Regional Veterinary Laboratories Report

June 2022

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 337 carcases and 23 foetuses during June 2022. Additionally, 1,360 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 June 2022.
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 enteritis were the most common diagnoses from necropsies in cattle in the RVLs during June 2022.

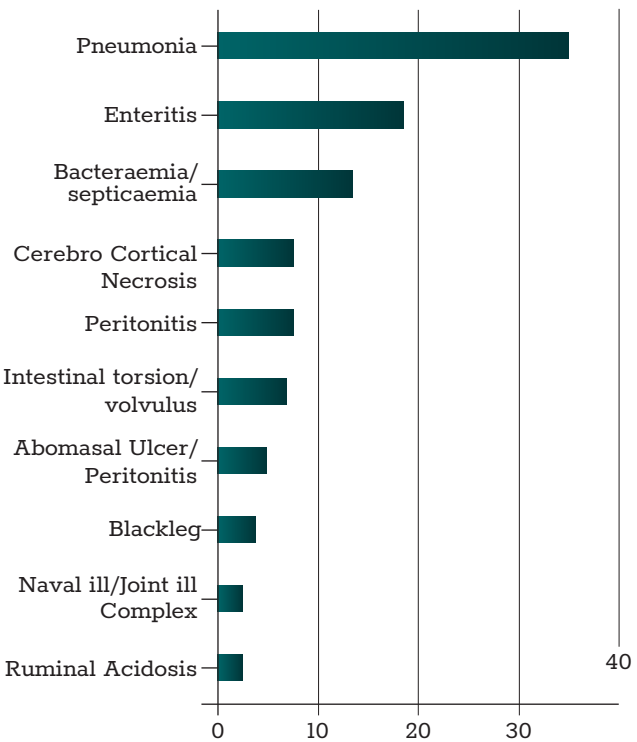

Table 1: The most common diagnoses in cattle submitted for necropsy in June 2022.

GASTROINTESTINAL TRACT

Summer scour syndrome

A six-month-old Friesian heifer calf was submitted for necropsy to Limerick RVL with a history of diarrhoea. Necropsy disclosed poor body condition, buccal ulceration and extensive ulceration of the oesophageal mucosa. Ulceration of the rumen pillars and liquid intestinal contents were observed. Gross findings and history were consistent with summer scour syndrome. Summer scour syndrome or upper alimentary ulcerative syndrome presents as weight loss and rapid onset diarrhoea in weaned calves in their first grazing season. Oral and oesophageal ulceration and necrosis can be a feature in some cases. The aetiology is currently unclear. There have been increasingly frequent reports over the last number of years and an association between inadequate ruminal development prior to weaning and turnout to grass has been suggested as a possible cause, and further research is ongoing. Grazing of lush pasture is a common finding.

RESPIRATORY TRACT

Pneumonia

A five-month-old Friesian bull calf was submitted for necropsy to Limerick RVL with a history of sudden death. Five similar deaths occurred the previous week. Necropsy disclosed severe pneumonia, involving 70 per cent of the lung parenchyma. The cranial and middle lung lobes were primarily affected. Some consolidation and nodular lesions were suggestive of *Mycoplasma bovis* involvement. No lungworm larvae were seen in the airways and *Histophilus somni* was isolated from the lungs.

Pneumonia and abomasitis

Athlone RVL examined a four-month-old Friesian calf that had developed diarrhoea, had been housed and given oral sulphadimidine powder and electrolytes. Summer scour was suspected, there was no response to treatment and the calf died overnight. At gross post-mortem, body condition was moderate, with a bodyweight of 90.5kg. The tail was faecally soiled. There was a severe, diffuse, fibrinosuppurative pleurisy and anteroventral pulmonary consolidation, and the liver was enlarged. No ulceration was noted in the oral cavity or gastrointestinal tract (GIT). The abomasal mucosa was hyperaemic and there was moderate abomasal fold oedema. Intestinal contents were loose and green, and faeces were loose. *Mannheimia haemolytica* was isolated from the lung, faecal egg count parasitology was negative. Histopathology of the lungs showed a multifocal necro-haemorrhagic, fibrinous bronchopneumonia with vasculitis consistent with *Mannheimia sp* infection. The abomasum showed apparent mucus hyperplasia and metaplasia. A conclusion of an acute fibrinous pleurisy and bronchopneumonia was made; parasitic abomasitis was also suspected as there were some changes in the abomasum that were suggestive of parasitism, but summer scour syndrome could not be ruled out.

Figure 1: Severe, diffuse, fibrinosuppurative pleurisy and anteroventral pulmonary consolidation from which *Mannheimia haemolytica* was isolated. Photo: Denise Murphy.

