

# REGIONAL VETERINARY LABORATORIES REPORT

September 2024

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 4,578 carcasses and 47 fetuses during September 2024. Additionally, 1,496 diagnostic samples were tested to assist private veterinary practitioners with the diagnosis and control of disease in food-producing animals. This report describes a selection of cases investigated by the Department of Agriculture, Food and the Marine's (DAFM) veterinary laboratories in September 2024.

The objective of this report is to provide feedback to veterinary practitioners on the pattern of disease syndromes at this time of the year by describing common and highlighting unusual cases. Moreover, we aim to assist with future diagnoses, encourage thorough investigations of clinical cases, highlight available laboratory diagnostic tools and provide a better context for practitioners when interpreting laboratory reports.

## Cattle

Pneumonia and parasitic gastroenteritis were the most common diagnoses at necropsy in cattle in the RVLs during September 2024.

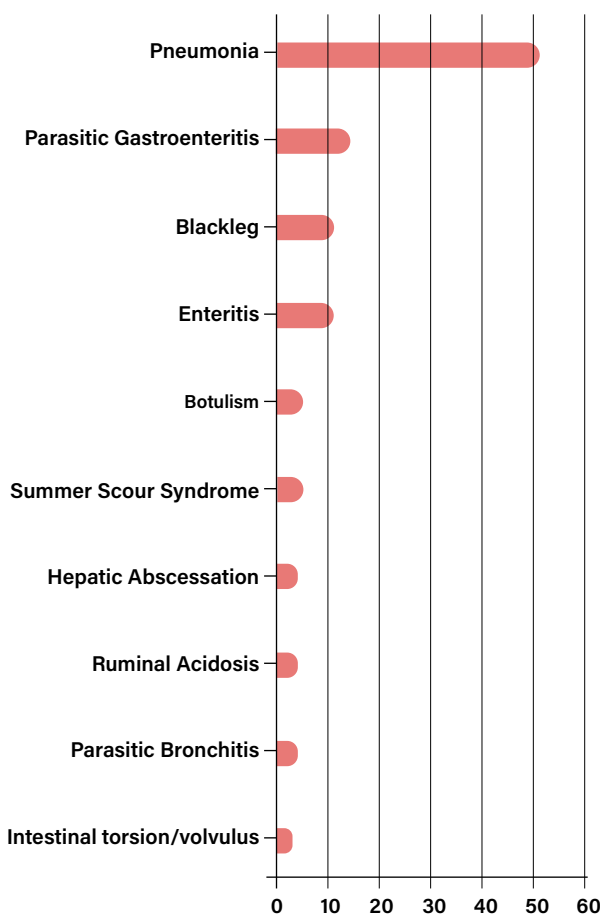


Table 1: The most common diagnoses in cattle submitted for necropsy in September 2024.

## Gastrointestinal Tract

### Summer scour syndrome

A five-month-old calf that was scouring and losing condition prior to death, was submitted to Kilkenny RVL. Twenty cases had occurred on the farm over two months. On examination, the calf was in poor body condition and there was faecal staining on the hind quarters. There was focal ulceration on the tongue and oesophagitis. No significant agent was detected on lab tests. Histopathology changes suggested a role for summer scour syndrome.



Figure 1: Oesophagitis in summer scour syndrome. Photo: Aideen Kennedy.

### Intussusception

Sligo RVL examined the carcass of a 14-month-old bullock which had been noticed unwell with melaena in the days leading up to his death. On post-mortem examination, there was a jejunal intussusception with a necrotic core approximately 30cm in length. A predisposing cause was not identified; this condition may occur spontaneously.



Figure 2: A perforated and a non-perforated abomasal ulcer. Photo: Denise Murphy.

### Perforated abomasal ulcer

Athlone RVL examined a two-month-old suckler calf with a history of sudden death. Carcass preservation was moderate and body condition was excellent, with a bodyweight of 130kg. There were ingesta and fibrin strands on the serosa of the abdominal organs. There was a 1cm-diameter perforated

abomasal ulcer and a second smaller non-perforated ulcer. A diagnosis of perforated abomasal ulcer and peritonitis was made.

