

REGIONAL VETERINARY LABORATORIES REPORT

September 2023

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 406 carcasses and 36 fetuses during September 2023. Additionally, 1,955 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) regional veterinary laboratories in September 2023. 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 bronchitis were the most common diagnoses at necropsy in cattle in the RVLs during September 2023.

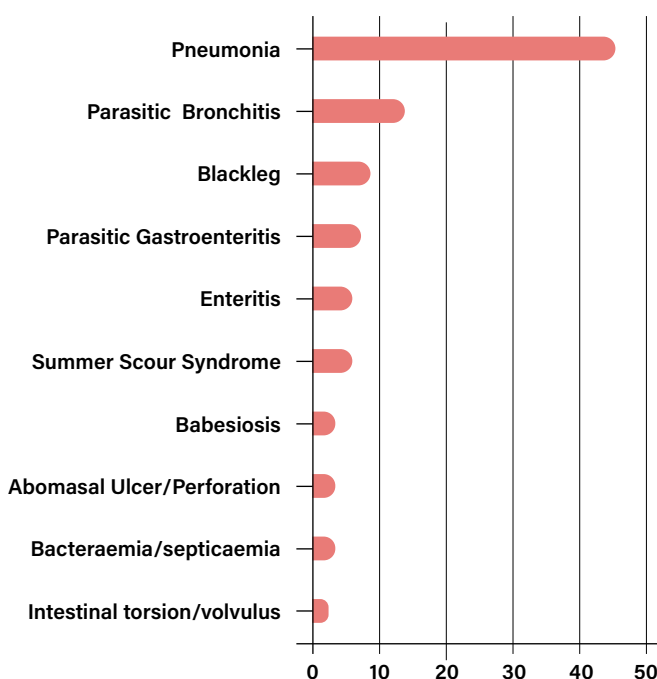


Table 1: The most common diagnoses in cattle submitted for necropsy in September 2023.

Gastrointestinal Tract

Parasitic gastroenteritis

A six-month-old Hereford cross heifer was presented to Limerick RVL with a history of watery diarrhoea. There was a marked cobblestone appearance of the abomasum which is suggestive of parasitism. The animal was diagnosed with parasitic gastroenteritis (PGE) with a strongyle egg count of 11,000 eggs per gram (EPG). Counts greater than 700EPG are considered heavy burdens.



Figure 1: Oedema and 'Morocco-leather' appearance of the abomasal mucosa in a case of parasitic gastroenteritis. Photo: Maresa Sheehan.

A high number of both sheep and cattle were submitted to Kilkenny RVL during September where a parasitic gastroenteritis was diagnosed by necropsy. Typically, the abomasal mucosa was thickened and/or oedematous with evidence of hyperplastic glands. There were very high strongyle egg counts detected, frequently in the thousands. The wet and mild weather conditions most likely contributed to heavy pasture burdens.

Perforated abomasal ulcer

A seven-week-old calf that had been found sick and bloated before dying was submitted to Kilkenny RVL. There was a fibrinous peritonitis with the source of infection identified as leakage from a perforated abomasum ulcer. There was marked oedema of the abomasal folds, and the mucosa appeared very inflamed multifocally. Positive fluorescent antibody technique (FAT) results for *Clostridium sordellii* were obtained, and a review of the clostridial vaccination protocol was recommended. In addition, on histopathology, *Sarcina* spp were visible. Until more is known of the specific risk factors for the involvement of *Sarcina* species in abomasal pathology, the practical advice is limited to maintaining good hygiene when preparing and handling milk feeds for young ruminants and preventing the contamination of all feeds with soil. *Sarcina* spp can proliferate when there is an excess of fermentable carbohydrate within the abomasum. This could occur if a degree of tympany develops following ingestion of a large volume of milk.



Figure 2: Inflamed and oedematous abomasal mucosa from which *Clostridium sordellii* was detected. Photo: Aideen Kennedy.

Ileus

Sligo RVL received the carcass of a five-year-old cow with a history of sudden recumbency and bloat. Green-coloured faeces were observed by the farmer. On gross post-mortem examination, there was severe dehydration, and the gastro-intestinal tract was overfilled with fluid, grass and silage. Jejunal loops, with sub-serosal haemorrhages, were adherent to the cranioventral abdominal wall, at points where there was severe local peritonitis, and to the dorsal uterus causing ileus. On histopathology, there was diffuse, chronic-fibrosing non-suppurative peritonitis. An infectious agent could not be identified which is not surprising given the chronicity of observed changes.