URINARY/REPRODUCTIVE TRACT

Figure 2: Omphalophlebitis, or navel ill, visible upon cross section through the umbilicus. Photo: Denise Murphy.

Navel ill/joint ill complex

Athlone examined a one-month-old suckler calf that had stopped sucking the cow and became dehydrated, didn't respond to treatment and died. On gross post-mortem examination, the umbilicus was enlarged and infected and the infection had tracked along the umbilical vessel to the liver, and there was a mild fibrinous peritonitis. The liver was markedly enlarged and rounded, and there were multifocal pinpoint foci of necrosis throughout a large part of the liver surface and parenchyma, some coalescing to larger areas of necrosis on cross section. Intestinal contents were pasty, and the joints were unremarkable. *Trueperella pyogenes* was isolated from the liver. A diagnosis of hepatic necrosis secondary to omphalophlebitis (navel infection) was made. Advice was given regarding colostral management and hygiene at calving.

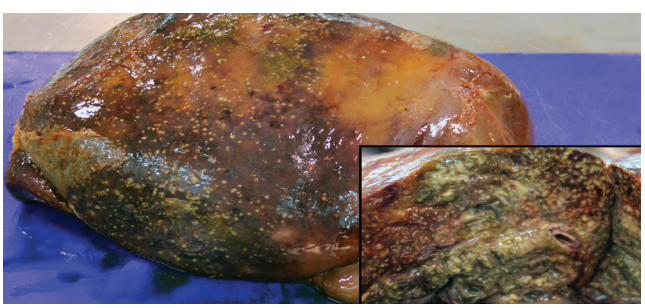

Figure 3: Multifocal pinpoint necrosis throughout the liver surface and parenchyma, (inset) coalescing to larger areas of necrosis on cross section. Photo: Denise Murphy.

Athlone examined a six-day-old calf with a history of having stopped suckling at three days old, and having had to be tube-fed, then developing diarrhoea, which was treated to no avail, and the animal died. The umbilicus was mildly enlarged and there was an area of necrosis/infection on cross section. There was a mild fibrinous peritonitis with fibrin on the surface of the liver. There were scattered multifocal to coalescing pinpoint yellow suppurative/necrotic lesions on both renal cortices and there was a fibrinous pericarditis. There was a fibrinous arthritis bilaterally in the stifle joints and fluid in the small and large intestinal contents. A post-mortem blood sample was haemolysed and unsuitable for zinc sulphate turbidity (ZST) testing. A heavy *Cryptosporidium* oocyst burden was detected in the faeces. *Escherichia coli* was isolated from several tissues. A conclusion of omphalophlebitis/septic polyarthritis (navel ill/joint ill) leading to a septicaemia with a pericarditis, peritonitis and nephritis was reported to the referring veterinarian. A review of calving hygiene and colostrum management was advised.

Figure 4: Fibrinous arthritis in the stifle joint of a calf with omphalophlebitis/septic polyarthritis (navel ill/joint ill) complex. Photo: Denise Murphy.

CARDIOVASCULAR SYSTEM

A five-week-old calf was found dead having shown no clinical signs and submitted to Kilkenny RVL. The heart was found to be very enlarged, with a septal defect. The liver was also much enlarged and there was a nutmeg pattern on the cut surface, suggestive of passive venous congestion (secondary to congestive heart failure). *E. coli* was cultured from multiple organs indicating a bacteraemia. Circulatory failure due to the septal defect was diagnosed.

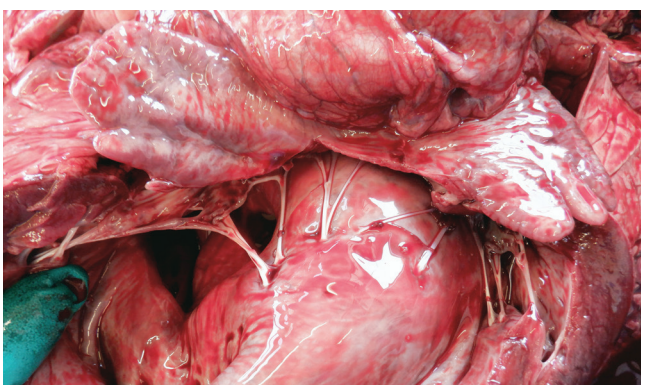

Figure 5: A septal defect in a calf with a history of sudden death. Photo: Aideen Kennedy.

