REGIONAL VETERINARY LABORATORIES REPORT

October 2024

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 888 carcases and 83 foetuses during March 2024. Additionally, 1,868 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 the cases investigated by the Department of Agriculture, Food and the Marine's (DAFM) veterinary laboratories in October 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.
In addition, this month's report contains advice on using laboratory diagnostics to investigate bovine neonatal enteritis.

Cattle

Pneumonia, blackleg, and enteritis were the most common diagnoses at necropsy in cattle in the RVLs during October 2024.

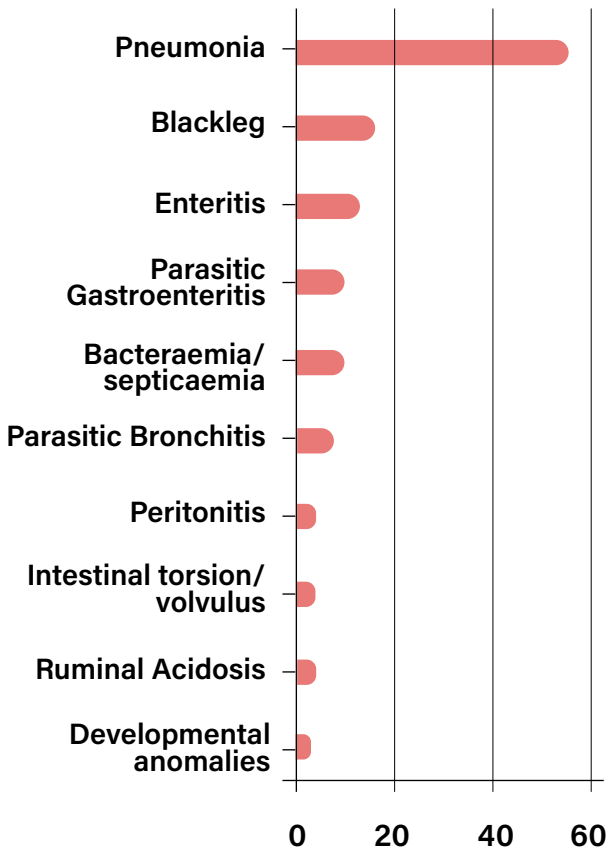

Table 1: The most common diagnoses in cattle submitted for necropsy in October 2024.

Gastrointestinal Tract

Haemorrhagic abomasal ulcer

A 5-year-old Friesian cow was submitted to Limerick RVL, the cow was described as "slow in herself" at morning milking and was found recumbent later in the day and died shortly afterwards. Necropsy revealed two non-perforating abomasal ulcers measuring 9cm x 5cm and 5cm x 3cm with severe intraluminal haemorrhage. There were no significant findings in laboratory tests, a diagnosis of haemorrhage due to abomasal ulceration was made.

Figure 1: Abomasal ulcer which had become haemorrhagic. Photo: Brian Toland.

Many causes have been suggested for abomasal ulceration such as infections, stress, prolonged use of non-steroidal anti-inflammatory drugs (NSAIDs), mineral deficiencies, and diet, but it is not well understood. Although abomasal ulcers can occur at any time during lactation, they are common in high-producing, mature dairy cows within the first six weeks after parturition (stress associated with negative energy balance). One cause may be a prolonged inappetence, which results in sustained periods of low abomasal pH. Other theories suggest high nitro fertiliser application or ulcers may be pre-existing, possibly from calfhood.

Hepatic abscessation

Sligo RVL examined the carcase of an 18-month-old heifer which had been found dead without previous clinical signs. On post-mortem examination, there was liver abscessation with extensive peritonitis and fibrinous adhesions to the diaphragm. DNA specific to *Anaplasma phagocytophyllum*, the causative organism of tick-borne fever, was detected. *Trueperella pyogenes* was cultured from abscess material. The concurrent tick-borne fever was likely predisposing to the bacterial infection causing the abscessation.

