

REGIONAL VETERINARY LABORATORIES REPORT

August 2024

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 335 carcasses and 33 fetuses during July 2024. Additionally, 1,466 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 July 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 blackleg were the most common diagnoses at necropsy in cattle in the RVLs during August 2024.

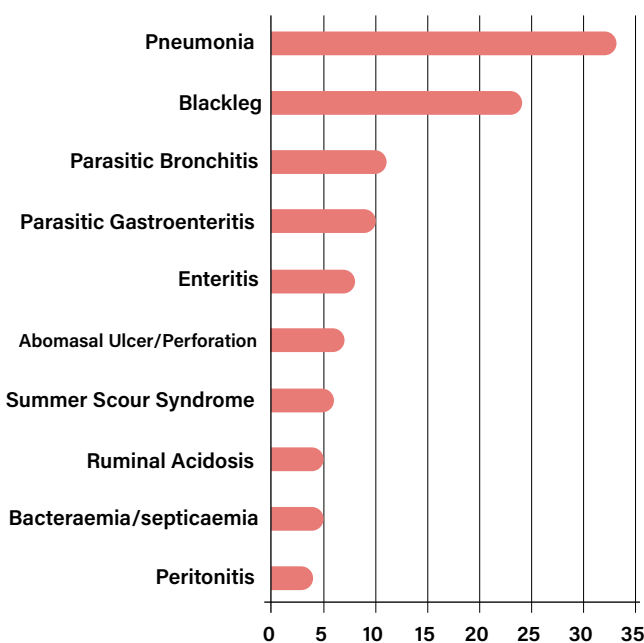


Table 1: The most common diagnoses in cattle submitted for necropsy in August 2024.

Gastrointestinal Tract

Parasitic gastroenteritis

Limerick RVL examined a six-month-old Aberdeen Angus cross heifer weanling that was found collapsed and dehydrated and did not respond to treatment. Post-mortem examination revealed heavy faecal staining of the tail and hindquarters, and a severe proliferative and necrotising abomasitis with marked cobblestone appearance of the mucosa; the small intestinal wall was thickened with inflammation of the mucosa and a sparse quantity of bloody contents. A 'cobblestone' or 'Morocco leather' appearance of the abomasal mucosa is suggestive of parasitism, and there was a strongyle count in excess of 20,000 eggs per gram (EPG) and a heavy burden of coccidial oocysts. A diagnosis of parasitic gastroenteritis (PGE) and coccidiosis was made. Coccidial oocyst burdens in cattle and sheep should be interpreted with caution; some coccidial species are non-pathogenic or weakly pathogenic and are capable of

producing massive numbers of oocysts. Coccidiosis cannot be diagnosed based solely on the finding of faecal oocysts and the clinical presentation and history should also be considered.



Figure 1: 'Cobblestone' or 'Morocco leather' appearance of the abomasal mucosa in a case of chronic parasitic gastroenteritis. Photo: Brian Toland.

An eight-month-old weanling presented to Kilkenny RVL with a history of ill thrift. On post-mortem examination, the abomasal mucosa was hyperaemic with a multinodular appearance suggestive of hyperplastic glands. The large intestinal contents were fluid. On histopathological examination, there was hyperplasia of mucous neck cells and lymphocytic inflammation. These changes are typically associated with parasitism. A McMaster's faecal egg count examination revealed 2,400 EPG. An immediate review of anthelmintic control and pasture management was advised.



Figure 2: Inflamed, oedematous abomasal mucosa. Photo: Brian Toland.

Abomasitis

A ten-day-old Belgian Blue bull calf that had been born via a breech birth was submitted to Limerick RVL. The calf appeared to recover, then deteriorated on the day before it died with no response to treatment. On external examination, there was bloat and an infected swollen umbilicus; post-mortem examination did not reveal any evidence of fractured ribs or trauma from calving. The main finding was in the abomasum, where the mucosa were inflamed with marked oedema and filled with dark red/black watery contents. Histopathology revealed an abomasitis with *Sarcina* sp. present, these are fastidious Gram-positive anaerobic bacteria that occur in cubical packets of eight or more cells. Calves with *Sarcina* sp. are often found dead or dying after a short illness characterised by bloat. They proliferate when there is an excess of fermentable carbohydrate within the abomasum (such as following ingestion of a large volume of milk). *Sarcina* require special conditions and substances for their growth and are difficult to grow in laboratories hence are most commonly diagnosed on histopathology. No other pathogens were detected in this case. Until more is known of the specific risk factors for the involvement of *Sarcina* species, 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.