NERVOUS SYSTEM

Septicaemia/meningoencephalitis

Athlone RVL examined a two-month-old calf with a history of anorexia and ill thrift with mild diarrhoea and apparent colic, and being "tender on her feet". It was the 10th similar recent loss. There was mild, subcutaneous oedema around the head and submandibular area. The brain was swollen, soft and oedematous and there was fibrin and haemorrhage on the ventral portion of the hindbrain and around the caudal cerebellum. There was fluid in the sulci of the cerebrum and the gyri were flattened. There was excess clear synovial fluid in the stifles, hock, carpal and elbow joints bilaterally. The small and large intestinal contents and faeces were very liquid, yellow and frothy and the liver was enlarged. *Salmonella enterica* serotype Dublin was isolated from several organs and tissues. Histopathology of the brain showed a severe, diffuse, fibrinosuppurative meningoencephalitis. There were well-scattered paratyphoid nodules in the liver and an interstitial pneumonia pattern in the lungs suggestive of bacteraemia/septicaemia. There were multifocal areas of suppurative tubulointerstitial nephritis in the kidneys. A conclusion of *Salmonella* Dublin septicaemia was reported and advice regarding hygiene, stocking densities and vaccination was given.

Figure 6: Meningoencephalitis in a calf, related to a *Salmonella* Dublin septicaemia. Photo: Denise Murphy.

Dehorning injury

A two-month-old calf was submitted to Kilkenny RVL with a history of neurological signs. Examination of the brain revealed a purulent focus of necrosis on the meninges with congestion extending into the body of the cerebrum. The lesion was directly underneath the site of recent hot iron dehorning. On histopathology, there was a multifocal, suppurative meningoencephalitis with necrotising vasculitis, thrombosis and ischaemic necrosis. It was felt infection had likely spread from the dehorning site. A review of dehorning technique was recommended.

Figure 7: An area of necrosis and purulent infection beneath the site of dehorning. Photo: Aideen Kennedy.

MUSCULOSKELETAL

Blackleg

A three-month-old calf was submitted to Limerick RVL with a history of sudden death. A large volume of black muscle was found in the neck; small black lesions were present in the myocardium. A pooled sample from both sites was positive for *Clostridium chauvoei* using fluorescent antibody technique (FAT).

POISONINGS

The following conditions were reported in September/October 2021. Given similar climatic and production conditions, they could also be important this year.

Nitrate poisoning: it usually occurs particularly during a flush of growth after a dry period. High nitrate levels in forage are present when nitrate is taken up by the plant faster than it can be converted into protein. Accelerated nitrate uptake can occur following dry conditions when plant growth picks up again or is also seen in newly-reseeded pasture. Low soil pH, high nitrogen levels from white clover, low molybdenum and sulphur or phosphorus soil deficiencies also increase nitrate uptake by plants. Using high levels of nitrogen fertilizer late in the season can predispose plants to nitrate accumulation.

Signs of nitrate poisoning in cows can include frothy bloat, staggering, muscle tremors, increased salivation, chocolate- or blue-coloured mucous membranes, recumbency and death.

To lower the risk, avoid putting hungry stock onto risk areas; give safe feed such as hay or silage first. Feed high-risk crops late in the afternoon as sunshine will reduce nitrate levels. Regularly check animals post-introduction to high-risk pastures.

MISCELLANEOUS

SHEEP

Parasitic gastroenteritis and cerebrocortical necrosis were the most common diagnoses from necropsy in sheep in the RVLs

during June 2022.

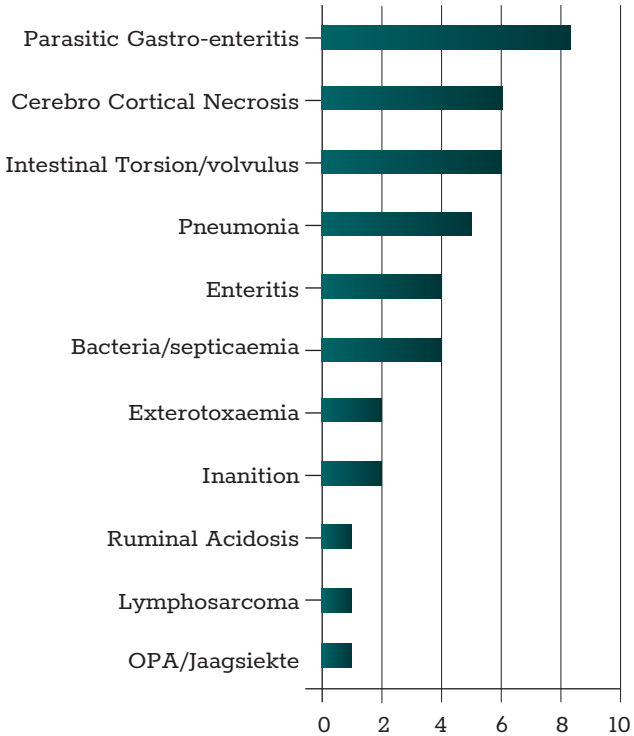

Table 2: The most common diagnoses in sheep submitted for necropsy in June 2022.