Respiratory Tract

Figure 2: Tracheitis in a case where IBR was diagnosed. Photo: Aideen Kennedy.

Pneumonia

A 10-month-old weanling with respiratory signs did not respond to treatment and was submitted to Kilkenny RVL. On necropsy, the tracheal mucosa was very congested. There was cranioventral consolidation affecting approximately 35 per cent of lung tissue, and focal areas of the consolidated region that contained microabscessation. Polymerase chain reaction (PCR) testing returned positive results for bovine herpesvirus 1 (BHV1), the causative organism of infectious bovine rhinotracheitis (IBR) and *Mycoplasma bovis. Mycoplasma bovis* is capable of inciting pneumonia alone, or as part of the bovine respiratory disease complex where viral infections incite the initial insult damaging the respiratory mucosa, reducing ciliary activity, and weakening the immune defences of the respiratory tract.

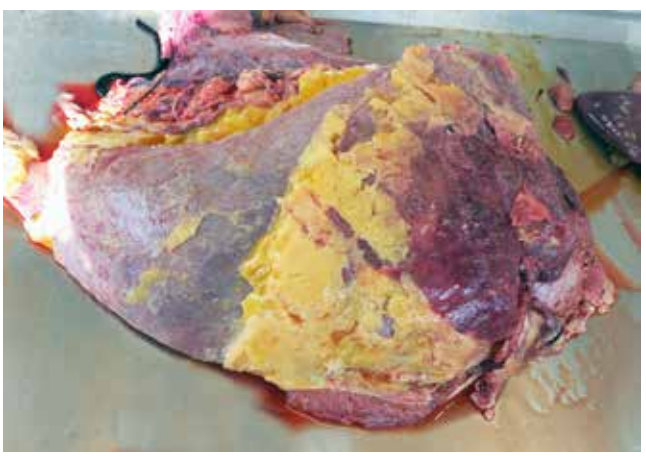

Figure 3: Acute fibrinous pleuropneumonia in a yearling. Photo: Rebecca Froehlich-Kelly.

A yearling calf which had been reported sick for approximately two days before death with recumbency and anorexia was examined in Sligo RVL. On necropsy, there was severe, acute, fibrinous pleuropneumonia predominantly affecting the right lung. There was pericarditis. *Mannheimia haemolytica* and *Histophilus somni* were detected by PCR and cultured from lung tissue. Parainfluenza virus 3 (PI3) was detected by PCR. *A. phagocytophyllum* was detected by PCR. The detected tick-borne fever was presumed to have predisposed to the bacterial infection.

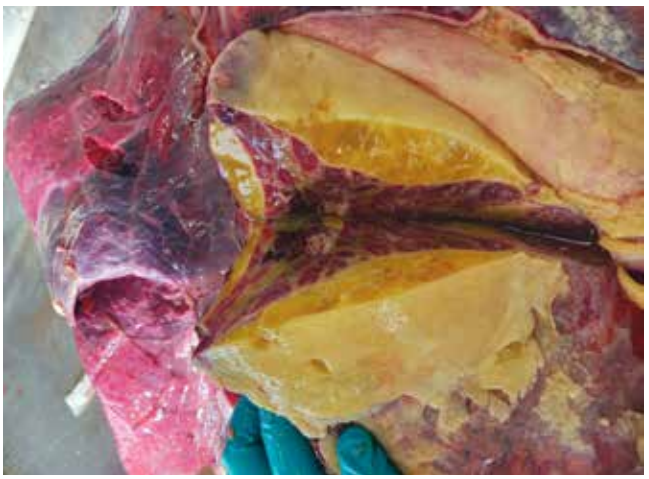

Figure 4: Cross section of fibrinous pleuropneumonia. Photo: Rebecca Froehlich-Kelly.