Respiratory Tract Pneumonia

A three-month-old calf with respiratory signs died and was submitted to Kilkenny RVL, others in the herd were also affected. On necropsy, there was a severe pneumonia. There was cranioventral consolidation affecting approximately 60 per cent of the lung volume. There was 'rice grain' multifocal areas of abscessation within the consolidated region. *Histophilus somni* was cultured from the lung, and polymerase chain reaction (PCR) results were positive for *H. somni* and *Pasteurella multocida*. Tests for *Mycoplasma bovis* were negative.

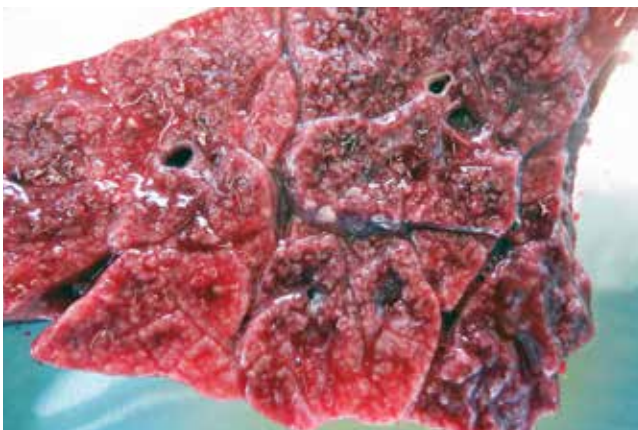


Figure 3: Pneumonia with 'rice grain' abscessation. Photo: Aideen Kennedy.

Two yearling bullocks were submitted to Kilkenny RVL with a history of rapid death. There was a history of respiratory disease on the farm, but these animals were not observed by the farmer showing respiratory signs. Both animals had severe bilateral pneumonia, and both had a fibrinous pericarditis. *H. somni* was detected from both these animals. This bacterium can cause an acute fibrinous pleuropneumonia and can also cause a myocarditis. A review of its control was recommended.

Parasitic bronchitis

A 10-year-old cow was presented to Kilkenny RVL with a history of ill thrift. The lungs were overinflated caudally and there were multifocal areas of 'ground glass' emphysema throughout. This is the typical gross appearance of patent lungworm infection as the worms develop in bronchi and cause atelectasis, emphysema, and verminous pneumonia, with foamy emphysema under the visceral pleura giving the 'ground glass' appearance. The bronchioles in this case contained moderate numbers of adult lungworm (*Dictyocaulus viviparus*). Emphysema develops due to forced expiration and damage to bronchioles may be seen in severe cases. Although lungworm typically affects cattle in their first grazing season, adult cattle with immunosuppression or exposure to heavily contaminated pasture, may suffer from reinfection syndrome.



Figure 4: 'Ground glass' emphysema in a case of *Dictyocaulus viviparus* infection. Photo: Lisa Buckley.

A seven-month-old calf, which had been a poor thriver since birth, was submitted to Sligo RVL. On gross post-mortem examination, there was severe dehydration. The lungs presented with extensive 'ground glass' emphysema and oedema. The airways were partially obstructed with large numbers of adult lungworm. While the historic cause of poor thrive could not be established, the cause of death in this case was acute parasitic bronchitis.

Urinary/Reproductive Tract Nephritis

A ten-week-old calf with a history of weakness in the back legs and deterioration despite treatment was submitted to Sligo RVL. On post-mortem examination, there were no visible external injuries. There was mild segmental enteritis with haemorrhagic contents. There was pleural effusion

and pulmonary oedema. Petechiae were present on the thymus. Histopathology revealed non-suppurative interstitial nephritis with a large number of lymphocytes, plasma cells and occasional neutrophils. A specific infectious agent could not be identified. Nephritis and septicaemia were diagnosed as cause of death.

Cardiovascular System

Pulmonary thromboembolism

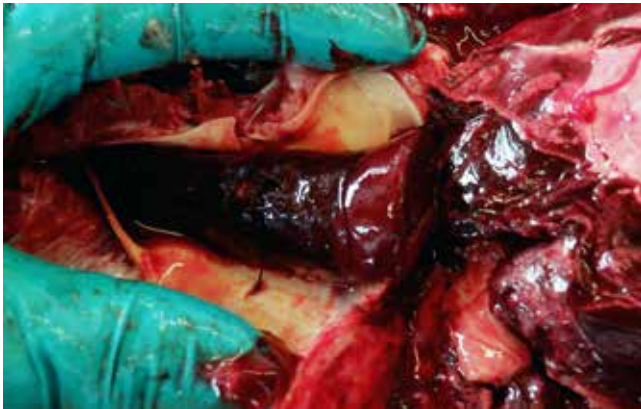


Figure 5: Pulmonary thromboembolism. Photo: Aideen Kennedy.