GASTROINTESTINAL TRACT

Clostridial enterotoxaemia

A one-month-old lamb with diarrhoea was submitted to Kilkenny RVL. Three deaths had occurred from a group of 600 lambs. On examination, there was a fibrin clot in the pericardial sac. The lungs were congested and oedematous, and there were liquid intestinal contents. *Clostridium perfringens* along with its alpha and epsilon toxins were detected in the intestinal contents, and a review of vaccination protocols was advised with use of a multivalent clostridium vaccine recommended.

Figure 8: A fibrin clot in the pericardial sac of a lamb from which *Clostridium perfringens* along with its alpha and epsilon toxins were found. Photo: Aideen Kennedy.

Intestinal torsion/tapeworm

A six-week-old lamb was found dead and submitted to Kilkenny RVL. On necropsy, the cause of death was found to be a torsion of the small intestine. There was a large tapeworm burden in the intestinal contents; most tapeworm infestations are asymptomatic but, on occasion, heavy burdens may result in unthriftiness, digestive disturbances and diarrhoea.

Figure 9: A heavy tapeworm burden in the intestines of a six-week-old lamb. Photo: Aideen Kennedy.

Haemonchus contortus

Figure 10: Pale mucous membranes indicative of anaemia, in a ewe parasitised by *Haemonchus contortus*. Photo: Maresa Sheehan.

A ewe was presented to Kilkenny RVL for post-mortem examination. It was anaemic with sub-cutaneous submandibular oedema, ('bottle jaw'). The abomasum contained liquid brown contents and myriad worms with a distinctive, spirally-striped 'barber pole' appearance. This animal had a faecal egg count of 16,000 strongyle eggs per gram (EPG). A diagnosis of *Haemonchus contortus* infestation was made, and immediate treatment of cohorts and movement to clean pasture was recommended. The very high egg production/fecundity of these worms mean that they are a key species for development of anthelmintic resistance. Anaemia and weakness are key features of this disease.

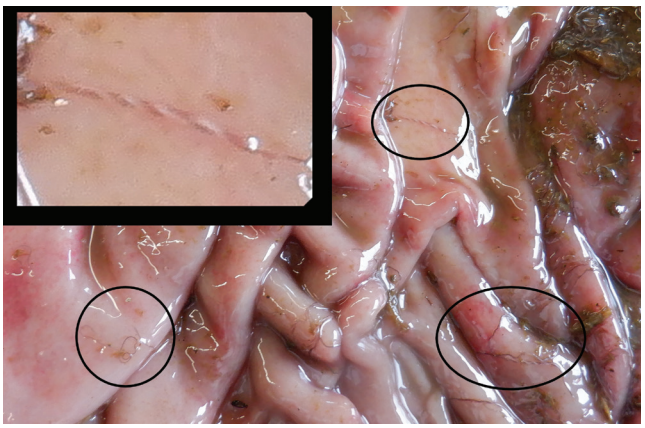

Figure 11: Multiple worms on the abomasal surface of a ewe, with (inset) the distinctive 'barber pole' appearance of *Haemonchus contortus*. Photo: Maresa Sheehan.

CARDIOVASCULAR SYSTEM

Athlone RVL examined a four-year-old ram with a history of having been found dead unexpectedly. The pericardial sac was markedly distended and contained a large volume of fluid and large gelatinous fibrinous clots, and there was a severe, diffuse, fibrinous pericarditis. There was a necrotic lesion in the myocardium at the base of the heart and the lungs were congested. The liver was enlarged, and the forestomachs and GIT were unremarkable. A conclusion of death due to severe fibrinous pericarditis was reached and a foreign body, e.g., a wire or needle was suspected, but was not found.

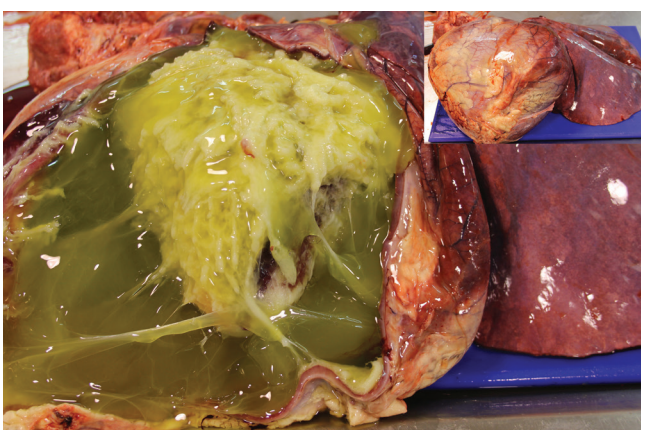

Figure 12: Severe, diffuse pericarditis in a ram with a history of sudden death. Photo: Denise Murphy.