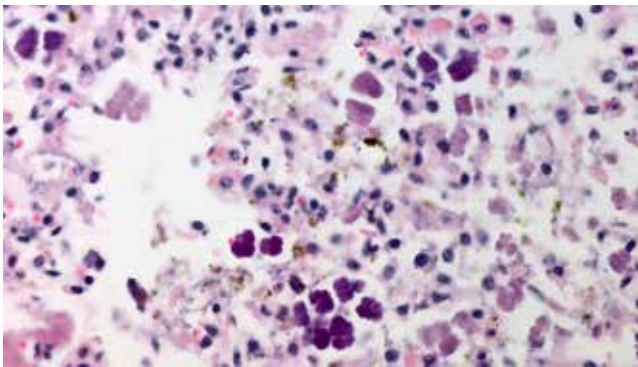


Figure 3: *Sarcina* sp. bacteria in their characteristic tetramers. Photo: Brian Toland.

Perforated abomasal ulcer

Sligo RVL examined the carcass of a two-month-old calf which had been found dead. On post-mortem examination, there was a large, perforated abomasal ulcer, approximately 10cm in size, and severe peritonitis. Abomasal contents were present in the abdomen. A significant number of ticks was noted on the surface of the carcass; *Anaplasma phagocytophylum* was detected by polymerase chain reaction (PCR) and *Streptococcus* sp. was cultured from the kidney. The perforated abomasal ulcer leading to peritonitis and likely bacteraemia or septicaemia was diagnosed as the most immediate cause of death in this calf. There was underlying, and potentially pre-disposing, *A. phagocytophylum* (tick-borne fever agent) present.



Figure 4: Abomasal ulcer in a calf which has become perforated. Photo: Rebecca Froehlich-Kelly.

Tick-borne fever

A. phagocytophylum, the causative agent of tick-borne fever (TBF) is classified as a member of the order Rickettsiales, family Anaplasmataceae. Clinical symptoms of TBF include: depression, anorexia, fever (>40°C) and milk drop. The organism infects neutrophils, eosinophils, and monocytes. It is considered to play a significant immunosuppressive role, and infected animals are more susceptible to pasteurellosis, tick pyaemia, systemic listeriosis, and louping-ill disease.

Summer scour syndrome

A seven-month-old Friesian weanling was submitted to Kilkenny RVL with a history of chronic diarrhoea that was unresponsive to treatment. Two cases were reported in the herd. On post-mortem examination, there was a chronic ulcer on the tongue. There were multifocal areas of hyperaemia on the oesophagus and multifocal oesophagitis. The mucosa of the abomasum was focally hyperaemic. The intestinal content was very liquid. There were no significant findings on laboratory tests. Based on histopathology and gross findings, a diagnosis of summer scour syndrome was considered likely.

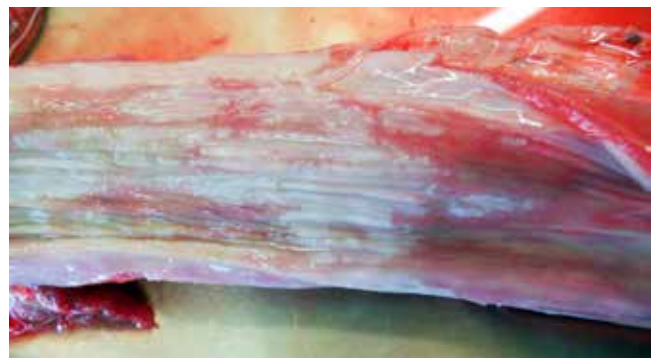


Figure 5: Oesophagitis in a case of summer scour syndrome. Photo: Aileen Kennedy.