A Friesian weanling was submitted to Limerick RVL with a history of chronic pneumonia with no response to treatment, *Mycoplasma bovis* was previously detected on the farm and there had been several casualties. Necropsy revealed multifocal areas of 'ground glass' emphysema with congestion and consolidation of cranioventral lobes, with visible and palpable nodular lesions on the surface and in the parenchyma of the lungs; the trachea was inflamed with blood clots present, and the lymph nodes were markedly enlarged. Laboratory findings included PCR positive results for *Mycoplasma bovis, H. somni*, *Pasteurella multocida* and *M. haemolytica*, there was also a significant worm burden of 1,700 eggs per gram and PCR positive results for bovine herpesvirus 4 (BHV4). A diagnosis of severe multifactorial pneumonia was made. 'Ground glass' emphysema is suggestive of bronchiolar obstruction in cattle and is associated with respiratory viruses or lungworm (none were detected). The involvement of BHV4 is most likely in synergy with other pathogens and is very difficult to evaluate the impact of this infection in livestock.

Figure 5: Nodular necrotic areas in lung parenchyma consistent with *Mycoplasma bovis* infection in a case of bronchopneumonia. Photo: Brian Toland.

Sligo RVL examined the carcase of a six-month-old calf with a history of coughing and breathlessness. The farmer had experienced a number of deaths recently in that management group of which one was diagnosed with a severe lungworm (*Dictyocaulus viviparus*) burden. Subsequently, he treated the group for lungworm in the days prior to the death of this animal. On necropsy, there was severe pulmonary oedema and 'ground glass' emphysema.

Figure 6: 'Ground glass' emphysema (arrow) in a case of pneumonia. Photo: Brian Toland.

The cranial lung lobes were consolidated. There was white, thick mucous present in the airways. On histopathology, there was diffuse, severe, chronic, suppurative pneumonia with presence of streaming 'oat cells', viable and degenerate neutrophils in the airways and aveolae, occasional eosinophils, Type 2 pneumocyte proliferation, and oedema and fibrin was present in alveolae. The bronchiolar epithelium was lost or attenuated in several areas and there was thrombosis. There was moderate pleuritis. *H. somni* and *P. multocida* were detected by PCR and culture. Bacterial pneumonia secondary to previous lungworm infection and septicaemia were diagnosed as cause of death. While there were no lungworm larvae observed in lung sections examined, the history and the gross and histopathology findings were suggestive of lungworm infection in the group. This case highlights the severity and potential consequences of lungworm infections even after treatment.

Urinary/Reproductive Tract

Figure 7: Enlarged kidneys in situ. Photo: Rebecca Froehlich-Kelly.

Nephritis

Sligo RVL examined the carcase of a six-month-old calf which had presented with poor growth in the previous months and finally was found recumbent in the field with an elevated temperature. After treatment, it seemed to respond initially but then finally deteriorated and died. On post-mortem examination, both of the kidneys were severely enlarged with multifocal, large abscessation. There were adhesions to intestinal loops and peritonitis. There was bacterial growth on cultures from the kidneys and DNA specific to *A. phagocytophyllum* (the causative agent for tick-borne fever) was detected. On histopathology, there was diffuse, chronic, severe necro-suppurative nephritis with abundant bacteria. Chronic bacterial pyelonephritis and concurrent tick-borne fever was diagnosed.

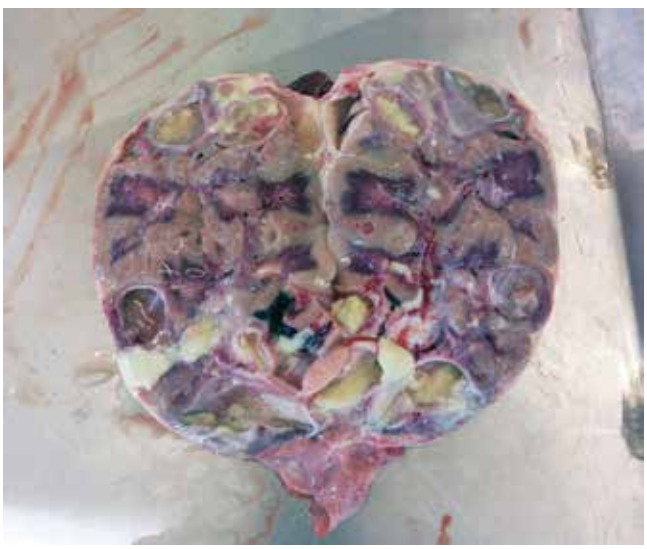

Figure 8: Severe abscessation of the kidney. Photo: Rebecca Froehlich-Kelly.