MISCELLANEOUS

Orf

A one-year-old ewe was submitted to Kilkenny RVL, the ewe was being treated for a skin condition. On examination, there was severe, bilateral dermatitis/ulceration extending from the orbital region to the muzzle. There were focal areas of skin sloughing. The intestinal content was very liquid. The liver was in an advanced state of autolysis impairing examination, however there were adult liver fluke in the gall bladder. McMaster results revealed an egg count of 3,400EPG. On histopathology there was a subacute, marked-to-severe, ulcerative neutrophilic dermatitis. *Staphylococcus aureus* was cultured from the skin and Ovine parapox PCR testing returned a positive result. Contagious ecthyma (orf) is caused by a pox virus (genus Parapoxvirus) which can remain infective in dried scabs on pasture for many months. Orf is a zoonosis. Contagious pustular dermatitis and *S. aureus* may act synergistically to cause severe facial dermatitis which appears as sharply demarcated areas.

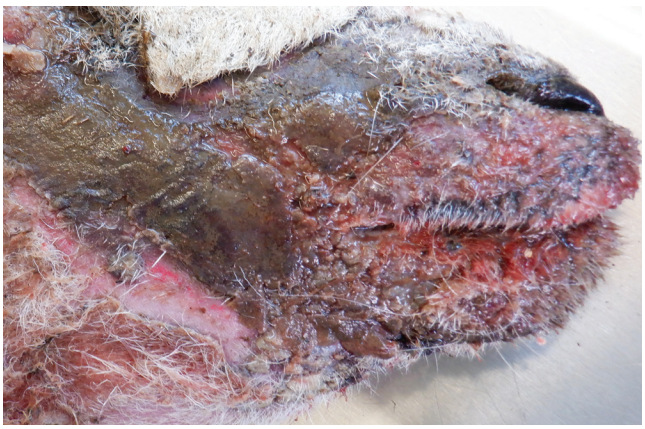

Figure 13: Severe dermatitis in a sheep from which *Staphylococcus aureus* and ovine parapoxvirus were identified. Photo: Aideen Kennedy.

Lymphoma

A four-year-old ewe was presented to Kilkenny RVL for post-mortem examination. Multiple superficial and visceral lymph nodes were enlarged and pale. On cross section, the spleen contained multiple pale small nodules. The mammary gland was firm on palpation. There were discreet areas of consolidation of the lungs and adhesions between the lungs and thorax; there were fibrin clots in the thorax. On histopathological examination of the organs and lymph nodes, densely cellular neoplasms composed of sheets of round cells were seen. Neoplastic cells had indistinct cell borders and scant eosinophilic granular cytoplasm. Nuclei were round to ovoid, with coarsely-stippled chromatin and between one and four distinct nucleoli. The mitotic count was up to three per high-power field (HPF). The changes seen were consistent with lymphoma. Multicentric lymphoma in sheep can be idiopathic or associated with bovine leukosis virus. This virus was not detected in this sheep.

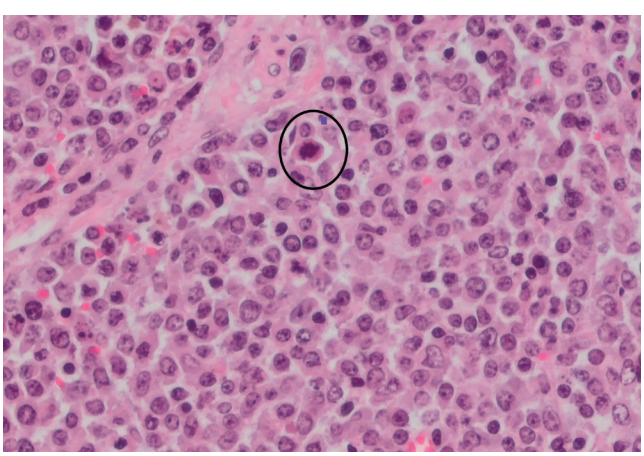

Figure 14: A multicentric lymphoma found in a ewe, with a mitotic figure (circled). Photo: Maresa Sheehan.