Bovine diarrhoea virus

A four-and-a-half-year-old Friesian cow was submitted to Limerick RVL with a history of scour, pneumonia, and inappetence; *Salmonella* and PGE was suspected. Post-mortem revealed a dark brown abomasal mucosa with multifocal pinpoint ulcers. The small and large intestine contained watery green ingesta; liver had fluke tracts

present but no visible fluke. Lungs were heavy with multifocal areas of ground glass emphysema in the caudal lobes. Routine culture was negative for *Salmonella* and no evidence of strongyles, fluke or lungworm was detected in intestinal contents. Interstitial pneumonia is suggestive of viruses or lungworm; bovine respiratory syncytial virus (RSV), bovine herpesvirus 4 (BHV4) and bovine diarrhoea virus (BVD) were detected by PCR. BHV-4 has been associated with several clinical syndromes, including pneumonia, metritis, vaginitis, and abortions in synergism with other pathogens. This herd is located in an area where there was an outbreak of BVD in the spring, the herd has been restricted and neighbouring farms notified. It is important to remain vigilant to the threat posed by transient/acute BVD infections especially in naive animals.

Respiratory Tract

Bovine tuberculosis

Limerick RVL detected suspected tuberculous lesions in three six-month-old Friesian heifer calves from a dairy farm with a bovine tuberculosis (TB) breakdown. The recent single intradermal comparative tuberculin test (SICTT) skin test had disclosed 17 reactors which included these calves. The Regional Veterinary Office had referred the animals for post-mortem examinations. On gross examination, three of the calves had caseous lesions in the bronchial or mediastinal lymph nodes. One calf also had a focal abscess in the right cranial lung lobe. *Mycobacterium bovis*, the causative organism of TB, was isolated from all three of these calves.



Figure 6: A caseous lesion (left) in a mediastinal lymph node which has been bisected longitudinally, in a case of bovine tuberculosis. Photo: Alan Johnson.

Urinary/Reproductive Tract

Decomposed foetus

An adult cow was submitted with a history of diarrhoea and lack of response to treatments by farmer. On post-mortem, a decomposed foetus was discovered in the uterus with an associated metritis.



Figure 7: A decomposed foetus was discovered in the uterus with an associated metritis. Photo: Maresa Sheehan.

Vegetative endocarditis and renal infarct

A nine-year-old cow was presented to Kilkenny RVL with a history of ill thrift. A large vegetative mass was seen on the tricuspid valve, and a diagnosis of vegetative endocarditis was made. *Trueperella pyogenes* was cultured from the mass and from multiple organs indicating a septicaemia. A sequel to this, renal infarction, was observed. Note the wedge shape of this zone of coagulative necrosis resulting from loss of blood supply with resultant tissue ischaemia that produces the pale infarct. On histopathology, there were multifocal areas of coagulative necrosis surrounded by a rim of inflammatory cells.

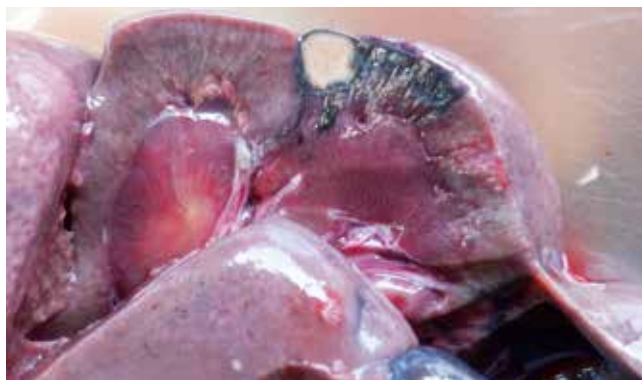


Figure 8: A renal infarct, likely a sequel to vegetative endocarditis. Photo: Lisa Buckley.

Cardiovascular System

Vena cava thrombosis

A four-year-old cow presented to Kilkenny RVL with a history of sudden death. On post-mortem examination, there was a large abscess within the liver parenchyma eroding into the caudal vena cava, with a secondary septic embolic pneumonia. *T. pyogenes* was cultured from multiple organs. A diagnosis of vena cava thrombosis was made. The most common cause is ruminal acidosis leading to rumenitis and subsequent liver abscessation, which may result in a thrombus in the caudal vena cava if the vessel wall is infiltrated by the abscess. The condition usually occurs in adult dairy cattle or in feedlot cattle on high-carbohydrate diets. Presenting signs can be acute, manifested by respiratory distress, or chronic, manifested by weight loss and chronic coughing. Control efforts should focus on reducing the incidence of ruminal acidosis, so a review of diet was advised in this case.