A five-year-old cow was submitted to Kilkenny RVL, with a history of epistaxis before death. On necropsy, there was a large, pulmonary thromboembolism approximately 15-20cm in length. There were additional small, randomly distributed foci of pneumonia. The liver was rounded and firm, no vena cava thrombosis was noted. The cow had chronic mastitis, and the embolism may have arisen secondary to this condition.

Vegetative endocarditis



Figure 6: Vegetative endocarditis. Photo: Aideen Kennedy.

A two-year-old bull died and was submitted to Kilkenny RVL. Intermittent lameness had been noticed prior to death. On gross examination of the heart, there was a vegetative endocarditis, and there was a 'nutmeg pattern' to the liver indicative of passive venous congestion. There was multifocal embolic pneumonia and multifocal infarcts in the kidney.



Figure 7: A 'nutmeg' appearance of the liver indicative of passive venous congestion. Photo: Aideen Kennedy.

Babesiosis ('red water')



Figure 8: Port-wine coloured urine in a case of haemoglobinuria. Photo: Alan Johnson.

A Friesian cow with a history of milk drop and inappetence was submitted to Limerick RVL. The owner reported that the cows had access to bracken ferns (*Pteridium* spp) and that there was evidence that some of these had been eaten. The animal had been passing some blood in the faeces. Gross findings at necropsy included signs of anaemia such as pale lungs, haemoglobinuria, and yellow pigmentation of the liver. Also observed were splenomegaly and some petechial haemorrhages on the heart. *Myroides odoratimimus* was isolated from the liver. *M. odoratimimus* is an obligate aerobic, gram-negative bacterium. Although it has been isolated from a range of bodily fluids, it is a rare opportunistic pathogen. *Myroides* spp. are commonly found in the environment. Differential diagnoses included babesiosis, copper poisoning and bracken fern poisoning. Hypophosphataemia should be considered in similar cases in newly calved cows. Liver copper was within the normal range. PCR results were positive for *Babesia divergens*. A diagnosis of babesiosis ('red water') associated with *B. divergens* infection was made.

Nervous System

Thrombotic meningoencephalitis



Figure 9: Haemorrhagic gross lesions in the brainstem of a nine-month-old caused by thrombotic meningoencephalitis. Photo: Brian Toland.

A nine-month-old Limousin cross bullock approximately 400kg in weight was presented to Limerick RVL. It had been bought in a few weeks previously and found recumbent at pasture with a very high temperature and did not respond to treatment. Post-mortem examination revealed congested lungs with a small, fist-sized area of consolidation in the cranial lobe containing visible and palpable nodular white lesions. Transverse section through the cerebrum and midbrain revealed symmetrical, round haemorrhagic lesions. Histopathology of the brain identified acute suppurative haemorrhagic meningoencephalitis with severe marked thrombosis, necrotising vasculitis, adjacent necrosis of brain parenchyma, and perivascular haemorrhage. There was a multifocal necrotising pneumonia with intralesional bacteria in the lungs. *Mycoplasma bovis* was positive on immunohistochemistry and PCR from the lung tissue. *H. somni* was also identified on lung PCR and is a major differential diagnosis for the histopathology changes seen in the brain resulting in thrombotic meningoencephalitis (TME).

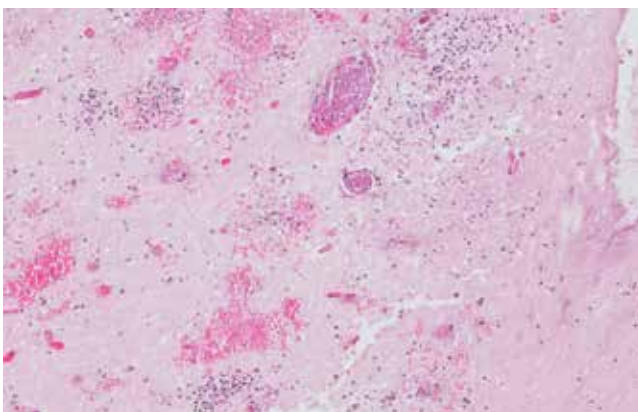


Figure 10: Thrombosing encephalitis, vasculitis, necrosis, and perivascular haemorrhage in a case of bovine thrombotic meningoencephalitis. Photo: Brian Toland.

