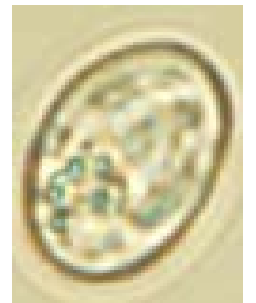


Cyst-like lesions in lamb muscle tissue – enough to put you off your dinner

O'Shaughnessy J.¹, Tizard S.¹, Casey M.¹, Gutierrez M.², O'Riordan N.²,
Delaney S.², O'Rourke J.¹, Fallon R.¹, Farrell L.¹, Byrne W.¹

¹Central Veterinary Research Laboratory, Backweston, Celbridge, Co. Kildare, Ireland;

²Veterinary Public Health Regulatory Laboratory, Backweston, Celbridge, Co. Kildare, Ireland



NRL for Parasites in Ireland Functions

- Auditing of *Trichinella* testing in approved laboratories
- Organisation of proficiency trials for *Trichinella* testing for approved Irish laboratories
- Participation in EURLP organised proficiency trials
- Surveillance of Irish foxes for *Echinococcus multilocularis* to meet the requirements of Regulation (EU) No 1152/2011
- Routine diagnostic testing
- Investigation service

Disease outbreak sees over 400 lamb carcasses destroyed



Contact us
E-mail: editor@farmireland.ie
Telephone: 01-7055719



ADVERTISEMENT

It is understood the outbreak has been linked back to the Donegal region. Gettyimages