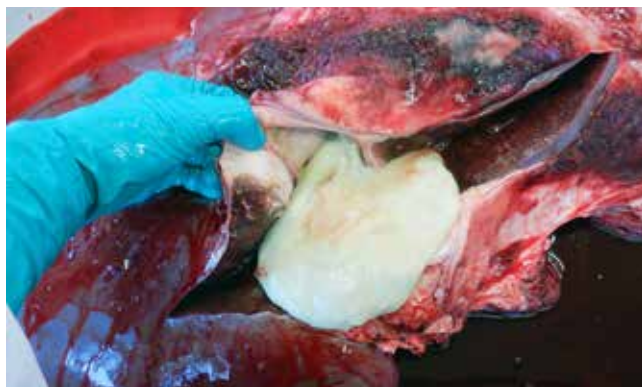


Figure 9: A hepatic abscess eroding into the caudal vena cava. Photo: Lisa Buckley.

Chronic pericarditis and endocarditis

A five-year-old dairy cow, which was two months calved, was found with a swollen abdomen 10 days previously and was treated by the vet twice but there was no response, and she died. Another cow had previously been diagnosed with 'hardware disease', or traumatic reticulitis, in the UCD School of Veterinary Medicine. At necropsy in Athlone RVL, there was marked subcutaneous oedema of the head, ventral chin, neck, brisket and ventral abdomen caudal to the mammary gland. There was a massive volume of ascitic fluid and hydrothorax and marked bowel oedema. There was a diffuse chronic fibrinous/restrictive pericarditis and vegetative endocarditis lesion in the left atrio-ventricular (AV) valve. There was a pronounced 'nutmeg' pattern in the liver. A conclusion of chronic fibrinous pericarditis and vegetative endocarditis leading to congestive heart failure was made. Although the cause of this pathology was suspected to be a sharp penetrating object (hardware disease) no foreign body was located (not uncommon in such cases).



Figure 10: Chronic fibrinous pericarditis. Photo: Denise Murphy.

Nervous System

Cerebrocortical necrosis

Sligo RVL diagnosed cerebrocortical necrosis (CCN) in a six-month-old calf which had been found dead without any prior signs of sickness. On post-mortem examination, severe dehydration was apparent. Intestinal contents appeared haemorrhagic. The brain appeared mildly swollen and presented with laminar fluorescence under ultraviolet A (UVA) light. On histopathology there was polioencephalomalacia with laminar necrosis, neuronal necrosis, and mild meningo-encephalitis.

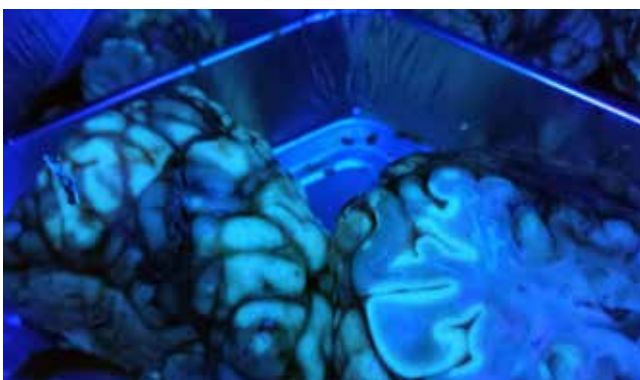


Figure 11: Laminar fluorescence in the brain of a calf in a case of cerebrocortical necrosis. Photo: Rebecca Froehlich-Kelly.

Musculoskeletal

Blackleg

There were several cases of Blackleg or clostridial myositis diagnosed in cattle in Sligo RVL. Histories mainly described sudden deaths and, in one case, lameness. On post-mortem examination, there was a distinctive odour and areas of dry, necrotising myositis present. *Clostridium chauvoei* (Blackleg) and *Clostridium septicum* (Clostridial myositis) could be identified in those cases using fluorescent antibody technique (FAT).