Sheep

Parasitic gastroenteritis and bacteraemia/septicaemia were the most common diagnoses at necropsy in sheep in the RVLs during September 2023.

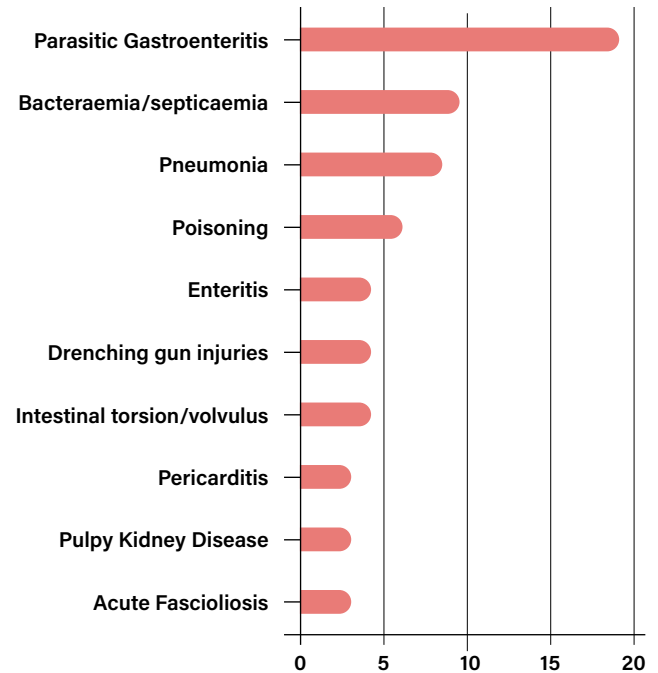


Table 2: The most common diagnoses in sheep submitted for necropsy in September 2023.

Gastrointestinal Tract

Acute fascioliosis

Sligo RVL diagnosed acute fascioliosis in several cases during September 2023.

In a typical case, a five-month-old lamb was submitted with a history of sudden death and mild diarrhoea. The farmer had experienced a large number of losses in the last fortnight before this submission. Post-mortem examination revealed haemorrhagic tracts on the liver, and ascites. There was localised peritonitis on the visceral hepatic surface. Intestinal contents were watery, and the lungs had a mottled appearance. Histopathology revealed multifocal, severe, acute suppurative pneumonia with streaming 'oat cells', neutrophils, neutrophilic debris and large bacterial colonies. *Bibersteinia trehalosi* was detected by PCR from lung tissue. Acute fascioliosis with secondary pasteurellosis was diagnosed as cause of death.

Parasitic gastroenteritis (*Haemonchus contortus*)

A five-month-old lamb was found dead and submitted to Kilkenny RVL. On examination, the lamb was dehydrated and had very pale mucous membranes. There was moderate abomasum fold oedema and multiple *Haemonchus contortus* parasites visible on the abomasal mucosa. A strongyle count of almost 9,000EPG was recorded and a review of parasite control, including examination of cohorts for signs of anaemia, was recommended.

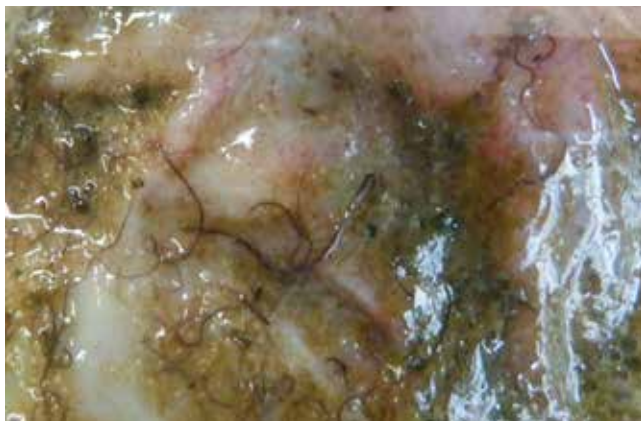


Figure 11: *Haemonchus contortus* on the abomasal surface. The 'barber's pole' red-and-white stripes of the worm's pale uterus spiralling around its blood-filled intestine are just visible. Photo: Aideen Kennedy.

