Regional Veterinary Laboratories Report

May 2020

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 429 carcases and 17 foetuses during May 2020. Additionally, 1,632 diagnostic samples were tested to assist private veterinary practitioners (PVPs) 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 May 2019.
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

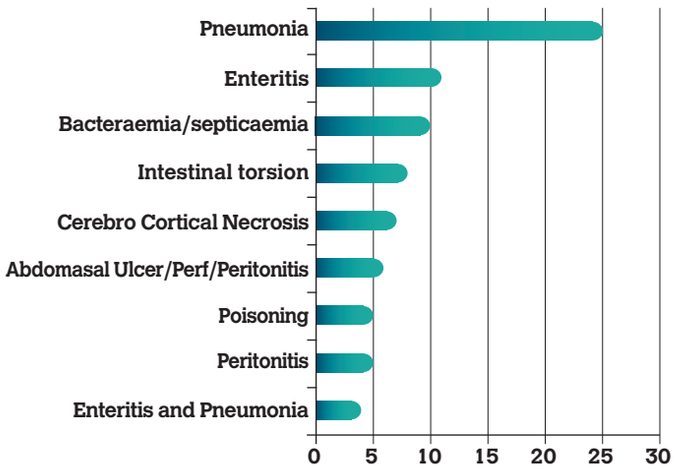

Table 1: The most common diagnoses in bovine carcase submissions (excluding foetuses) to DAFM RVLs.

GASTROINTESTINAL TRACT

Abomasal ulceration

An adult cow, which had been found dead, was submitted to the Kilkenny RVL for post-mortem examination. The animal had pale mucous membranes and a large bleeding abomasal ulcer. In addition, a wire was found penetrating the wall of the reticulum. There was a chronic inflammatory response associated with the wire. The cause of death was determined to be the haemorrhage resulting from the abomasal ulcer. However, a review of feeding practices was recommended to mitigate against the inclusion of hardware in feed.

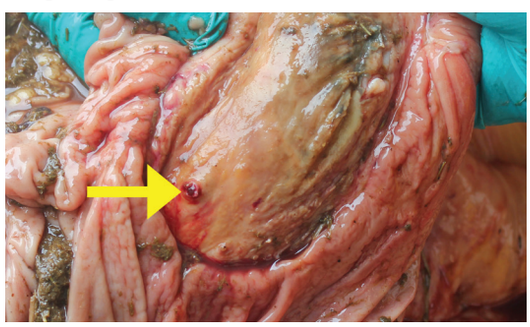

Figure 1: Focally extensive abomasal ulcer with an associated bleeding vessel. Photo: Maresa Sheehan.

RUMINAL ACIDOSIS

A 12-week-old calf with a history of sudden death was submitted to Kilkenny RVL. On post-mortem examination there was an intestinal torsion. The intestinal content appeared haemorrhagic and ruminal contents presented with a distinctive acidic smell and porridge-like contents. There was undigested grain in the reticulum. The ruminal pH was at 5.1. A ruminal post-mortem pH below 5.5 is considered as indicative for ruminal acidosis. Volvulus with concurrent ruminal acidosis was diagnosed as a cause of death. If there is a causative relationship between ruminal acidosis and volvulus, it remains unclear. A review of diet and feeding management was advised for remaining calves.

VOLVOLUS

A three-month-old calf found dead was delivered to Sligo RVL for necropsy. The abdomen appeared very bloated and an intestinal torsion was revealed upon opening the carcase. A cause for the torsion could not be identified.

Figure 2: Mesenteric torsion in a three-month-old calf. Photo: Shane McGettrick.

LIVER ABSCESSATION

A four-month-old calf with a history of pneumonia was submitted to Kilkenny RVL. On post-mortem examination, the liver presented with diffuse abscessation. There were extensive adhesions between the liver and diaphragm. The lungs were congested. *Trueperella pyogenes* was isolated from the lung and liver. Histopathological examination of the liver revealed extensive fibrosis and bile duct proliferation, which was considered to be a consequence of the abscesses. The cause of the abscessation was most likely a previous bacteraemia.