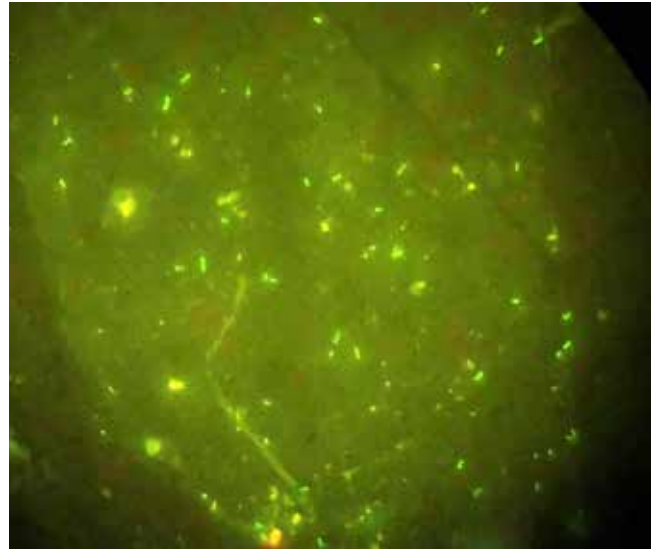


Figure 12: A positive fluorescent antibody technique for *Clostridium chauvoei*. Photo: Aideen Kennedy.

Two weanlings with pneumonia-like symptoms and high temperatures were submitted to Kilkenny RVL. Both weanlings had multifocal areas of dark, emphysematous, black-coloured muscle, mainly affecting the gluteals and muscles in the shoulders. Both also had areas of inflammation in the myocardium. *C. chauvoei* (blackleg) FAT tests were positive in both, and a review of vaccination protocols was advised.

A press release alerting vets and farmers to the increased number of cases, and the value of vaccination, was released to multiple media outlets.

Increased prevalence of large outbreaks of blackleg reported by RVLs

During July and August 2024, the RVLs noted a sharp increase in the prevalence of blackleg (*C. chauvoei*) diagnoses in cattle referred to them for post-mortem, including some quite large outbreaks in farms around the country with no prior history of the disease. Blackleg is a common disease of cattle worldwide, causing acute muscle damage and usually seen as either sudden death, or death after a short illness. The disease is caused by the consumption of clostridial spores from soil, which remain dormant in muscle until bruising, torn muscles, or metabolic factors cause the conditions in the local tissues that allow the spores to germinate, and cause the disease, normally with fatal consequences. Affected animals are often found dead.

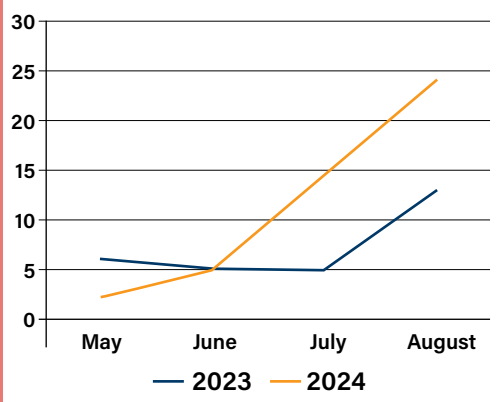


Table 2: Blackleg diagnoses in the RVLs from May to August during 2023 and 2024.

Gastrointestinal Tract

Parasitic gastroenteritis

Limerick RVL examined a three-month-old, recently-weaned lamb at grass, one of five that had died from a group of 40. The history was of weakness and diarrhoea. On necropsy, the lamb was in poor body condition and there was heavy faecal soiling of the perineal area. There was diffuse thickening of the abomasal mucosa and very watery small and large intestinal contents. The strongyle egg count was very high and a large number of coccidial oocyst were also seen. An urgent review of the parasite control programme was recommended.

Haemonchosis

Athlone RVL examined a three-month-old lamb from a farm where there had been three lambs lost in the previous two days. There was facial and submandibular oedema with a markedly pale carcass and pronounced pallor of the ocular conjunctiva. There was marked pericardial and thoracic effusion with severe ascites. Upon inspection of abomasum, myriad *Haemonchus contortus* worms were identified within the abomasal contents and across the markedly oedematous abomasal rugal folds. Reported clinical signs are related to the blood-feeding activities of this parasite and can include anaemia, tachycardia, increased respiratory rate, and weakness. *H. contortus* can present in flocks as peracute deaths due to the ingestion of large numbers of infective larvae in a short period of time. In subacute infections, the submandibular oedema (bottle jaw) that develops can resemble fasciolosis. Due to its high biotic potential, large burdens of *H. contortus* may develop quickly under the right conditions, leading to outbreaks of haemonchosis. Athlone RVL has investigated several cases of haemonchosis this year across both ewes and lambs.