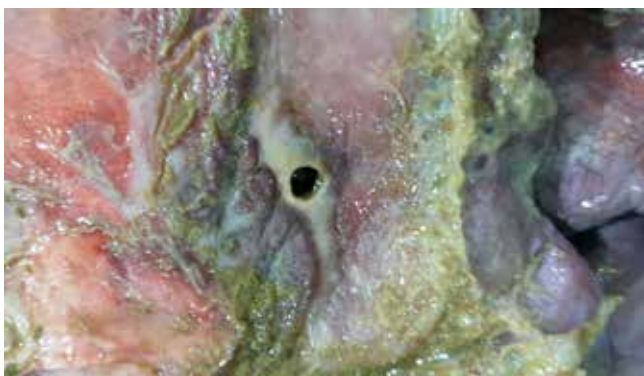


Figure 3: A perforated abomasal ulcer from the serosal side. Photo: Denise Murphy.

### Traumatic pharyngeal injury

An eight-month-old dairy calf was submitted to Dublin RVL. Antiparasitic boluses had been administered about 10 days previously. Three animals were submitted but there were eight in total affected. Necropsy revealed, on subcutaneous examination of the neck, that a fibrino-necrotic cellulitis was present. On the right side of the pharynx, dorsolateral to the hyoid apparatus, there was a circa 3cm-diameter perforation in the pharyngeal mucosa with adherent fibrino-necrotic yellow material. The oesophagus and trachea were intact. Caudal to this pharyngeal perforation, and adjacent to the oesophagus, a linear tract with contusion of the perioesophageal soft tissue was evident extending to the thoracic inlet. A bolus (11cm in length) was located in this cavity, parallel to the oesophagus and trachea. Other gross findings included: epicardial ecchymosis and a moderately enlarged liver, diffuse with rounded edges. The gall bladder contained thickened jelly-like bile (probably indicating recent inappetence). These lesions were consistent with a traumatic laceration ("dosing gun injury") to the pharynx and subsequent sepsis.



Figure 4: A bolus can be seen located in a cavity, parallel to the oesophagus and trachea. A large amount of a yellow-green necrotic material can be seen around the bolus. Above the arrow is the intact oesophagus. Photo: Sara Salgado.

### Respiratory Tract

#### Fibrinosuppurative pleuropneumonia

Athlone RVL examined a six-month-old calf submitted with a history of respiratory signs of one day's duration that had been non-responsive to treatment. On necropsy, there was cranioventral consolidation of approximately 70 per cent of the lungs, with severe fibrinous deposition over the pleura and pericardium. *Histophilus somni* was isolated from the lungs and pericardium by culture. Histopathology revealed a severe, diffuse, necrotising fibrinosuppurative

pleuropneumonia, with vasculitis, interlobular septal expansion, dilated lymphatics and myriad intra-lesional bacterial colonies. Infection of cattle with *H. somni* can result in several disease presentations: septicaemia, thrombotic meningoencephalitis (TME), polysynovitis, pleuritis, suppurative bronchopneumonia, myocarditis, otitis media, mastitis, and reproductive tract disease. Cardiac failure due to myocarditis is another possible sequel to *H. somni* infection. This organism can be carried in the bovine genital tract and nasal cavity without ill-effect. It has been documented that, in six- to 12-month-old calves, proliferation and infection can occur following a stressor, such as transportation, inclement weather, crowding, or changes in diet.



Figure 5: Fibrinous pleuritis. Photo: Aoife Coleman.

A one-month-old calf had been found dead and submitted to Kilkenny RVL. The calf was moderately dehydrated. There was pneumonia with cranioventral consolidation affecting approximately 50-60 per cent of the lung tissue. *H. somni* was detected by culture. PCR tests for other respiratory pathogens were negative.



Figure 6: Bronchopneumonia in a month-old calf. Photo: Aideen Kennedy.

