to 8 week intervals with an effective taenicide (praziquantel) and correct disposal of all sheep carcasses to prevent scavenging by dogs belonging to the general public which may not receive regular anthelmintic treatment. Foxes are not considered to be an important definitive host of *T multiceps*.

### Economics

While the recovery rate following removal of a cyst is good, the poor clinical condition of the sheep at presentation to the veterinary surgeon and low financial value relative to the cost of general anaesthesia cause most farmers to slaughter those sheep fit for marketing for economic reasons, and euthanase those in poor condition.

## Vestibular disease (middle ear infections)

Unilateral peripheral vestibular lesions are commonly associated with middle ear infections and ascending infection of the eustachian tube

### Clinical presentation

Sheep with vestibular disease typically present with a head tilt towards the affected side and loss of balance such that they may fall over when stressed.



**Fig 19: Sheep with vestibular disease typically present with a head tilt towards the affected side and loss of balance**

### Treatment

A good treatment response is achieved with 5 consecutive days' treatment with procaine penicillin when the disease is recognised during the early stages.

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