Mycotic abortion

A bovine foetus was submitted to Kilkenny RVL for investigation. A fungal growth was cultured from stomach contents. Fungal hyphae were seen in the brain of this foetus associated with a severe encephalitis. A number of pathogenic fungi are sporadic causes of abortion and may be associated with the feeding of poorly conserved forage or the use of contaminated bedding. The occurrence of mycotic abortion in cattle is usually sporadic but in exceptional cases may involve 10 per cent of the herd.

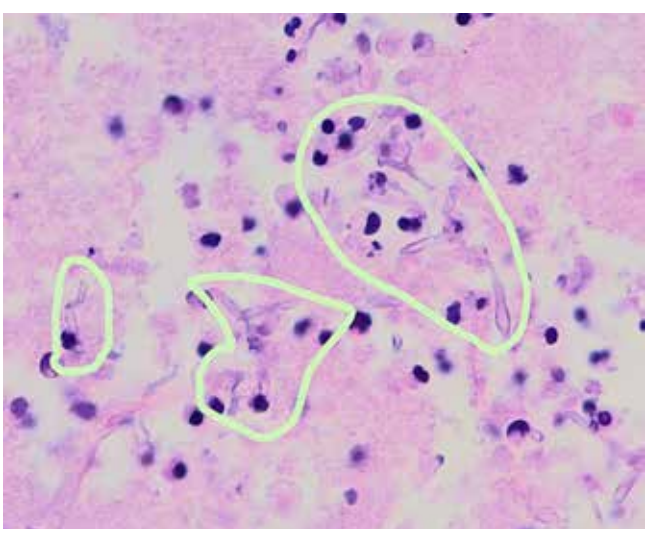

Figure 9: Fungal hyphae (outlined) in the foetal brain. Photo: Maresa Sheehan.

Cardiovascular System

Vena Cava thrombosis

A second-lactation Friesian cow was submitted to Limerick RVL with a history of inappetence and being "off form" for months, the cow had recently shown bilateral epistaxis. On external examination, there were pale mucous membranes with a blood clot in one of the nostrils. Necropsy revealed a large abscess in the body of the liver and in the caudal vena cava.

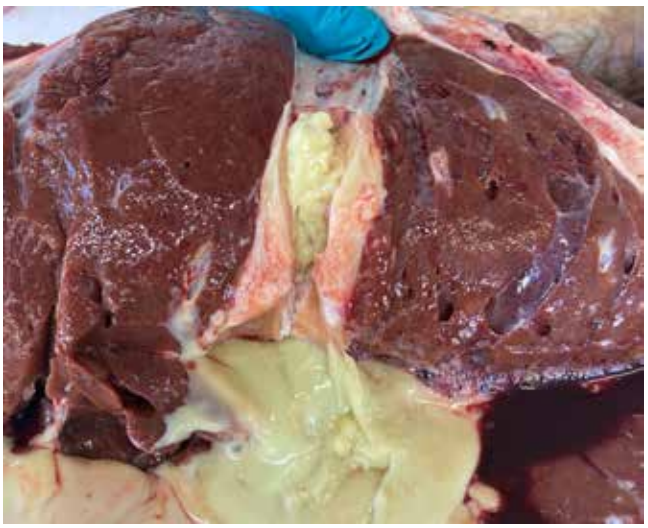

Figure 10: Hepatic abscessation which led to vena cava thrombosis. Photo: Brian Toland.