Figure 13: High numbers of *Haemonchus contortus* on the abomasal mucosa of a lamb. Photo: Aoife Coleman.

A four-month-old lamb was found dead and submitted to Kilkenny RVL. On examination, *H. contortus* parasites were visible in the abomasum. In addition, there was a fibrin clot in the pericardial sac. Samples were positive for *Clostridium perfringens* epsilon toxin. A review of vaccination protocols was advised, along with examination of cohorts for signs of anaemia and a review of parasite control.

While this is typically a disease that is more common in the summer, the factors underlying the current sharp increase in cases are not clear, but heavy summer rainfall can possibly play a role in increasing soil intake by grazing animals on saturated pasture, increased 'poaching', and by bringing the buoyant clostridial spores to the surface in pasture as the spores can remain viable for decades, perhaps centuries. While the factors causing these large outbreaks are unclear, prevention is very straightforward, as multivalent clostridial vaccines are extremely effective when used properly, with several brands and suppliers to choose from.

It is important to follow manufacturers' instructions on the primary course and booster regime, which is simple to implement, but crucial to ensure maximum effectiveness. Consult your veterinarian for specific advice on diagnosis and prevention of blackleg on your farm.

Sheep

Parasitic gastroenteritis and clostridial enterotoxaemia were the most common diagnoses at necropsy in sheep in the RVLs during August 2024.

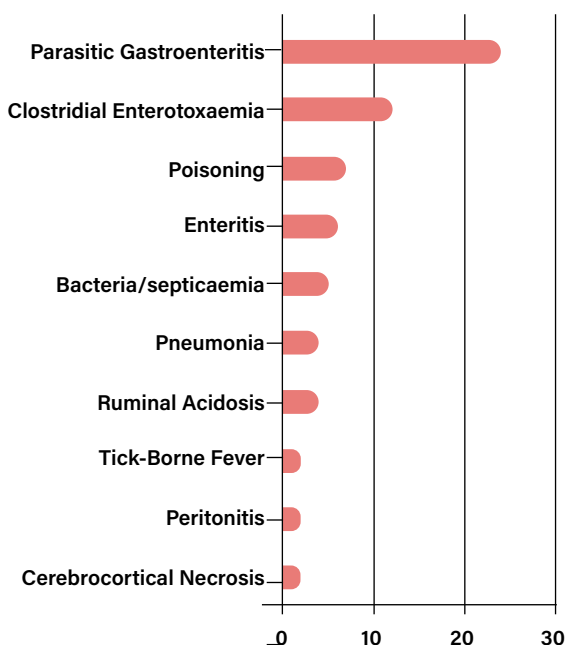


Table 3: The most common diagnoses in sheep submitted for necropsy in August 2024.

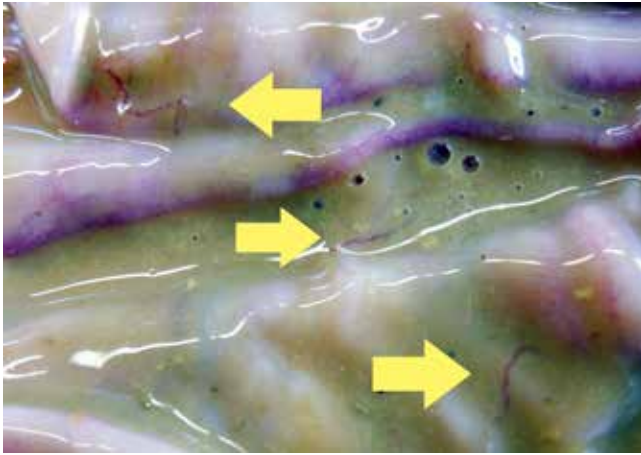


Figure 14: *Haemonchus contortus* (yellow arrows) with characteristic 'barber's pole' appearance. Photo: Aideen Kennedy.