Figure 3: Multifocal abscessation in the liver of a calf. Photo: John Fagan.

RESPIRATORY TRACT

Bronchopneumonia

Kilkenny RVL received the carcase of a four-week-old calf, that had stopped drinking and died despite treatment efforts. On post-mortem examination there was fibrinous peritonitis. The mucosal surface of the abomasum presented with multifocal ulcers. The lungs were consolidated cranioventrally. There was fibrinous pleuritis and there were adhesions between lobes and to the thoracic wall. There was also fibrin on the pericardium. On histology of the lungs there was severe acute diffuse fibrino-suppurative pleuritis with necrosis and vasculitis. Additionally, there was a moderate to severe sub-acute fibrino-suppurrative bronchopneumonia and mild interstitial pneumonia. No aetiological agent was identified on laboratory tests. The interstitial pattern seen may be associated with a bacteraemia/septicaemia. The most common pathogens causing bronchopneumonia include *Pasteurella* spp. and *Haemophilus somnus*.

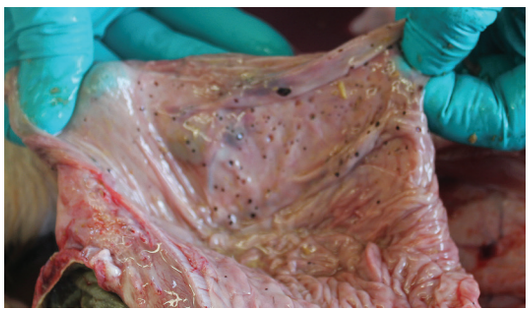

Figure 4: Multifocal abomasal ulceration. Photo: Aideen Kennedy.

Figure 5: Chronic pleuritis. Photo: Aideen Kennedy.

CARDIOVASCULAR SYSTEM

A 10-month-old weanling was submitted to Kilkenny RVL with a history of respiratory disease that was unresponsive to treatment. There was a severe chronic suppurative valvular vegetative endocarditis with associated pulmonary haemorrhage due to emboli detaching and lodging in pulmonary vasculature.

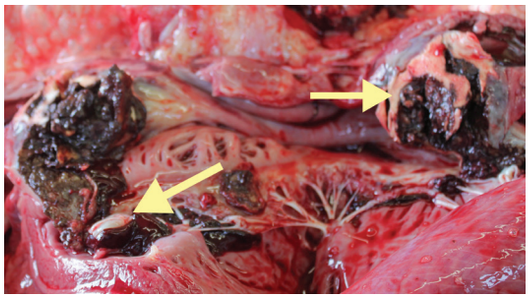

Figure 6: Vegetative endocarditis in a weanling. Photo: Maresa Sheehan.

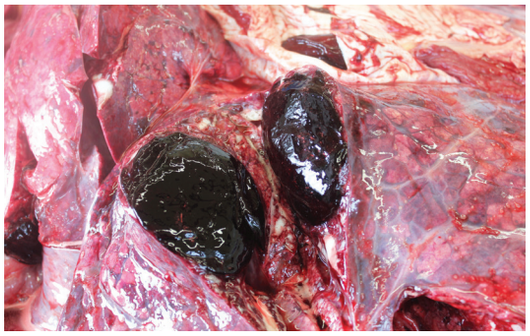

Figure 7: Pulmonary haemorrhage associated with embolism from vegetative endocarditis. Photo: Maresa Sheehan.

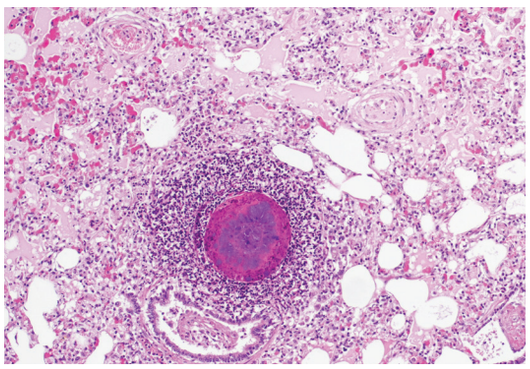

Figure 8: Septic embolism arising from vegetative endocarditis. Photo: Maresa Sheehan.