The lungs were enlarged and heavy with a rugby-ball shaped lesion in the right caudal lobe containing a large blood clot and abscess; multifocal smaller blood clots and abscesses were present throughout the lungs. A diagnosis of hepatic and caudal vena caval abscessation with metastatic pneumonia and haemorrhage was made. Blood clots and haemorrhage are sequela to ruptured aneurysms throughout the lungs resulting from septic thrombi. The most common cause of vena caval thrombosis is ruminal acidosis leading to rumenitis and subsequent liver abscessation, resulting in a thrombus in the caudal vena cava when the vessel wall is infiltrated by the abscess (other diseases with inflammatory foci can also potentially result in a caudal vena caval thrombus). Usually seen in dairy cows on high carbohydrate diets; a review of diet was advised.

Figure 11: Septic pulmonary embolism. Photo: Brian Toland.

Aortic rupture

Athlone RVL examined a yearling bullock that had been noticed to be staying away from the main group at grass and slightly unstable on his feet. The vet was contacted but the animal had collapsed and died before treatment was given. The conjunctivae were pale and there was moderate enophthalmia. There was free blood in the thoracic cavity and a large (30cm x 12cm) blood clot cranial to the heart extending to the thoracic inlet parallel and adjacent to the trachea/oesophagus. On dissection, a ruptured aorta was found. The spleen was moderately enlarged and there was a positive *A. phagocytophyllum* PCR result. Histopathology of aorta showed haemorrhage, fibrin and small aggregates of neutrophils on adventitial surface, consistent with rupture. A conclusion of spontaneous aortic rupture was made. The aetiology of aortic rupture in cattle is uncertain; it may occur sporadically, or it may be associated with a pre-existing aneurysm, and it can occur in association with Marfan syndrome in calves. Aortic rupture occurs in horses following periods of excitement and activity. It has also been linked to copper deficiency in swine.

Figure 12: Aortic rupture. Photo: Denise Murphy.

Babesiosis

A nine-month-old bullock which appeared to have haematuria and died despite treatment, was submitted to Sligo RVL. On post-mortem examination, there was generalised jaundice. There were porridge-like ruminal contents. The spleen was enlarged and friable, and the kidneys blackened. Urine appeared grossly normal; however, urinalysis revealed presence of haemoglobin. Copper concentrations in the renal cortex were elevated. DNA specific to *Babesia divergens* was detected. High worm egg counts were present. Histopathology of the liver showed diffuse vacuolation likely due to hypoxia and multifocal areas of hepatic necrosis and haemoglobin casts were present in the kidney tubules. Babesiosis was diagnosed as the cause of death. The renal copper concentrations are likely due to secondary liver damage and subsequent copper release from hepatocytes.

Musculoskeletal

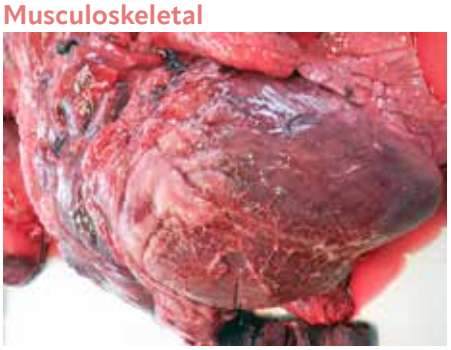

Figure 13: Fibrinous pericarditis in a case of blackleg. Photo: Aideen Kennedy.

Blackleg

A seven-month-old weanling was found dead and submitted to Kilkenny RVL. There was a fibrinous pericarditis, and multifocal areas of dry, black, emphysematous muscle. Fluorescent antibody technique (FAT) results for *Clostridium chauvoei* were positive. Blackleg was diagnosed and a review of vaccination protocols was advised.

Figure 14: Black leg (clostridial myositis). Photo: Aideen Kennedy.

Sheep

Bacteraemia/septicaemia, parasitic gastroenteritis, and pneumonia were the most common diagnoses at necropsy in sheep in the RVLs during October 2024.