#### Parasitic bronchitis and pneumonia

Limerick RVL examined a seven-month-old Friesian heifer carcass that had been found dead at pasture; the weanling had been dosed three weeks previously and was the second animal to die. Necropsy of the lungs revealed severe, diffuse, "ground glass" emphysema, suggestive of interstitial



pneumonia seen with viruses or lungworm, in the caudal lobes, with congestion and multifocal areas of ground glass emphysema in the cranial lobes. The local pulmonary lymph nodes were markedly enlarged. Lungworm (*Dictyocaulus viviparus*) and blood clots were visible in the trachea. The abomasum had a 'cobblestone' appearance suggestive of parasitism. Laboratory findings included a strongyle count of 8,350 eggs per gram (EPG) with lungworm larvae also present. *Trichuris* eggs were also observed. *Pasteurella multocida* and bovine herpesvirus 4 (BHV4) were detected by polymerase chain reaction (PCR); the involvement of BHV-4 is most likely in synergism with other pathogens. It is very difficult to evaluate the impact of the infection in livestock in a case like this as it typically occurs with other agents of disease. A diagnosis of severe pneumonia with multiple agents involved and parasitic gastroenteritis was made.



Figure 7: 'Cobblestone' pattern seen in abomasal mucosa, suggestive of parasitic gastroenteritis. Photo: Brian Toland.

Sligo RVL diagnosed several cases of patent lungworm infection in September 2024. In one such case, a six-month-old calf which had been found dead, presented on post-mortem examination with diffuse pulmonary consolidation and emphysema. There were chronic-active multifocal consolidations associated with airway obstruction and the presence of adult and maturing *D. viviparus* nematodes ('patent hoose'). *H. somni* and *P. multocida* were detected in the lungs by PCR technique. Secondary bacterial infections are common in these cases and can lead to further deaths even after treatment of the parasitic infection.

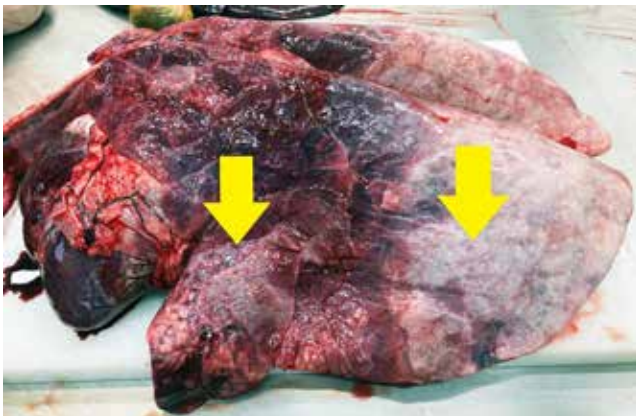


Figure 8: 'Ground glass' diffuse sub-pleural emphysema in a case of parasitic bronchitis. Photo: Brian Toland.

A six-month-old weanling with signs of pneumonia was submitted to Kilkenny RVL having failed to respond to antibiotic treatment. Two others had died in the group. On necropsy, the lungs were very heavy, there was multifocal 'ground glass' diffuse sub-pleural emphysema and there were large numbers of *D. viviparus* lungworm visible in the airways. There was cranioventral consolidation and atelectasis affecting the right cranial lobe. *Mannheimia haemolytica* and *P. multocida* PCR positive test results were obtained. A strongyle egg count of over 8,000EPG was obtained. A review of parasite control including lungworm was recommended.



Figure 9: Caudal overinflation and emphysema in a case of parasitic bronchitis. Photo: Aideen Kennedy.

## Urinary/Reproductive Tract

### Cystitis

The carcass of a three-month-old calf which had been noticed dull and unresponsive to treatment was submitted to Sligo RVL. On necropsy, there were large amounts of straw-coloured fluid present in its abdomen. There was necrotising peritonitis focally on the omentum, adjoining jejunum, and colon. There was rumenitis. There was a ruptured cyst on the cranial bladder pole. There was cystitis. Ticks (*Ixodes ricinus*) were noted on the carcass. Ruminal pH was 5.3. On histopathology, there was diffuse, chronic severe, necro-suppurative cystitis. *Anaplasma phagocytophylum* was detected by PCR. Necrotising cystitis and ruminal acidosis were diagnosed as the cause of death. There was concurrent, likely pre-disposing, tick-borne fever.

## Cardiovascular System

### Vegetative endocarditis

A two-month-old Limousin-cross heifer suckler calf was submitted to Limerick RVL with a history of severe dyspnoea. Post-mortem examination revealed a swollen umbilicus and numerous cauliflower-like lesions on the tricuspid valve. *Streptococcus dysgalactiae* was cultured from the cardiac lesions and these may have been a sequel to omphalophlebitis. A diagnosis of vegetative valvular endocarditis was made.