Haemonchus contortus produces eggs that are very similar in size and shape to those produced by other roundworms such as *Ostertagia* and *Cooperia*. Indicators of *H. contortus* in a sheep include the presence of elevated faecal egg counts (e.g., > 1,000 eggs per gram) and clinical signs including poor thrive, anaemia, general weakness, bottle jaw, with little or no diarrhoea. However, a definitive diagnosis of *H. contortus* can only be reached currently via post-mortem examination when these roundworms, measuring up to 30mm, are observed in the abomasum (fourth stomach). In contrast to *H. contortus*, the maximum size of *Ostertagia ostertagi* roundworms, which are also located in the abomasum, is 10mm. The perception from the Department labs is that *H. contortus* is increasing in Ireland and the geographic area it has been diagnosed in is expanding. The Department is currently working on a test to differentiate *H. contortus* eggs from those of other common roundworm eggs.

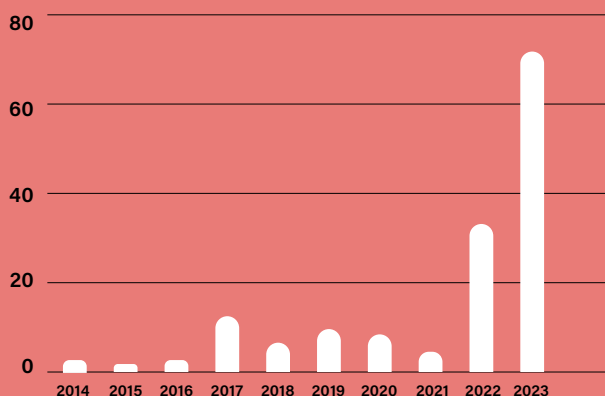


Table 3: The number of necropsies where *Haemonchus contortus* was diagnosed each year.

This table shows the number of post-mortems across all ruminant species where *H. contortus* was identified as the cause of death. While these data show an uptick in the diagnoses of death due to *Haemonchus*, this is a simple count of post-mortems – some of these may represent multiple submissions from a single farm/

incident. Having said that, our experience is largely in accordance with the industry perception that this parasite is becoming more widespread and impactful in Ireland. Nonetheless, the figures should be interpreted with some caution: all RVL post-mortems are carried out voluntarily, and the caseload is largely selected by the referring veterinary practitioners. While the observed increase in the involvement of *Haemonchus* in mortalities investigated by RVL post-mortems may indeed reflect an increased prevalence, some part of the increased numbers may be a result of heightened awareness of the disease as a cause of illness especially weight loss and anaemia in sheep (in particular), especially through the monthly reports of RVL findings in the *Veterinary Ireland Journal*.

Respiratory Tract

Systemic pasteurellosis

Dublin RVL examined a seven-month-old lamb found recumbent in the field, grinding the teeth, while the group was being moved. There had been three similar losses over the previous week. There were 480 ewes and 260 lambs in the farm. On gross post-mortem examination, the lungs were diffusely severely congested and oedematous; there was an ulcerative lesion on the larynx covered by a yellow necrotic pseudo-membrane; there were multifocal-to-coalescing ulcerations in the oesophageal mucosa; there were multifocal, white, pinpoint to 1cm lesions throughout the liver, which was also diffusely congested. *B. trehalosi* was isolated from the liver. PCR strong positive results were obtained for *B. trehalosi*, *Mannheimia haemolytica*, *P. multocida* and *Mycoplasma ovipneumoniae*. Histopathological examination of the liver, where the *B. trehalosi* had been isolated from, disclosed multifocal areas of necrosis containing large numbers of gram-negative bacteria. In the lungs, there was multifocal necrotising interstitial pneumonia with bacteria colonies, haemorrhage and fibrinous exudate into alveoli. All the findings were consistent with systemic pasteurellosis. Pasteurellosis is a common reason for sudden death in sheep, caused by either *M. haemolytica* or *B. trehalosi*, both of which are common commensals located in the pharynx and tonsils. Systemic *B. trehalosi* infections typically affect six-to-nine-months-old lambs with outbreaks usually occurring between October and December. Control is best achieved by vaccination; however, parasitic gastroenteritis, stress (recent handling, transport or mixing, changes in the weather), poor nutrition, cobalt/selenium deficiency or underlying infections, such as *M. ovipneumoniae*, can cause animals to become susceptible despite appropriate vaccination.