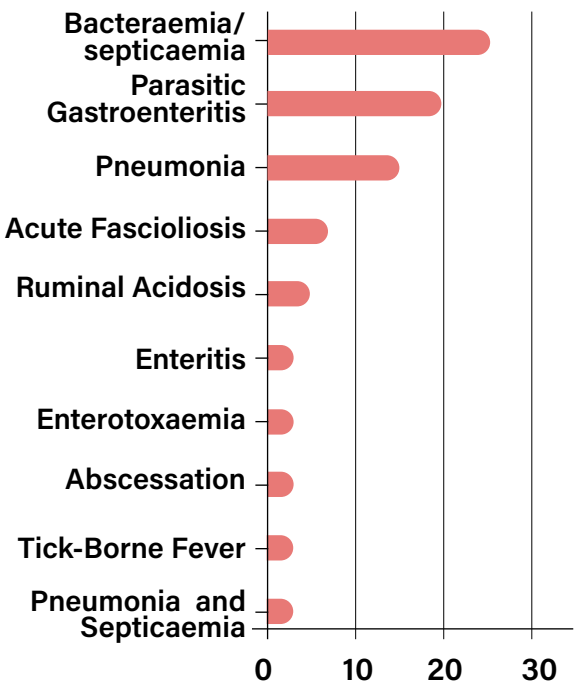

Table 2: The most common diagnoses in sheep submitted for necropsy in October 2024.

Gastrointestinal Tract

Parasitic gastroenteritis

Parasitic gastroenteritis in lambs continued to be an issue in October in Kilkenny RVL, with high strongyle egg counts frequently detected. The photo below shows cross-sections of nematodes in the gastro-intestinal tract (GIT) of a lamb. The use of faecal egg counts together with close observation of sheep for thrive and evidence of parasitic gastroenteritis remains the advice when deciding when to dose.

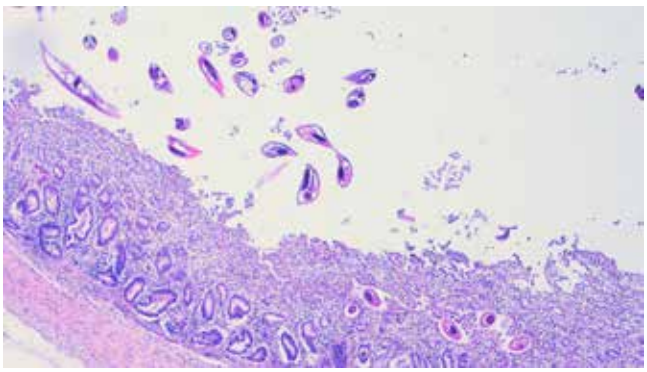

Figure 15: Cross-sections of nematodes in the GIT of a lamb. Photo: Maresa Sheehan.

Intussusception

A six-month-old lamb was submitted to Kilkenny RVL. It had marked faecal staining on its hindquarters. On internal examination, there was an intussusception of the small intestine. On histopathology, the intestines were autolysed but there was crypt abscessation and occasional coccidia visible. On McMaster's testing, there was a light infection of coccidia noted. Peak of clinical signs may not coincide with peak oocyst shedding. Multiple animals should be sampled when coccidiosis is being investigated. Clinical signs of diarrhoea may precede oocyst output and/or may continue after the number of oocysts decrease and, therefore, faecal samples from cohorts were recommended.

Figure 16: An intussusception. Photo: Aideen Kennedy.

Dosing gun injury

A ewe was submitted for post-mortem examination with a history of sudden death, the second in a few days. There was a large, foul-smelling, necro-haemorrhagic lesion on the right side of the caudal tongue and pharynx and there were large blood clots in the rumen, chocolate brown abomasal and intestinal contents, and soft faeces. The animals had been treated for fasciolosis a few weeks previously. A diagnosis of necro-haemorrhagic pharyngitis typical of a 'dosing gun injury' was made. A review of the dosing equipment and technique was advised.