Figure 10: Vegetative lesions on the tricuspid valve in a case of endocarditis in a calf. Photo: Brian Toland.

## Nervous System

### Thrombo-embolic encephalitis

Sligo RVL diagnosed infectious thrombo-embolic encephalitis in a heifer. The animal had been noticed initially lame, then within hours deteriorated to recumbency and had to be euthanised. On post-mortem, there was a hepatic abscess, 6cm in size. There was diffuse, severe, abomasal ulceration with 'coffee ground' contents, suggestive of abomasal haemorrhage. The intestinal contents were black (melaena) and there was excessive cerebrospinal fluid with fibrin clots. There were sub-meningeal haemorrhages on the brain. On histopathology, there was multifocal, severe, fibrino-haemorrhagic meningoencephalitis with extensive haemorrhage, vasculitis, thrombosis and presence of bacteria. Infectious thromboembolic meningoencephalitis caused by *H. somni* was diagnosed as the cause of death. The hepatic abscessation was most likely an incidental finding and not related to the cause of death in this case.

## Musculoskeletal



Figure 11: Lingual clostridial myositis. Photo: Aoife Coleman.

### Blackleg

Athlone RVL examined a six-month-old weanling with history of recumbency. Three cohort animals had died on farm in the preceding two days. Necropsy disclosed severe facial and submandibular oedema. The musculature of the tongue when sectioned displayed areas of blackening with emphysematous and oedematous changes. Further similar lesions were disclosed bilaterally in the forelimbs with a florid pericarditis noted. A diagnosis of clostridial myositis (blackleg) was confirmed with a positive fluorescent antibody technique (FAT) of *Clostridium chauvoei* from both the tongue and forelimb musculature.

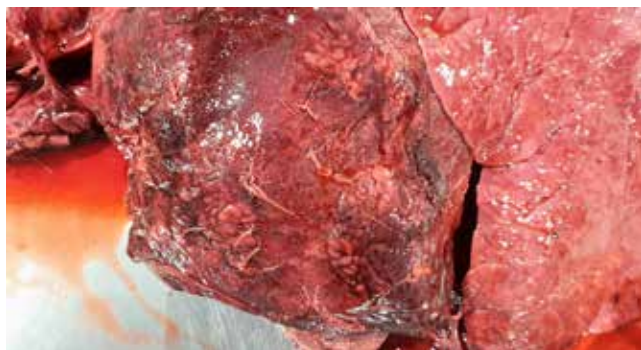


Figure 12: Florid acute fibrinous pericarditis in a case of blackleg. Photo: Aoife Coleman.

## Poisonings

### Copper poisoning

The carcass of a seven-month-old calf which had become anorexic was submitted to Sligo RVL. On post-mortem examination, there was generalised jaundice and scant intestinal contents. There was diffuse abomasal fold ulceration. The urine was brown in colour. The renal cortex and hepatic parenchyma copper concentrations were in the toxic range. On histopathology, there was submassive hepatic necrosis and haemorrhage as well as biliary obstruction. Black granules indicative of copper were detected using a rubeanic acid stain in necrotic areas. The kidney showed degeneration of tubular epithelium, and haemoglobin, tubular casts, sloughed off cells in ectatic tubules, and attenuation of tubular epithelium. Copper poisoning was diagnosed as the most likely cause of death. The source of copper was not identified from the history in this case.

## Miscellaneous

### Cleft palate

Athlone RVL examined a one-day-old calf that was submitted having displayed dyspnoea and lethargy after birth. Necropsy disclosed a large cleft palate involving both the hard and soft palate. These congenital defects occur when the palatine shelves fail to fuse along the midline during gestation. Congenital oronasal fistulas can involve either the primary palate (involving the lip and incisive bone), cleft lip (harelip); or the secondary palate (involving the hard and soft palate). Molecular testing on this calf did not identify any infectious agent. Dysphagia is often reported as a clinical sign in these cases as is milk extrusion via the nostrils.



Figure 13: Cleft palate in a neonatal calf. Photo: Aoife Coleman.