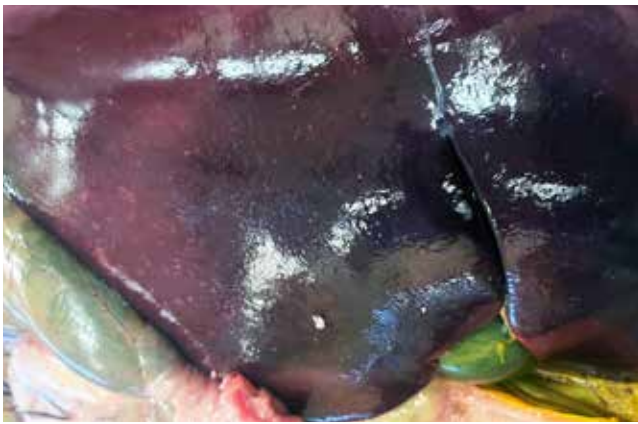


Figure 12: Pinpoint multifocal white hepatic lesions in a sheep with systemic pasteurellosis. Photo: Sara Salgado.

Ovine pulmonary adenocarcinoma

A four-year-old ewe, with a history of dyspnoea and fluid secretion from her mouth and nostrils after being handled, was submitted to Sligo RVL. On post-mortem examination, the lungs appeared pale with multifocal nodular white-grey areas. There was chronic active fascioliosis. Jaagsiekte virus was confirmed by PCR. Ovine pulmonary adenocarcinoma (OPA or Jaagsiekte) and concurrent fascioliosis were diagnosed as cause of death. There was also a concurrent parasitic gastroenteritis.

Urinary/Reproductive Tract

Pyelonephritis

A four-year-old ram was presented to Kilkenny RVL with a history of weight loss. On post-mortem examination, the serosal and mucosal surfaces of the bladder were inflamed, and the wall was obviously thickened. The kidneys were enlarged, there was dilation of the renal pelvises and loss of the renal parenchyma. There was multifocal microabscessation in the renal cortices. *Escherichia coli* was cultured from the bladder, liver and lung, indicating a bacteraemia/septicaemia. A diagnosis of chronic urinary cystitis and pyelonephritis was made. *E. coli* and *Corynebacterium renale* are the most common causative agents.



Figure 13: Pyelonephritis. The loss of renal parenchyma is evident. Photo: Lisa Buckley.

Nervous System

Louping Ill

Sligo RVL diagnosed louping ill in a five-month-old lamb. The animal was submitted with a history of leg weakness, shaking, and shivering. On post-mortem examination, a severe tick infestation was noted. There were no other visible lesions on gross post-mortem examination. Louping ill virus was detected in a sample of central nervous system tissue by PCR. Moreover, *Anaplasma phagocytophilum* ('tickborne fever') was detected systemically by PCR.

Musculo-skeletal

Clostridial myositis

A five-month-old lamb with a history of sudden death was submitted to Sligo RVL. On post-mortem examination, there was locally extensive gangrenous oedematous hindlimb myositis with associated cellulitis. There was diffuse parasitic gastroenteritis and *Moniezia* tapeworms were evident. *Clostridium novyi* was detected in the lesions by FAT. DNA specific to *A. phagocytophilum* was detected systemically by PCR testing indicating concurrent tick-borne fever.

Poisonings

Plant poisoning

Sligo RVL received three one-year-old ewes with a history of sudden death after hedge cutting. There were similar findings in all three ewes. There were large volumes of aspirated material in their airways and lung consolidation evident at necropsy. Their muzzles were wet. There were large amounts of *Pieris*/Laurel leaves as well as multiple other species of leaves in the rumen. *Pieris* is highly poisonous to sheep and normally presents clinically with vomiting/regurgitation, and wet mouths and muzzles.

Horses

Salmonellosis

A four-week-old Irish Cob colt foal did not respond to treatment for diarrhoea and pneumonia and was submitted to Limerick RVL. On post-mortem examination, the walls of the caecum and colon were thickened and inflamed containing dark brown/black watery contents with yellow fibrin tags present on the mucosa. The right lung was congested and contained a thumbnail-sized abscess in the body of the lung. The spleen had a distorted shape with multifocal nodules and haemorrhages on its surface. *Salmonella enterica* subspecies Typhimurium was isolated; it is a notifiable and zoonotic disease. There is a heightened risk for vulnerable groups such as very old, very young or immunosuppressed people.



Figure 14: Thickened and inflamed large intestinal mucosa in a case of Salmonellosis. Photo: Brian Toland.