Figure 17: A dosing gun injury. Photo: Denise Murphy.

Clostridial enterotoxaemia/ ruminal acidosis

In another case , a six-month-old lamb was found recumbent and frothing before death. On post-mortem, there was a large pericardial clot. Ruminal pH was 5.1. *Clostridium perfringens* and its epsilon toxin were detected in intestinal contents.

Figure 18: Serous pericardial clot in a case of enterotoxaemia secondary to ruminal acidosis. Photo: Shane McGettrick.

There were several cases of ruminal acidosis submitted to Sligo RVL in October 2024. There was usually concurrent infection with parasites, coccidia, or *C. perfringens* detectable. Ruminal pH < 5.5 post-mortem is considered highly suggestive of ruminal acidosis.

Respiratory Tract

Systemic pasteurellosis

This autumn, Dublin RVL examined several cases of sudden deaths in 2024 spring-born lambs. Their age was between six and nine months old. They were all found dead in the field and farmers reported several losses before presenting them for post-mortem examination. On gross post-mortem examination of all the cases, the lungs were diffusely severely-congested and oedematous. In most of the carcases, there was an ulcerative lesion on the larynx covered by fibrin and/or there were multifocal to coalescing ulcerations covered by fibrin in the oesophagus mucosa; there were multifocal white pinpoint lesions throughout the liver, which was also diffusely congested. *B. trehalosi* was isolated in some cases from the lung and liver, in other cases only from the lung. PCR positive results were obtained for *B trehalosi* in all cases. In some of them, they were also positive for *P. multocida*. Histopathological examination in all the cases: in the liver there was multifocal bacterial hepatitis, and, in the lung, there were multifocal bacterial interstitial pneumonia consistent with bacteraemia and sepsis. In some of the cases there was moderate to high strongyle egg counts detected. 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 *Mycoplasma ovipneumoniae* can cause animals to become susceptible despite appropriate vaccination.

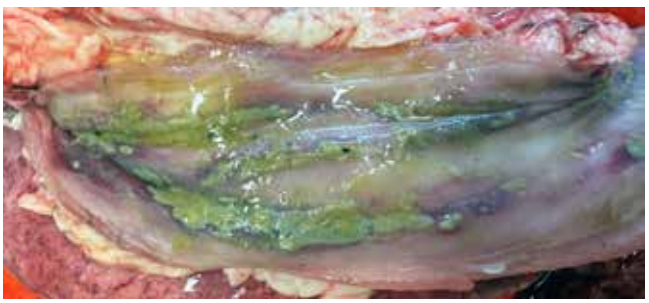

Figure 19: Ulcerative oesophagitis due to systemic pasteurellosis. Photo: Sara Salgado.

Two six-month-old lambs were found dead and submitted to Kilkenny RVL. There had been ten deaths in the flock. One lamb had congested and oedematous lungs. The other lamb had an oesophagitis, pinpoint white foci on the liver and congested lungs. Histopathology of the liver showed multifocal foci of necrosis with bacterial colonies visible. *B. trehalosi* was cultured from multiple organs indicating a bacteraemia.

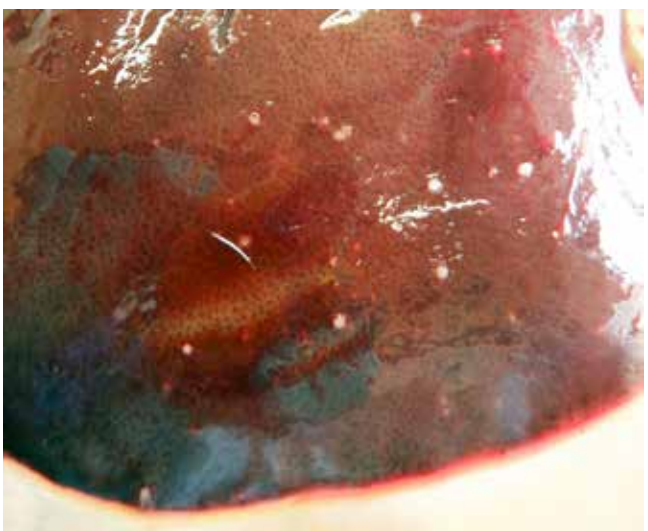

Figure 20: Pinpoint liver lesions due to systemic pasteurellosis. Photo: Aideen Kennedy.

