

## Gastrointestinal Nematode Infestations in Sheep

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Gastrointestinal nematode infestations are perhaps the most important group of conditions limiting intensive sheep enterprises. The important nematode infestations are

- nematodiosis in young lambs during the late spring /early summer,
- parasitic gastro-enteritis of growing lambs from mid-summer onwards
- older sheep when control measures fail to be implemented correctly.



***Parasitic gastro-enteritis affecting growing lambs from mid-summer onwards***



***Emaciation caused by failure to control PGE.***

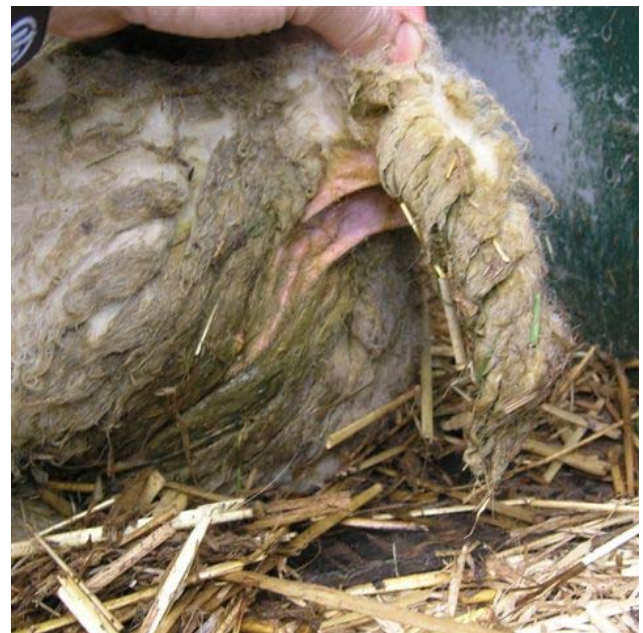
### **Nematodiosis**

In the UK nematodiosis is an important disease affecting young lambs during the late spring /early summer months when losses can be high.



***Nematodiosis is an important disease affecting young lambs during the late spring /early summer months.***

Sudden death and outbreaks of diarrhoea in surviving lambs can occur in young lambs grazing pastures contaminated with large numbers of larvae which develop from eggs deposited by lambs during the previous grazing season.



***Sudden outbreak of diarrhoea in lambs caused by nematodiosis occur in young lambs grazing pastures contaminated with large numbers of infective larvae.***



**Sudden deaths are not uncommon from nematodiosis in severely affected lambs.**



**Only lambs are affected with nematodiosis, ewes do not show disease.**

Only lambs are affected, ewes do not show disease. There is acute onset of profuse watery diarrhoea in young lambs with faecal staining of the wool of the tail and perineum. The lambs are dull and depressed and rapidly develop a gaunt appearance with obvious dehydration and condition loss. If left untreated during the early stages of disease, deaths occur from dehydration and there is considerable weight loss in the remaining lambs. It is not unusual with severe larval challenge for 5 per cent of lambs to die within a few days.

Convalescence following anthelmintic treatment is protracted with affected lambs taking much longer to achieve market weight -

#### **Treatment**

Sheep should be moved from infested pastures whenever possible. Anthelmintic resistance is not a problem with *N. battus*.

#### **Management/Prevention/Control measures**

Prevention is based upon avoidance of pastures grazed by lambs during the previous grazing season because adult sheep are highly resistant to infection and only lambs produce significant numbers of eggs.

Anthelmintic prophylaxis timing is guided upon environmental temperatures and disease forecasts. Typically, for lambs born from mid-March onwards in "normal risk" years anthelmintic treatments are given three weeks apart during May. In "high risk" years, three anthelmintic treatments are given extending the drenching period into June.

## **Parasitic gastro-enteritis**

This section deals in general terms with parasite control in the UK. This is a rapidly changing area of veterinary medicine, especially following the introduction of a fourth group anthelmintic, monepantel (designated 4-AD)

### **Clinical presentation**

Infestations usually cause

- profuse diarrhoea
- reduced performance
- weight loss
- emaciation in some cases
- anaemia in some cases

The important worms are:

Nematodiosis (which has been described above)

- *Teladorsagia* (formerly *Ostertagia*)
- *Haemonchus contortus*
- *Trichostrongylus*

*Haemonchus contortus* is becoming a serious threat to intensive sheep production throughout the UK and not just south-east England.