Sligo RVL diagnosed *H. contortus* in several cases of parasitic gastroenteritis in submissions from the north-west region. The animals were described as dull prior to death. On post-mortem examination, there was severe anaemia, subcutaneous oedema, and bottle jaw. Opening of the abomasum revealed large numbers of nematodes with the distinctive barber pole pattern. These cases highlight that *H. contortus* is now also a significant parasite in the north-west of Ireland, likely to be favoured by the current climate, in particular, the mild winters, which favour overwintering larval survival on pasture.



Figure 15: 'Porcelain-white' mucous membranes indicative of severe anaemia caused by *Haemonchus contortus*. Photo: Rebecca Froehlich-Kelly.

Ruminal acidosis

Two ewes were submitted to Kilkenny RVL with a history of sudden death. They had been recently introduced to concentrates in preparation for the breeding season. Very low pH values in the ruminal contents were detected from both, 3.9 and 4.5, where the normal range is 5.5 to 7.



Figure 16: Grain-filled ruminal contents with a pH of 3.9. Photo: Maresa Sheehan.

Respiratory Tract

Jaagsiekte/Ovine pulmonary adenocarcinoma

Athlone RVL examined a three-year-old ewe with a history of sudden death. There was a white, firm, tumour-like mass in the left cranial lung lobe, 10 x 12cm in size, and multifocal petechial haemorrhages throughout the remaining lung lobes and scattered, pinpoint, firm foci in caudal lobes. Histopathology showed the alveoli were lined by cuboidal or columnar neoplastic epithelial cells in acinar structures. A PCR test for Jaagsiekte sheep retrovirus was positive, confirming the diagnosis of ovine pulmonary adenocarcinoma (OPA). OPA is a contagious pulmonary tumour of sheep. Regular flock inspection with prompt isolation and culling of thin and/or dyspnoeic sheep may identify early clinical cases and slow the spread of infection. The offspring of affected sheep frequently develop OPA and should not be kept as replacement stock.



Figure 17: Ovine pulmonary adenocarcinoma in the lung of a ewe. Photo: Denise Murphy.

Cardiovascular System

Vegetative endocarditis

The carcass of a four-month-old lamb which had been noticed "failing" and not thriving in the weeks before death was submitted to Sligo RVL. On post-mortem examination, there were extensive vegetative lesions present on the mitral

valve. *Escherichia coli* was cultured from the lesion. *A. phagocytophylum* was detected by PCR. On histopathology, there was focally extensive, chronic, severe, necrotising endocarditis with extensive fibrosis, neutrophils and numerous bacterial colonies. Vegetative endocarditis was diagnosed as most likely cause of death. Tick-borne fever was suspected as an underlying and likely predisposing condition.



Figure 18: Vegetative endocarditis in a ewe. Photo: Aideen Kennedy.

A three-year-old ewe was found dead and submitted to Kilkenny RVL. On necropsy, there was bilateral vegetative endocarditis and pneumonia with multifocal areas of consolidation. In addition, there was mastitis. *T. pyogenes* was cultured from multiple organs indicating a bacteraemia. Vegetative endocarditis typically occurs secondary to another disease process. When the endothelium is partially eroded and underlying collagen exposed, platelets adhere and produce a microthrombus. Blood-borne bacteria can become trapped in this thrombus lattice resulting in a localised infection.



Figure 19: Purulent mastitis, likely a sequel to a blood-borne bacterial infection. Photo: Aideen Kennedy.

Nervous System

Cerebrocortical Necrosis

The carcase of a five-month-old lamb which had appeared sick and dazed on the previous day was presented to Sligo RVL. On post-mortem, there was swelling of the brain which displayed laminar apple green fluorescence under ultraviolet

light indicative of cerebrocortical necrosis (CCN). There was concurrent parasitic gastroenteritis due to strongyle infestation and segmental coccidiosis.

Musculoskeletal

Drenching gun injury

A four-month-old lamb was found dead and submitted to Kilkenny RVL. There had been two other cases of sudden death in the flock. In the oropharynx, and adjacent to the oesophagus, there was a large area of necrosis, abscessation, and haemorrhage. There was a small therapeutic bolus lodged within the lesion. There was a large blood clot within the rumen contents. A traumatic (bolus gun) injury was diagnosed and a review of technique and examination of equipment for sharp edges advised.