## Sheep

Parasitic gastroenteritis and bacteraemia/septicaemia were the most common diagnoses at necropsy in sheep in the RVLs during September 2024.

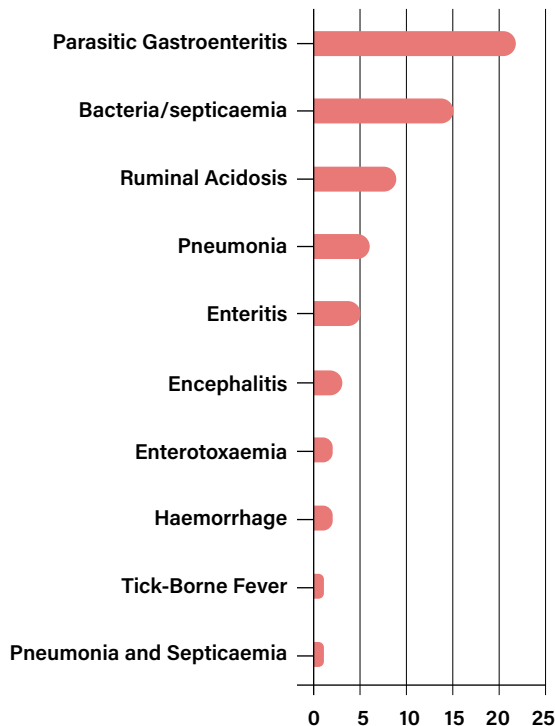


Table 2: The most common diagnoses in sheep submitted for necropsy in September 2024.

## Gastrointestinal Tract

### Haemonchosis

A seven-month-old ram that was pining was euthanised and submitted to Kilkenny RVL. The carcass was very anaemic, and the abomasum contained large numbers of *Haemonchus contortus* nematodes, and the intestinal contents were fluid. A strongyle count of 4,900EPG was recorded on McMaster. A review of parasite control was recommended with examination of cohorts for signs of anaemia advised. Anaemia, submandibular oedema, and poor thrive are key clinical signs, and diarrhoea typically isn't a feature unless there are mixed infections. Because *Haemonchus* was formerly a rare parasite in Ireland, many cases are initially confused with fasciolosis because of the anaemia.



Figure 14: Pale mucous membranes due to anaemia in a case of haemonchosis. Photo: Aideen Kennedy.

As previously observed and reported in August 2024, Sligo RVL saw more cases of *H. contortus* ('barber's pole worm') infection in sheep. In one case, a yearling ram had been not eating and showed pale conjunctiva. There was tachycardia and the lips seemed swollen. On necropsy, there was a significant number of the distinctive nematodes present in the abomasum. The animal's mucous membranes were porcelain white. The nematodes were identified as *H. contortus*. This case highlights that *H. contortus* is now an important parasite affecting sheep flocks in the north-west of Ireland.

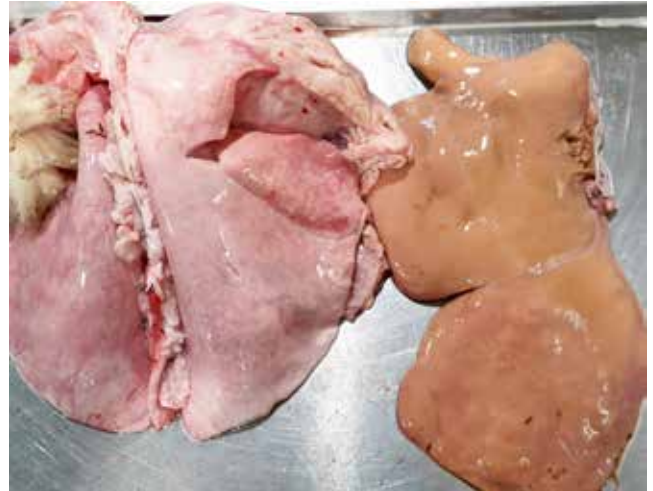


Figure 15: Pale lung and liver due to anaemia in a case of haemonchosis. Photo: Denise Murphy.