***In haemonchosis the most important clinical sign is anaemia.***

The severity of clinical signs of parasitism depend upon

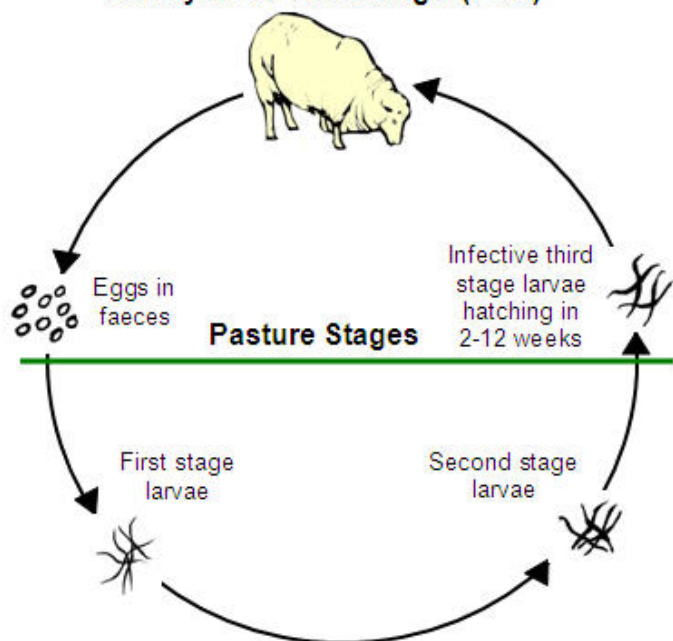
- age of the sheep,
- current nutritional status especially protein intake,
- immune status,
- trace element status
- breed (genetic factors)

The classical signs of parasitic gastro-enteritis are observed in growing lambs exposed to large numbers of infective larvae during warm summer months.

### **Teladorsagiosis**

Disease is typically seen in growing lambs with profuse watery diarrhoea during mid/late summer causing dehydration and reduced weight gain/condition loss.

### Life-cycle of Teladorsagia (PGE)



#### Haemonchosis

As a consequence of its blood feeding, haemonchosis presents with anaemia, submandibular oedema, and increased heart and respiratory rates; diarrhoea is not a feature of this nematode infestation. Ingestion of large numbers of larvae over a short period of time causes acute disease with lethargy, weakness, and rapid loss of condition. This form of the disease is more commonly seen in growing lambs. Ingestion of smaller numbers of infective stages over several weeks to months causes a more general loss of condition progressing to emaciation.



*Haemonchosis typically presents with anaemia and submandibular oedema.*



*Haemonchosis in a Suffolk shearling - ingestion of large numbers of larvae over a short period of time causes acute disease with lethargy, weakness, and rapid loss of condition.*



*Diarrhoea is not a feature of haemonchosis.*

#### Trichostrongylosis

Disease is normally seen during early winter, usually affecting 8 to 10 month-old lambs but also yearlings and adult sheep. The most prominent clinical feature is profuse dark-coloured, foul-smelling diarrhoea with much mucus present in the worst affected sheep.



*Trichostrongylosis is normally seen during early winter affecting 8 to 10 month-old lambs*



***Trichostrongylosis affecting a Scottish halfbred hogg during early winter.***

## **Diagnosis**

### ***Teladosagiosis and Trichostrongylosis***

Faecal egg counts are routinely used to aid diagnosis of nematode infestations but have certain inherent limitations. Due to numerous factors the faecal egg count may not accurately indicate the adult nematode population present within the gastrointestinal tract at that time. Pathology can be caused by developing larval stages before infestations become patent and produce, and also by arrested (hypobiotic) stages.

By identifying only strongyle eggs, it is possible for less pathogenic species to make a disproportionate contribution to the total egg count. As a general rule strongyle egg counts above 400 epg are considered moderate while greater than 1,000 epg are considered high and worthy of treatment. Your veterinary surgeon is the best person to guide you on your own farm situation.

### ***Haemonchosis***

Identification of anaemia is taken as a reliable indicator of haemonchosis in countries with endemic disease. Egg counts are often very high in patent infestations with counts greater than 10,000 epg not uncommon. At necropsy very large numbers of adults are visible on the surface of the abomasum (fourth stomach compartment) of untreated sheep.

## **Treatment**

Treatment involves the use of an effective anthelmintic (please see later section detailing anthelmintic resistance).

The four major anthelmintic groups, defined by the active chemical, comprise:

- 1-BZ benzimidazoles, probenzimidazoles
- 2-LM imidazothiazoles, tetrahydropyrimidines
- 3-AV avermectins, milbemycins.
- 4-AD monepantel

Benzimidazoles such as albendazole and fenbendazole have a similar mode of action. Febantel, netobimin and thiophanate are probenzimidazoles which are converted to benzimidazoles in the body.