ing
ole-



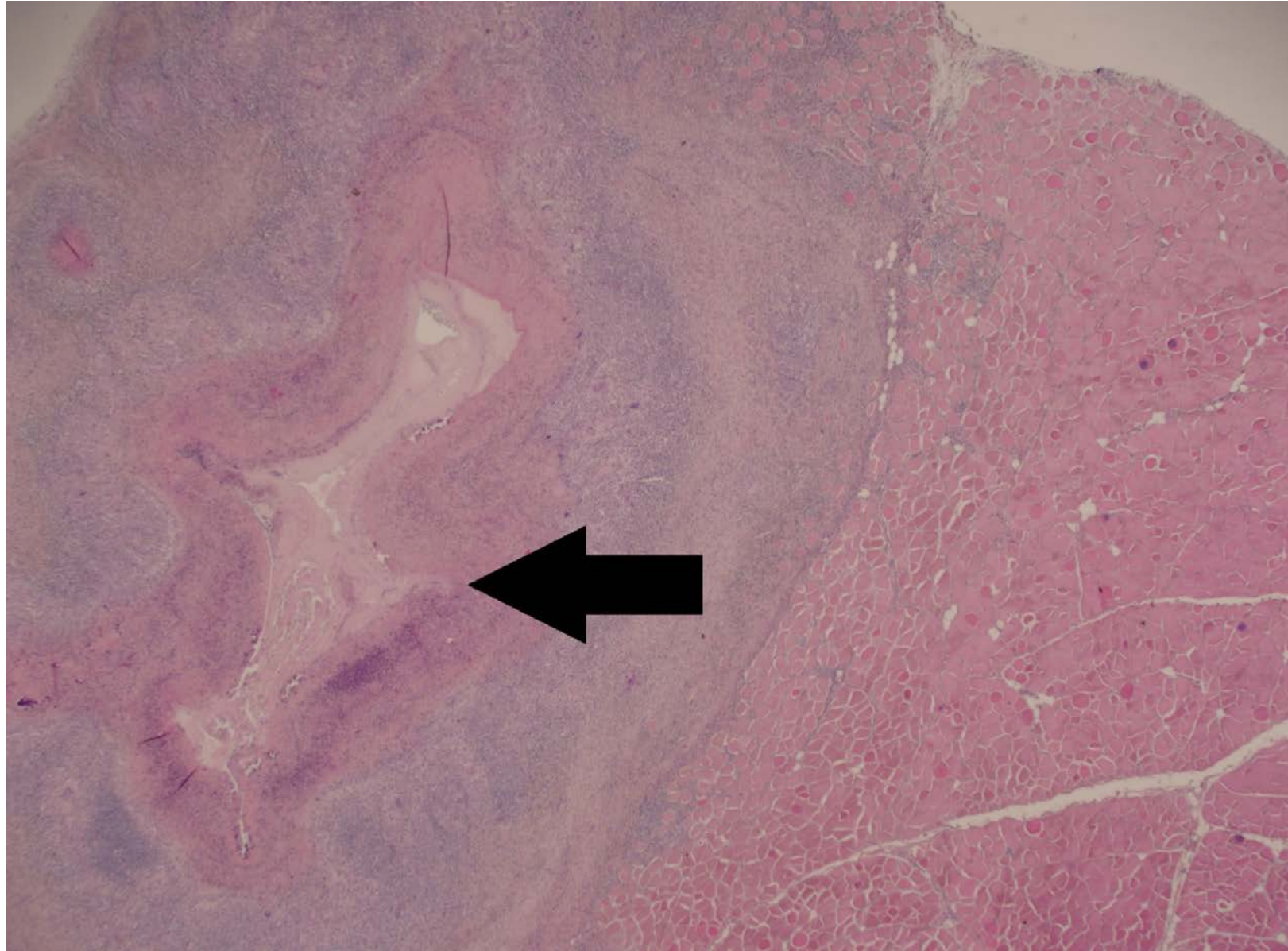
Diagnostics

- 28 samples (mainly cardiac muscle) submitted for testing

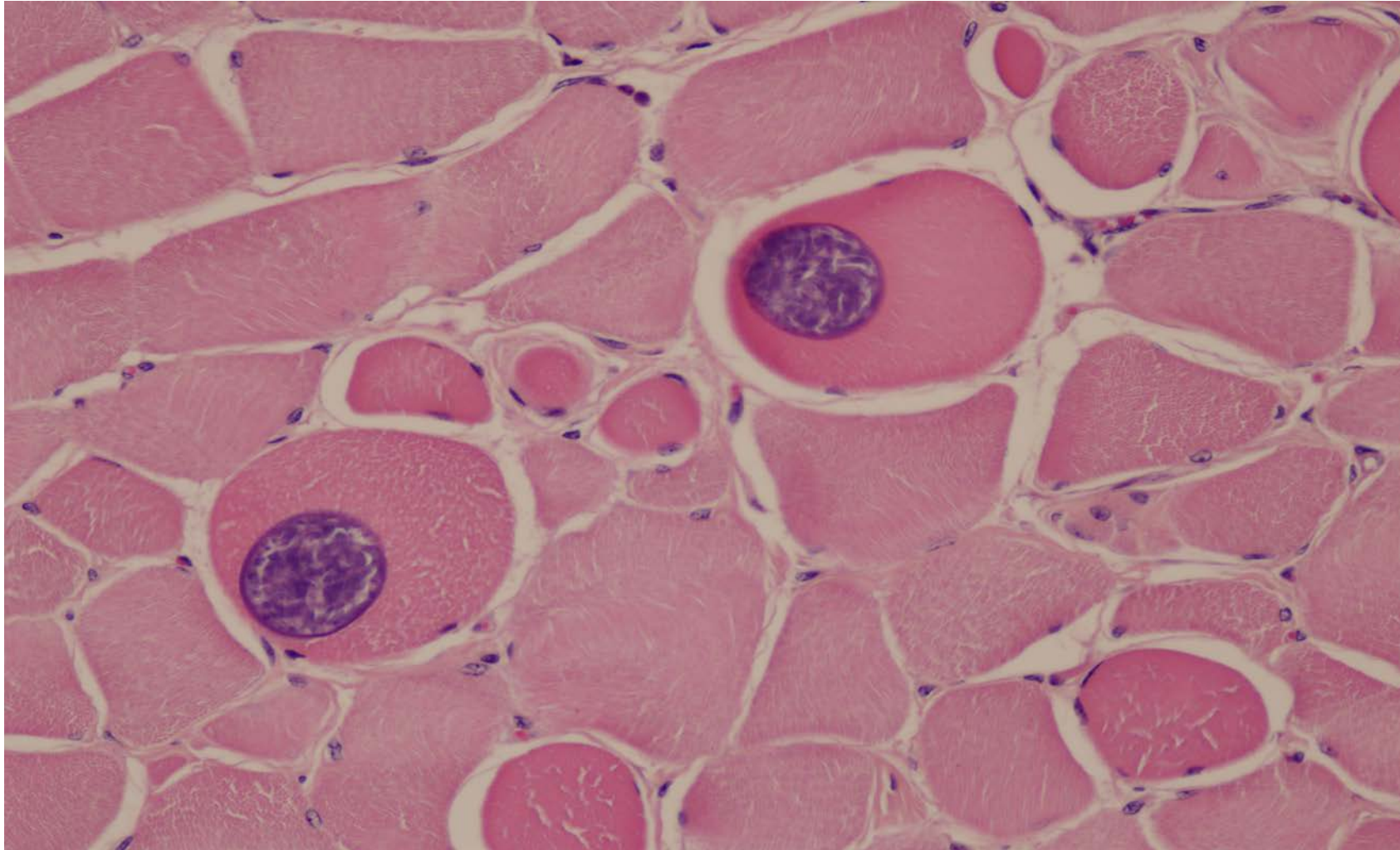
Histopathology

- Multiple representative samples from lesions fixed in buffered formalin
- Fixed samples were trimmed and prepared to include lesions and grossly normal tissue in the same section
- Samples were processed and stained with haematoxylin and eosin
- Slides were examined using light microscopy by the same pathologist