Athlone RVL is also continuing to see cases of *H. contortus* occur in sheep. Two five-month-old lambs were submitted with histories of sudden death. There were similar gross findings in both lambs at post-mortem examination. The carcasses were very pale with white mucous membranes, and very pale lungs and liver, kidneys, and gastrointestinal serosa. There was marked subcutaneous oedema of the ventral jaw and neck, and marked ascites. The abomasum contained very loose brown fluid, and worms were visible to the naked eye. The small intestinal and large intestinal contents were very loose, and worms were seen in the contents with the naked eye. Faecal strongyle egg counts of 5,800 and 1,800EPG were detected in the faeces. *H. contortus* worms are prolific egg layers. A diagnosis of *H. contortus* infection was reported. Haemonchosis can occur in both adults and in young sheep. Anaemia due to blood loss is the usual cause of death in these cases, and it has been determined that each worm removes about 0.05ml of blood daily from its host, so a burden of 2,000 worms would result in a daily blood loss of 100ml which rapidly overtakes the haemopoietic capability of the host.

### Ruminal acidosis

A four-year-old ewe was presented to Kilkenny RVL with a history of being off form. On post-mortem examination, the rumen was distended with grain and fluid. The rumen mucosa appeared inflamed and did not slough easily. The rumen pH was 3.8, whereas normal ruminal values range from 5.5 to 7. A diagnosis of rumen acidosis was reported. Rapid fermentation of starch causes high levels of lactic acid to form quickly in the rumen, killing essential microbes, damaging the mucosal lining and drawing in body fluid by osmosis. This leads to ruminal stasis, dehydration, and

diarrhoea. Histopathological lesions associated with acidosis include intraepithelial neutrophilic inflammatory infiltrate and parakeratotic hyperkeratosis.



**Figure 16: Rumen distended with grain in a case of ovine acidosis. Photo: Lisa Buckley.**

Several cases of ruminal acidosis in sheep were diagnosed in Sligo RVL. Most of the cases affected lambs. In one case, a six-month-old lamb which had been noticed to be sick and unresponsive to treatment presented on post-mortem examination with ruminal contents that were foamy with a sour smell. There was also acute fasciolosis. The ruminal contents pH was measured as 5.31. Due to buffering processes, the ruminal pH rises after death and a rumen pH below 5.5 is indicative of rumen acidosis.

## Respiratory Tract

### Pneumonia

A five-year-old ewe was presented to Kilkenny RVL with a history of sudden death. On post-mortem examination, there was consolidation of the cranial and middle lobes of the left lung with a fibrinous exudate. *M. haemolytica* was isolated by culture. On histopathology, bronchioles were multifocally filled with neutrophils and necrotic cell debris, some cells were degenerate with elongated nuclei (streaming leukocytes/oat cells). The inter-lobular septa were expanded with oedema and neutrophils. The pleura was thickened by oedema, fibrin, and cell debris. A diagnosis of diffuse, severe, fibrinosuppurative and necrotising bronchopneumonia was made. Acute *M. haemolytica* infections tend to occur in animals that have undergone a recent stress, such as transportation, weaning, change of diet, or commingling with animals from unrelated farms.



**Figure 17: Ovine pneumonia from which Mannheimia haemolytica was isolated. Photo: Lisa Buckley.**

## Systemic pasteurellosis

Athlone RVL saw several cases of systemic pasteurellosis in lambs in September. In one case, two five-month-old lambs were submitted for necropsy. There had been nine similar losses in the flock in the previous ten days. There were similar gross findings in both lambs: multifocal ulcers on the caudal tongue, pharynx, larynx, and oesophagus with a severe ulcerative oesophagitis in one lamb. There was marked pulmonary congestion and haemorrhage, and splenic enlargement. Intestinal contents were very loose. Faecal egg counts of 3,500 and 1,800EPG of strongyle eggs were detected in faeces. PCR for *A. phagocytophylum* was positive. This is the causative agent of tick-borne fever (TBF) which causes profound immunosuppression. *Bibersteinia trehalosi* was isolated from liver and lung; this is the causative agent of systemic pasteurellosis. PCR tests also confirmed *B. trehalosi*. Histopathology of the liver showed multifocal aggregates of bacterial colonies and well-scattered foci of necrosis. Similar lesions were seen in the lungs. These histopathological findings are consistent with systemic pasteurellosis. The concurrent parasitic gastroenteritis and TBF infection are likely to have predisposed the lambs to the infection.