Levamisole and tetramisole are imidazothiazoles. Morantel and pyrantel are tetrahydropyrimidines.

Preparations for sheep that contain avermectins include doramectin and ivermectin, and milbemycins such as moxidectin.

Closantel and nitroxynil can be used in situations where *H. contortus* is the major parasite.

It is essential that:

- a representative number of sheep are weighed before treatment,
- treatment is based upon the heaviest sheep in the group,
- drenching equipment is accurately calibrated.

These points are emphasised in Sustainable Control of Parasites in Sheep (SCOPS).

## **Management/Prevention/Control measures for parasitic gastro-enteritis**

### **Management**

With traditional management of sheep on permanent pasture in the UK, parasitic gastro-enteritis in growing lambs results from ingestion of very large numbers of infective larvae from pasture during mid-summer. *Teladosagia circumcincta*, and in warmer areas *Haemonchus contortus*, larvae appear first with *Trichostrongylus spp.* during mid summer.

Pasture larvae arise from two sources:

Eggs passed by ewes during the periparturient period. The reduction in host immunity permits a significant increase in egg production during the last two weeks of gestation which may persist until eight weeks post lambing. Under suitable environmental conditions these eggs develop to infective larvae within three weeks but maximum levels may not be present on pasture for up to six weeks. These larvae are the major source of infestations in young lambs.

Young lambs may also ingest over-wintered infective larvae, - which develop to adults-, from pasture. The large numbers of eggs produced by these adult nematodes resident in the gastro-intestinal tract of young lambs results in the appearance of significant numbers of infective larvae on pasture during mid-summer. Clinical parasitism results unless appropriate action is taken.

### **Control**

Control is based upon not grazing potentially heavily-infested pastures with susceptible lambs. Avoidance of infested pastures from July onwards can be integrated into some farm management systems by moving sheep onto hay or silage aftermaths during mid June onwards. On some mixed farms, it may be possible to rotate pastures annually between cattle and sheep and operate a "modified" two year clean grazing system.

Anthelmintics can be administered to both ewes and lambs to prevent the build-up of critical larval populations on continually-grazed pasture but this may not be sustainable because of the development of resistance.

### **Use of prophylactic anthelmintics**

Anthelmintic treatment to prevent the periparturient rise in egg output by ewes can be given at various times depending upon farm management system such as when housing ewes during mid gestation, at the same time as vaccination against the clostridial diseases four to six weeks prior to lambing, or immediately prior to turnout to pasture when lambs are one to two days-old.



***Anthelmintic treatment can be used to prevent the periparturient rise in egg output by ewes.***

It is important that the anthelmintic chosen to counter the peri-parturient rise is effective against arrested larval stages. To gain maximum benefit from the residual activity of moxidectin, ewes should be drenched/injected at turnout to pasture with their lambs rather than at housing affording up to seven to 11 weeks' residual action, respectively. The importance of good ewe nutrition during early lactation should not be underestimated with respect to parasitic gastro-enteritis.

The timing of early season prophylactic anthelmintic administration to control nematodiosis has been discussed above but essentially comprises a strategic anthelmintic drench(es) depending upon disease forecasts. While such forecasts are reasonably accurate, local factors may operate such that two drenches are given two weeks apart from early May – your veterinary surgeon will advise regarding local conditions.



***Advice regarding early season prophylactic anthelmintic administration to control nematodiosis will be given by your veterinary surgeon.***

Traditionally, where lambs graze permanent grassland, anthelmintic treatments were repeated every month until the autumn but the interval will depend upon the persistence of the particular anthelmintic. Grazing heavily contaminated pasture with reliance upon chemical prophylaxis/treatment is unsustainable and lambs fail to grow to their potential under such mis-management. A more integrated pasture management policy is undoubtedly overdue on most intensive sheep farms in the UK – again consult your own veterinary surgeon as to how this goal can be best achieved on your farm.



***A more integrated pasture management policy is overdue on most farms - consult your own veterinary surgeon as to how this goal can be best achieved on your farm.***



***Consult your own veterinary surgeon regarding quarantine drenching.***



***What is the best strategy for this farm – individual farm sustainable PGE control measures will be drafted by your own veterinary surgeon***

## Tapeworm infestations

While segments of tapeworms are often seen in the faeces of growing lambs in the UK they exert no adverse effects on growth rate. Treatment is not

considered necessary because tapeworms are non-pathogenic. Only members of the benzimidazole group (1-BZ) are effective against adult tapeworms.

To test your knowledge and understanding of the control of this condition, try our instantly marked self assessments, by clicking here

**Health Quiz**

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