NERVOUS SYSTEM

Listeriosis

A 10-year-old cow was submitted to Athlone RVL with a history of nervous clinical signs for four to five days. It was the only animal in the group showing clinical signs. Gross post-mortem examination and ancillary testing were unremarkable. Histopathology of the brain revealed marked perivascular lymphocytic cuffing and multifocal areas of microabscessation in sections of spinal cord, hind brain and, to a lesser extent, in the midbrain. These findings are consistent with a diagnosis of listerial encephalitis.

MENINGOENCEPHALITIS

Sligo RVL received a 4.5-month-old calf that had developed nervous clinical signs with swaying, a drooping head, tail limpness and lameness of one back leg. The animal improved initially on treatment but relapsed and had to be euthanised. On post-mortem examination, there was mild ulceration of the abomasum, but no other visible lesions. Histopathology of the brain revealed subacute, chronic meningoencephalitis. *Staphylococcus* sp. was cultured from brain tissue. Bacterial meningoencephalitis was diagnosed as cause of death.

MUSCULOSKELETAL

Clostridial disease

An eight-week-old calf, which had been found dead, was examined in Athlone RVL. There was diffuse subcutaneous crepitus and dark haemorrhagic dry lesions in the muscles of the left hindquarter. There was a diffuse fibrinous pericarditis and haemorrhagic cardio myositis. The lungs were very congested, and the liver was autolysed. *Clostridium septicum* was detected in affected muscle by fluorescent antibody test (FAT). A diagnosis of clostridial myositis was made and advice regarding vaccination of cohort animals with a multivalent clostridial vaccine was given.

POISONING

Lead

Athlone RVL diagnosed several cases of lead poisoning in May. One was a case in a three-to four-week-old calf that had been found dead. It was the second similar loss and both animals had broken into a field. On necropsy, there was marked pulmonary congestion and petechial haemorrhages on both renal cortices and the thymus. The renal cortex lead concentration was 510μmol/kg. A value >120μmol/kg is a sufficient basis for diagnosis of lead toxicity. Due to the potential impact on the food chain, the potential source as well as other animals which were suspected to have been exposed had to be identified. All potentially exposed animals need to be tested to ensure no lead could enter the food chain via milk or meat.

MISCELLANEOUS

Babesiosis

A two-year-old cow found dead without prior evidence of illness was delivered for post-mortem examination to Sligo RVL. The carcase appeared jaundiced and the spleen was enlarged. The urine was dark red. There were multifocal haemorrhages present on the liver. *Babesia* sp. was detected by polymerase chain reaction (PCR) technique. Babesiosis also known as Red Water was diagnosed as cause of death.

Trauma

A 14-month-old heifer with a history of frothing, panting, coughing and apparent pain for two weeks before euthanasia, was submitted to Sligo RVL. On post-mortem examination there was locally extensive caudodorsal necrotic glossitis with surrounding pharyngeal cellulitis. The lesion was foul-smelling upon incision. *Streptococcus uberis* was isolated from the lesions. Trauma such as that caused by a dosing-gun injury is a common cause of these findings. The significance of the isolated *streptococcus* species is unclear.

SHEEP

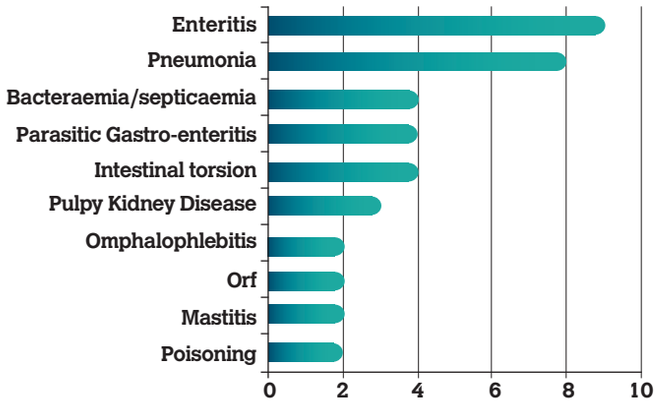

Table 2: The most common diagnoses in ovine carcases (excluding foetuses) submitted to the DAFM in May 2020.