**Figure 18: Oesophageal ulcers in a case of systemic pasteurellosis. Photo: Denise Murphy.**

A six-month-old lamb was found dead and submitted to Kilkenny RVL. There had been four deaths in the previous ten days. On necropsy, there was an oesophagitis. The lungs were congested. *B. trehalosi* was cultured from multiple organs suggesting a bacteremia/ septicemia. *B. trehalosi* can be associated with ulcerative lesions covered by yellow plaques of fibrin and necrotic debris on the oesophagus as seen in this case. There were small numbers of *Haemonchus* visible in the abomasum and a review of parasite control was recommended. *B. trehalosi* control is best achieved by vaccination; however, parasitic gastroenteritis, stress, and poor nutrition can cause animals to become susceptible despite appropriate vaccination.



**Figure 19: Oesophagitis in a case of systemic pasteurellosis. Photo: Aideen Kennedy.**



## Nervous System

### Cerebral abscessation

Athlone RVL carried out a post-mortem on a six-month-old lamb which had been purchased three weeks previously. The history was of sudden death. On post-mortem examination of the brain, there was flattening of the gyri and cerebellar coning. A large abscess was present in the posterior cortex.



Figure 20: An abscess in the posterior cortex of a lamb. Photo: Seamus Fagan.

### Louping ill/tick-borne fever

The carcasses of three one-year-old hoggets were submitted to Sligo RVL. These animals had been found dead, but further animals in the group were noticed sick, grinding teeth showing bruxism, and circling. Ticks (*I. ricinus*) were present on all carcasses. Due to the state of preservation, one ewe was not suitable for testing and the tests available for the others were limited. In one ewe, louping ill virus was detected by PCR in the brain, in the other *A. phagocytophylum*, the causative agent of TBF, was detected. Tick-borne diseases were diagnosed as the cause of death in this flock and a review of tick control was strongly advised.

## Avian

### Egg peritonitis

A backyard hen was found dead and submitted to Kilkenny. On examination, there was a severe fibrinous peritonitis, with egg structures visible. Egg peritonitis was diagnosed.



Figure 21: Egg peritonitis in a backyard hen. Photo: Aideen Kennedy.

### Infectious laryngotracheitis, *Mycoplasma gallisepticum* and infectious bronchitis

Athlone RVL examined a 15-week-old backyard hen in which body condition was poor; there was very little carcass fat and poor muscle cover. There was mucus in the nares. There was feed in the crop and gizzard, and soft intestinal contents. The liver and lungs were unremarkable. Samples for avian influenza tested negative. Tests for infectious laryngotracheitis (ILT), *Mycoplasma gallisepticum* and infectious bronchitis (IB) proved positive. Infectious laryngotracheitis is an acute, highly contagious, herpesvirus infection of chickens and pheasants characterised by severe dyspnoea, coughing, and rales. It can also be a subacute disease with nasal and ocular discharge, tracheitis, conjunctivitis, and mild rales. *M. gallisepticum* causes chronic respiratory disease of domestic poultry, especially in the presence of management stresses and/or other respiratory pathogens. Both *M. gallisepticum* and ILT are notifiable diseases. Avian infectious bronchitis is a highly contagious worldwide disease of poultry. It affects the respiratory and renal systems. The most important route of transmission is by aerosols and infection spreads rapidly among susceptible birds. Infectious bronchitis is not a notifiable disease. Backyard flocks are a potential source of infection for larger commercial poultry farms in their vicinity. The regional veterinary laboratories offer a free post-mortem service for backyard flocks. Contact your local RVL for further information.

## Deer

### Tuberculosis

A pluck from a deer, species unidentified, was submitted to Kilkenny RVL for tuberculosis testing. The bronchial and mediastinal lymph nodes were enlarged and the cut surface revealed abscessation. *Mycobacterium bovis*, the causative organism of TB, was isolated on culture. On histopathology, there was a granulomatous inflammation with multifocal areas of necrosis and some mineralisation. Large multinucleated giant cells were evident. ZN staining was positive confirming the presence of *M. bovis* bacilli.



Figure 22: A tuberculous lesion in a cervine lymph node. Photo: Lisa Buckley.