Degenerating cestode cyst (arrow) surrounded by a large area of granulomatous inflammation



Intracellular protozoal cyst in sheep muscle



DNA Extraction and Subsequent Analysis

- DNA was extracted according to the TissueLyser Handbook and QIAamp DNA Mini Kit (Qiagen)
- **Extracts tested**
 - Taeniid species - multiplex PCR technique (Trachsel, Deplazes and Mathis, 2007)
 - *Sarcocystis* spp. - 18S rRNA gene was amplified using primers Sar-F1 Forward and Sar-R1 Reverse (Bahari *et al.*, 2014)
- **Results**
 - *Taenia ovis* and *Sarcocystis tenella* identified in 23 and 22 samples, respectively
 - 19 samples positive for both *S. tenella* and *T. ovis*
 - Only two samples negative for the presence of both parasites

Farm Visit

- To review controls in respect of known risk factors for both conditions
- Provide subsequent recommendations for their control
- To gain a better understanding of this enterprise type

Farm Details

- 32 hectare sheep and beef suckler enterprise
 - Flock of 200 March/April lambing ewes lamb
- Buys and fattens **10,000** lambs and **1,500** culled ewes per year
 - Mostly purchased at public auction/marts
- Most finished indoors (proprietary mix, no forage)
 - Lambs batched and some are finished at grass (no concentrates)
- 2 dogs on farm and “visiting feral” cats



The shed

- 16 pens
 - 100 sheep per pen
- All sheep dosed monthly with anthelmintics

- Sheep farming in Ireland
 - 3.8 million sheep
 - 35,777 flocks
 - Average flock size of 108 sheep



Feed Store



Feed Store



Temporary Carcass Storage Facility



Entry To Sheep Pens



Farm Movement Records

- Did the farm act as a sole source of infection??.....difficult to know
 - Risk factors present....but..
- Current paper-based sheep movement recording system makes investigations difficult



Other Visit Findings of Concern

Sheep Scab



All concentrate diet

Also concerns over the prevalence of lameness and respiratory disease



Recommendations

For the Control of Sarcocystosis and Cysticercosis

- In a sheep intense area where this farm is located, the frequency of worming treatments of farm dogs should be increased to six to eight week intervals to reflect the prepatent period of the tapeworm involved (Deplazes et al., 2016). It is imperative that the wormer used is effective against tapeworms (e.g. fenbendazole- or praziquantel-based products such as *Bob Martin Easy to Use Wormer Granules for Large Dogs*, *Drontal Tasty Bone Wormer 150/144/50 mg tablets*). Veterinary advice should always be sought when identifying a suitable worming product as some products are not suitable for use in dogs in early- to mid-pregnancy.
- All carcasses are to be immediately disposed of in a properly secured bin. It is recommended that carcasses are collected from the farm with a carcass collection frequency of twice a week. It is important to also state that raw meat or offal is not to be fed to dogs.
- Ensure both the concentrate feed storage shed and feed bunkers in the slatted shed cannot be accessed by farm dogs, cats or foxes.
- The farmer should keep a record of all sheep that are sent for slaughter where suspected lesions of the intermediate stages of either *Sarcocystis* or *Taenia ovis* are reported. These records should be reviewed with his veterinary surgeon/consultant to assess the success of the implemented control measures.
- This feedlot should require their livestock suppliers to also have key control measures in place as outlined above.

Additional Recommendations

- The feedlot should as a minimum use management tags, colour-codes or spray marker numbering or otherwise so that sheep can easily be traced back to the farm of origin.
- A Teagasc advisor and/or nutritionist should be consulted on best feeding practices for sheep in this type of finishing system given that at present the diet does not contain any source of long-stem forage.
- It is recommended that the farmer's veterinary surgeon/consultant develops a written farm herd health plan. This plan must be reviewed and updated by the consultant following the completion of an annual visit to the farm, of no less than

Conclusions

- Many flock health issues identified
- The need for flock health planning in enterprises of this scale is clear
 - On-going veterinary & nutritionist input
- Need to revise treatment protocols for dogs in sheep-intense areas
- An electronic sheep identification system would help these investigations