RESPIRATORY TRACT

Pneumonia

A six-week-old lamb was submitted to Athlone RVL with a history of sudden death, the fourth similar loss. There was a severe bilateral anteroventral fibrinous pleurisy and pneumonia. The liver was congested and enlarged. *Mannheimia haemolytica* was isolated from the lung by bacterial culture and detected by PCR. Ancillary testing for underlying conditions like tick-borne fever (TBF) was unrewarding. A severe coccidial burden was detected in the faeces, which may have contributed to the lamb's death. A diagnosis of acute pneumonia caused by *M. haemolytica* was made. Two one-month-old lambs with a history of sudden death were submitted to Sligo RVL. On necropsy, there was severe dehydration and extensive necrohaemorrhagic pneumonia. M. haemolytica was isolated from the lesion.

URINARY/REPRODUCTIVE TRACT

Mastitis

Sligo RVL received a two-year-old ewe with a history of sudden death. On post-mortem examination there was a severe gangrenous mastitis. *M. haemolytica* was isolated from the lesion. Septicaemia was diagnosed to be the most likely cause of death.

Pyelonephritis

A three-month-old lamb was submitted to Sligo RVL for a post-mortem examination, which revealed thoracic and pulmonary oedema. Both kidneys appeared enlarged and contained large amounts of purulent material compressing the medulla and distending the renal pelvis and ureters. There was severe, diffuse, necrotising cystitis, omphalophlebitis and urachitis. The most likely cause of death in this animal was pulmonary oedema due to acute renal failure. The renal failure presented acutely, however this was due to exhaustion of renal reserve function in an end-stage kidney. This animal had a chronic bacterial infection that is likely to have originated in

the umbilicus and tracked to the lamb's kidneys over time via the urachus.

Figure 9: Pyelonephritis in a two-month-old lamb. Kidney cut in longitudinal section to demonstrate purulent material in pelvic region and compression of renal parenchyma. Pyelonephritis developed subsequent to a chronic omphalophlebitis and urachitis. Photo: Shane McGettrick.

NERVOUS SYSTEM

Louping ill

A one-year-old hogget was submitted to Kilkenny RVL. Six cases of sudden death from this hill-grazing flock of 92 were recorded in a week. On gross post-mortem examination, there was generalised mild to moderate lymphadenopathy. In addition, there was one small liver lesion. PCR testing for *Anaplasma phagocytophilum* (tick-borne fever) was positive. *Bibertsteinia trehalosi* was isolated from liver tissue. Histology of the brain revealed multifocal areas of gliosis affecting mainly the grey matter of the spinal cord, medulla and mid-brain. There was marked perivascular cuffing and discreet examples of neuronophagia and neuronal degeneration. The lesions were highly suggestive of louping ill. Louping ill is a further tick-borne disease and has zoonotic potential.

POISONINGS

Sligo RVL received a two-month-old lamb, which had been found recumbent and kicking before death. On necropsy, there was severe generalised jaundice and the urine was dark orange in colour. Liver and spleen appeared enlarged. The blood appeared to be watery and clotting poorly.
On histopathology, there was a severe acute periacinar necrotising hepatopathy. Acute liver failure and haemolytic anaemia was diagnosed as the cause of death. The aetiology remained unclear. The histology pattern was consistent with acute liver necrosis which may be associated with poisoning. Potential hepatotoxins include a variety of chemicals and some poisonous plants.

MISCELLANEOUS

Orf/Contagious echthyma

Sligo RVL received two neonatal lambs which had developed skin and hoof lesions as well as lameness shortly after birth. The farm had reported 12 similar losses out of a group of 100 lambs. On post-mortem examination there was multifocal skin lesions characterised by hoof sloughing, red raw alopecic limb lesions and peri-oral crustations. DNA specific to parapoxvirus was identified in the lesions. Cause of death was, most likely, a secondary bacterial infection leading to sepsis.

