

Regional Veterinary Laboratories Report

August 2020

Regional veterinary laboratories (RVLs) carried out post-mortem examinations on 310 carcasses and 36 fetuses during August 2020. Additionally, 1,265 diagnostic samples were tested to assist private veterinary practitioners (PVPs) with the diagnosis and control of disease in food-producing animals. The following report presents a selection of findings from carcass submissions to Department of Agriculture, Food and the Marine (DAFM) RVLs situated in Athlone, Cork, Kilkenny, Limerick, Sligo and Dublin during August 2020.

The objective of this report is to provide feedback to the veterinary practitioner on disease patterns at this time of the year. Hence, both common and unusual clinical presentations are described together with the results of the various investigations and tests to further assist diagnosis, encourage thorough investigation of clinical cases, and to provide context for practitioners when interpreting laboratory reports.

CATTLE

Pneumonia and enteritis were the most common causes of death in bovine carcasses submitted to the RVLs in August 2020.

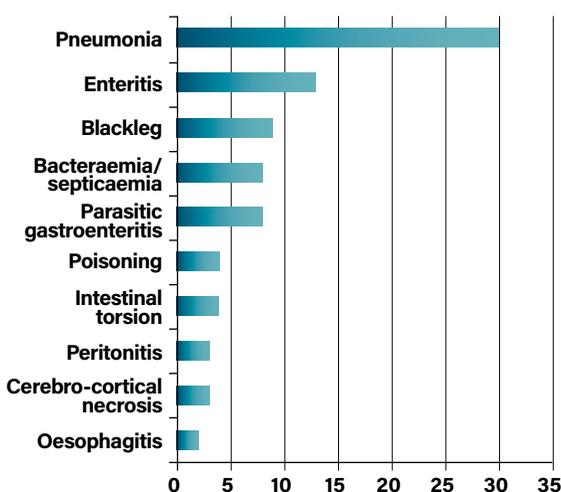


Table 1: The 10 most common causes of death diagnosed in bovine carcasses submitted to DAFM RVLs in August 2020.

GASTROINTESTINAL TRACT

Summer scour syndrome

A five-month-old dairy calf was submitted to Kilkenny RVL with a history of diarrhoea, ill thrift and failure to thrive. The calf had been re-housed for treatment, which included anthelmintics, antimicrobials and nonsteroidal anti-inflammatory drugs (NSAIDs). On post-mortem examination, there was severe dehydration and faecal staining on the hind quarters. There was a moderate to severe oesophagitis in the lower third of the oesophagus. There was mild oedema in the interstitium and congestion in the lungs. The intestinal content was liquid and green in colour. Mesenteric lymph nodes were swollen. On histopathology, there was a necrotising ulcerative oesophagitis. In the intestine, there was crypt abscessation and mononuclear cell infiltration into the mucosa and large numbers of eosinophils, lymphocytes, neutrophils, and oedema in the submucosa. Common pathogens could not be detected. Given the erosive lesions, a diagnosis of summer scour syndrome (SSS) couldn't be excluded. Continued submission of

samples from cohorts showing signs of diarrhoea was recommended to rule out infectious causes.

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. Aetiology is currently unclear. There have been increased 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 however further research is ongoing. Grazing of lush grass is a common finding.

Parasitic gastroenteritis

An eight-month-old calf was presented to Limerick RVL with a history of sudden death. Necropsy revealed very poor nutritional condition with all internal fat depots being depleted. Examination of the intestines revealed an enteritis with concomitant external evidence of perineal soiling. The abomasal mucosa appeared congested and haemorrhagic. McMaster's technique revealed a notable parasitic burden of 1,000 egg/gram of faeces, confirming a diagnosis of parasitic gastroenteritis (PGE).

RESPIRATORY TRACT

Pneumonia

Sligo RVL examined two seven-month-old calves that had been found dead. On post-mortem examination extensive dematophytosis (ringworm) was noted on head and neck. The lung was consolidated with approximately 50% of the parenchyma involved and there were multifocal purulent and necrotic areas. *Pasteurella multocida*, *Histophilus somni* and *Mycoplasma bovis* were detected in lung tissue by polymerase chain reaction (PCR). Viral involvement in the pneumonia could not be ruled out.