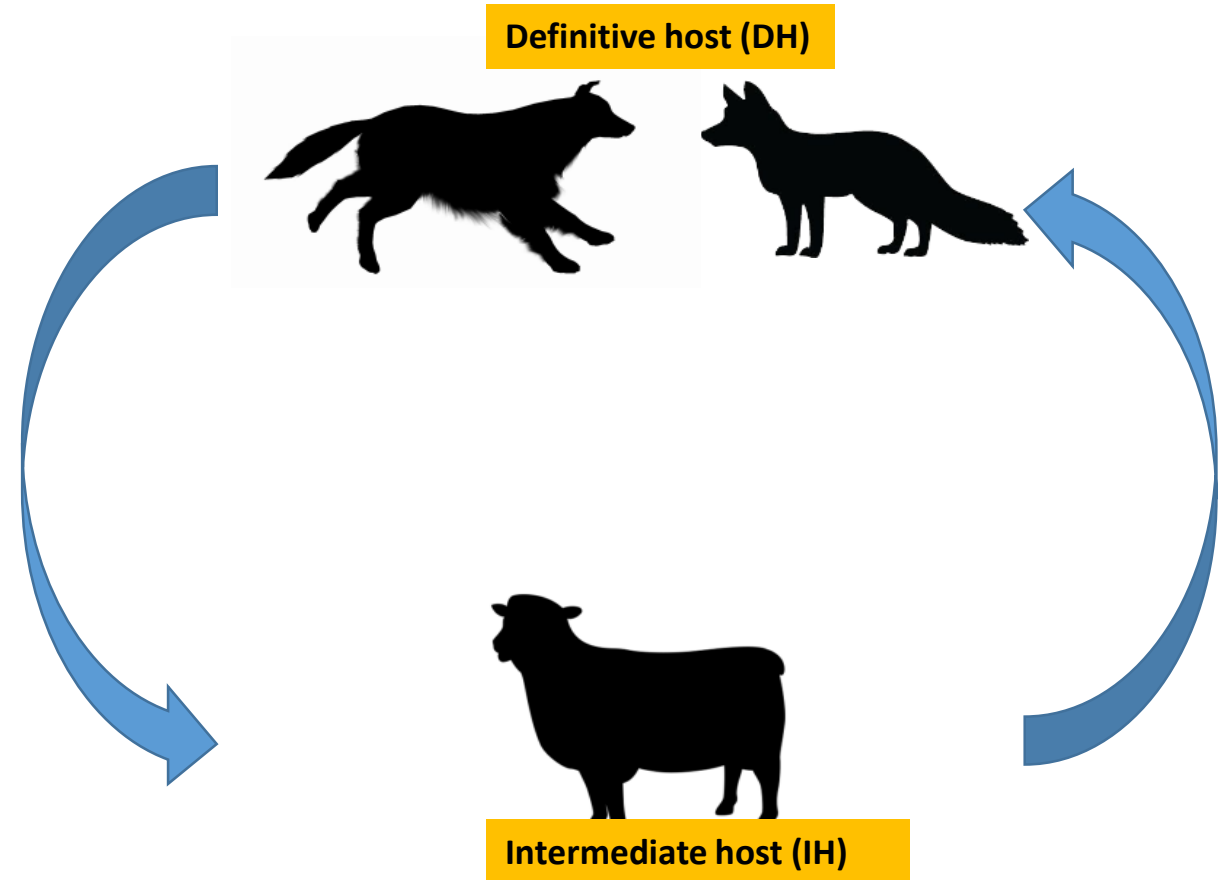
Acknowledgements

- Staff at Athlone and Sligo Regional Veterinary Laboratories
- Parasitology & Pathology sections on the Backweston laboratory campus
- Donegal Regional Veterinary Office
- Private veterinary practitioners

Additional Information

Taenia ovis

- Gives rise to the condition known as 'sheep measles'
- Adult tapeworm in small intestine of DH (asymptomatic)
- Metacestode (cysticercus ovis) develops in cardiac and skeletal muscle) of IH
 - Up to 10mm in length
 - Rarely associated with clinical disease
 - Can result in significant carcass trimming
- Prepatent period 6 – 8 weeks
- Not zoonotic
- Dogs need regular treatment!



Sarcocystis in Sheep

- **Protozoan parasite**
 - Requires >1 host to complete lifecycle
- **Oocysts/sporocysts shed in faeces by DH**
 - formed in small intestine
- **Cysts form in muscle cells of IH**
 - 0.7 – 10 mm in length in sheep
- **Clinical signs**
 - Infections in DH asymptomatic
 - Heavy challenge in IH
 - Severe endothelial cell damage
 - Fever, weakness, CNS disorders and abortion
 - Muscle cysts usually harmless.....but carcass trimming/condemnation
- **Treatment**
 - None exist (exception is *S. neurona* in horses)
- **Is it zoonotic?**
 - Humans act as DH for some species in cattle & pigs
 - Can also be aberrant IH