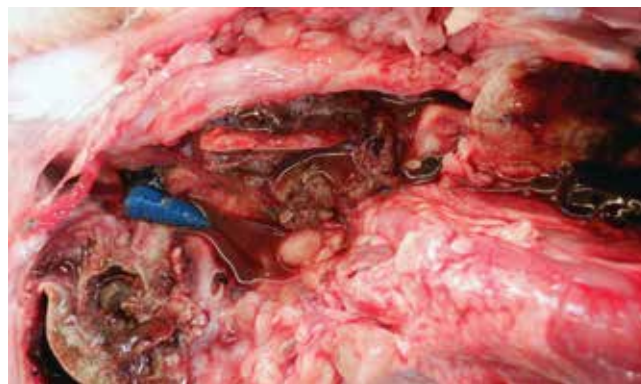


Figure 20: A blue bolus lodged in tissue adjacent to the oesophagus. Photo: Aideen Kennedy.

Athlone RVL examined a two-month-old lamb with a history of ill thrift for two weeks prior to death. It was the second lamb from the group to die in a few days. There was a ruptured abscess in the right pharynx and necrotic pharyngeal tissue. *E. coli* was isolated from the lesion. There was pulmonary congestion and soft intestinal contents and faeces. There was a strongyle egg count of 2,200 EPG in the faeces. A diagnosis of necro-suppurative pharyngitis was made, most likely as a result of a dosing gun injury as the lambs had been dosed a fortnight earlier. The flock owner was advised to review his dosing technique and examine/replace his dosing equipment. A review of the parasite control programme on the farm was also advised.

Rabbit

Rabbit haemorrhagic disease

Limerick examined a two-year-old Netherland Dwarf pet rabbit, one of three that had died over a five-day period. The rabbits were kept in a cage but had access to the back garden of a house in a small town during the day. Clinical signs included: depression, inappetence and convulsions before death. Post-mortem findings were unremarkable. On histopathology, lesions of multifocal single cell and larger multifocal coalescing areas of necrosis affecting all zones of the liver were seen. The findings were consistent with rabbit haemorrhagic disease (RHD). This was confirmed on PCR. RHD is a highly contagious viral disease with morbidity and mortality rates of up to 90 per cent. Transmission follows contact with other infected rabbits or via indirect contact with mechanical vectors. In this case, it was suspected that contact may have occurred with a wild infected rabbit in the garden.

Poultry

Red mite infestation

A six-month-old Rhode Island Red hen from a backyard flock of six hens was submitted to Limerick RVL. This was the second hen to die, from a group that had been bought a few months previously. The owner noted the combs and faeces were pale in colour, and the birds were reluctant to enter the hen house and inappetent. On external examination, the hen was in poor condition with a heavy burden of red mites and pale skin and muscles. A diagnosis of red mite infestation causing anaemia and death was made, there were no other pathogens identified and testing for avian influenza returned a negative result. Poultry red mites are nocturnal feeders that hide during the day under manure, on roosts, and in cracks and crevices of the hen house, where they deposit eggs. Populations develop rapidly during the warmer months and more slowly in cold weather. The life cycle may be completed in only one week. A house may remain infested for up to nine months after birds are removed. Once poultry has been infested, control may be achieved by spraying or dusting the birds and litter, and by targeting the inside of the house and all hiding places for poultry red mites with insect smoke tablets. Systemic control with ivermectin (1.8-5.4mg/kg) or moxidectin (8mg/kg) is effective for short periods, but the high dosages are expensive, close to toxic levels, and require repeated use.



Figure 21: Poultry mites infesting the skin and feathers of a Rhode Island Red. Photo: Brian Toland.

Wildlife - Raptors

Rodenticide poisoning

A Red Kite (*Milvus milvus*) found dead at the side of a road was submitted to Limerick RVL by the National Parks and Wildlife Service (NPWS) following an X-ray which did not reveal traumatic injury or any gunshot pellets. The bird appeared in good condition with no visible lesions or evidence of trauma. Necropsy revealed the remains of a rodent in the crop. A liver sample was analysed by the State Laboratory which detected elevated levels of brodifacoum, difenacoum and flocoumafen. These are highly-lethal Vitamin K antagonist anticoagulant poisons typically used as rodenticides. A diagnosis of rodenticide poisoning was made.



Figure 22: A Red Kite, diagnosed with poisoning by rodenticide. Photo: Brian Toland.