Orf, or contagious echthyma, is caused by a parapoxvirus and commonly affects young sheep and goats.
Parapoxvirus is spread worldwide. It causes a localised infectious dermatitis and mainly affects the lips, but lesions also occur around the face, the coronary band and, in rare cases, on the udder of lactating ewes nursing affected lambs. The primary lesions usually start at the mucocutaneus junction of the lips as papules developing through vesicular and pustular stages and finally encrust. Lesions can coalesce and form large scabs with underlying verrucose masses of the dermal tissue. The course of the disease may last one to four weeks. Severely affected lambs can present with lameness and weight loss. A common complication is the development of secondary infections leading to necrobacillosis or infections with *Dermatophilus congolensis* causing 'strawberry footrot.'
While the lesions are quite characteristic, ulcerative dermatosis of sheep, blue tongue and foot and mouth disease need to be considered as differential diagnosis especially in cases with high morbidity and salivation, fever and lameness. PCR tests are available to diagnose parapox virus infections. Treatment is mainly aimed at the prevention of secondary infections.
It is important to note that this condition is a zoonosis and the virus is transmissible to humans where the lesions usually occur on hands and face, but tend to be more proliferative than in sheep and goats. Reasonable protective measures like the wearing of gloves are recommended when handling affected animals.
Animals tend to develop a good immunity after an infection. A live vaccine is available in Ireland, but should not be used on farms on which orf is not a problem.

OSTEOMALACIA

A one-year-old hogget, which had been found with one broken leg and seemed to have broken a further leg shortly after was submitted to Sligo RVL after euthanasia. Post-mortem examination confirmed a fractured left tibia and a spirally fractured right humerus with large amounts of haemorrhage in the surrounding soft tissue. There were multiple healed fractures on the ribs with callus formation. The rib bones appeared rubbery, brittle and they broke easily. The cortical bone in the long bones appeared thinner than normal. There were no other signs of trauma.
The fractures present in this animal were considered spontaneous based on the absence of damage to surrounding tissue consistent with trauma usually required to cause a bone fracture in a sheep. However, this does not preclude that trauma occurred but indicates that the bone fractured more easily. Rib lesions indicate previous similar injuries.

A likely diagnosis was considered to be osteomalacia which may occur in grown animals when bones become demineralised. Osteomalacia is associated with nutritional imbalance, particularly calcium to phosphorus ratios, chronic parasitism, copper deficiency, vitamin D deficiency and other causes. Identification of the initiating factor may be difficult as imbalance may have been present some time in past. It was pointed out that findings in a single animal may not represent the flock and findings may have been unique to this animal. A flock-based investigative approach was advised to rule out parasitism particularly a previous period where there were heavy intestinal burdens, copper deficiency and nutritional imbalances in other sheep, particularly in this animal's cohort. It was also advised to check young sheep in the flock for bone abnormalities as there may be clinical signs in sheep such as lameness or angular limb deformities where disease occurs before growth plate closure. Copper deficiency in sheep may be difficult to diagnose as assays represent current levels and will be affected by current diet and liver storage capacity and may not reflect a previous deficiency

TRAUMA

Sligo RVL received a three-month-old lamb, which had not been thriving and showed clinical signs suggestive of mild pneumonia. There were several more lambs in the group affected. On post-mortem examination there was cranio-ventral pneumonia affecting approximately 60% of the lung tissue. There was an abscess containing compacted ingesta and a bolus in proximal neck associated with a tear in proximal oesophagus. The cause of death in this lamb was severe bacterial pneumonia. The predisposing cause was a dosing-gun injury.

Figure 10: Dosing-gun injury in a three-month-old lamb, showing a mineral bolus and ingesta present in the neck muscle distal to the pharynx and lateral to the proximal trachea. The lambs had been given a bolus two weeks prior to death. Photo: Shane McGettrick.