Musculo-skeletal

Poisonings

A six-month-old pet lamb which had been noticed with drooping ears before death was submitted to Sligo RVL.

The lamb had access to poorly conserved silage and cattle concentrate. On post-mortem, there was generalised jaundice. Kidney copper levels were well above the reference range. Copper poisoning was diagnosed as the most likely cause of death. The history was suggestive of cattle concentrates being consumed. These products have significantly higher copper content than feed designed for sheep and access to them frequently leads to copper poisoning in sheep.

Turkeys

Histomoniasis ('blackhead')

Athlone RVL examined a 15-week-old turkey. It was the seventh similar loss, and some of the other turkeys showed slight signs of diarrhoea. The turkey had been treated with antibiotics but there was no response, and it died. On post-mortem examination, the carcase preservation was poor and body condition moderate. There were multifocal target/bullseye type circular lesions throughout the liver. Intestinal contents were loose. *Histomonas meleagridis* life stages were detected in the faecal sample. While the liver was autolysed, histopathology of liver showed severe coalescing areas of lytic necrosis. A conclusion of histomoniasis or 'blackhead disease' was made. The protozoan *H. meleagridis* infects a wide range of gallinaceous birds and causes histomoniasis ('blackhead disease'). Chickens are typically subclinical carriers, but mortality rate in turkeys is commonly 80 per cent to 100 per cent. Clinical signs include drooping head and wings, prolonged standing, closed eyes, ruffled feathers, emaciation, and sulphur-coloured faeces. The diagnosis is based on pathognomonic ulceration of the ceca and necrotic lesions in the liver. There are no approved treatments or vaccines.

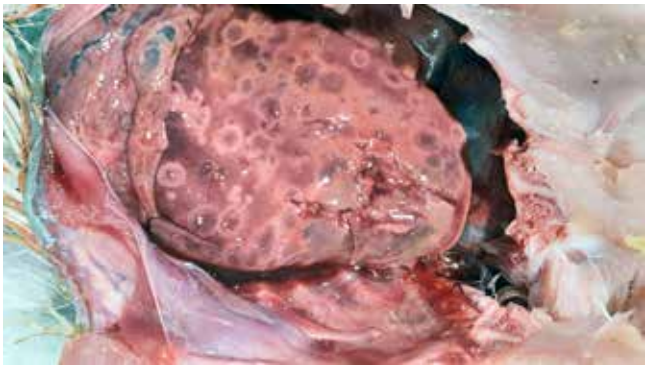

Figure 21: Target/bullseye lesions of histomoniasis in the liver of 15-week-old turkey. Photo: Denise Murphy.

Using Laboratory Diagnostics to investigate Neonatal Enteritis

When performing an investigation of neonatal enteritis on farm it is advisable to submit samples from a number of affected animals. Animals that have been sick or that have received treatment for a prolonged period of time are not suitable candidates for sampling. Ideally, three to five diarrhoea samples should be collected from **early, affected, and untreated calves**. Faecal samples should only be submitted in screw-top plastic containers (Figure 19). In addition, blood samples (serum/red top) should be submitted to check if there has been adequate passive transfer of maternal antibodies from colostrum to the calf. Five to ten blood samples should be taken from calves aged less than ten days old, and these samples should not be collected from sick animals.

Figure 22: Suitable screw-top plastic container for neonatal faecal samples.

If in doubt about sample selection, contact the laboratory directly for advice.