Parasitic bronchitis

A five-month-old calf was submitted to Limerick RVL with a history of sudden death. Necropsy disclosed a very high number of lungworms in the trachea. Cranio-ventrally distributed lung consolidation and pneumonia were observed

with 'ground glass' emphysema. Histopathology disclosed lungworm larvae, broncho-interstitial pneumonia and emphysema. A diagnosis of parasitic pneumonia was made. Athlone RVL diagnosed a number of cases of parasitic bronchitis and pneumonia this late summer and autumn. A 13-month-old bull was examined with a history of coughing, pyrexia and nasal discharge two weeks prior to death. Treatment efforts did not succeed. On necropsy, there was severe bilateral subpleural and interlobular emphysema with emphysematous bullae present in the caudo-dorsal lung lobes. Lungworm larvae were seen in the airways. Bovine herpesvirus 4 (BHV-4) and *Mycoplasma bovis* were detected in lungs by PCR. Histopathology of lungs showed diffuse alveolar damage with hyaline membrane formation and type 2 epithelisation and multifocal areas of suppurative bronchopneumonia. There was no histological evidence of *Mycoplasma bovis* involvement in sections examined. A diagnosis of parasitic pneumonia was made.

NERVOUS SYSTEM

Hepatic encephalopathy

Sligo RVL diagnosed hepatic encephalopathy in a 2.5-year-old cow. The animal had presented clinically with increased respiratory rate, diarrhoea, head pressing and a jugular pulse. On necropsy, the liver was hardened and fibrosed. There was diffuse, severe abomasal fold oedema with diffuse ulceration and watery intestinal contents. The kidneys were unremarkable. Laboratory diagnostics revealed very high urea levels in vitreous humour. On histopathology, the liver presented with extensive dissecting fibrosis and biliary hyperplasia and multifocal areas of necrosis. The most likely cause of this chronic hepatopathy is an earlier toxic insult. Histopathology of the brain revealed multifocal marked vacuolation of the white matter at the interface of grey and white matter consistent with metabolic encephalopathy. While the exact cause of the toxic injury could not be identified it is known that pyrrolizidine alkaloids (ragwort *Senecio jacobea* poisoning) can cause this pattern in ruminants.

Clostridial disease

Clostridial diseases are common fatal diseases in livestock. Multivalent clostridial vaccines are available, very effective and affordable, and highly recommended. It is noteworthy however, that the basic immunisation and boosters, as instructed by the manufacturer, must be observed to achieve adequate protection.

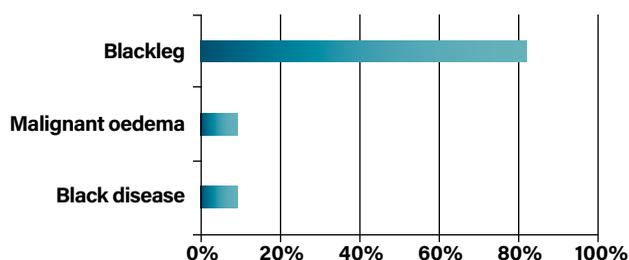


Table 2: Clostridial diseases as causes of death in bovine carcasses (excluding foetuses) submitted to DAFM RVLs in August 2020.

Athlone RVL examined a three-month-old calf with a history of having been found dead with no prior sickness. It had been the third similar loss in 24 hours. On necropsy, there were dry emphysematous haemorrhagic necrotic lesions in the muscles around the left hip, the diaphragm, the left intercostal muscles and left masseter muscle. There were multifocal haemorrhages in the myocardium and excess bloody fluid in the thoracic cavity. *Clostridium chauvoei* was detected by fluorescent antibody tests (FAT) on smears of the muscle lesions. A diagnosis of clostridial myositis/blackleg was made and advice regarding the vaccination of cohorts with a multivalent clostridial vaccine was given.

Black disease

A four-month-old calf was submitted to Kilkenny RVL with a history of pneumonia and poor response to treatment. On post-mortem examination, there was a fibrinous bronchopneumonia with approximately 60% of lung consolidated cranially and multifocal consolidated areas in the caudal areas. The liver had multifocal lesions with a red rim and pale necrotic centre. The kidneys were both pale with multifocal pale foci. *Clostridium novyi* was detected by FAT in the liver.

On histopathology, there were changes consistent with a systemic fungal infection in multiple organs. Infectious necrotising hepatitis or 'black disease' was diagnosed as eventual cause of death with an underlying systemic mycosis, likely related to repeated antibiotic treatment.



Figure 1: Characteristic hepatic lesion in a case of black disease. Photo: Aideen Kennedy.

POISONINGS/MISCELLANEOUS

Abscessation

Sligo RVL examined a 3.5-year-old cow which had been failing for the previous three months. The farmer described recurrent oedema in the neck which improved partially with treatment. Two weeks prior to death the cow presented with progressive hind leg weakness and, finally, recumbency. The animal had to be euthanised for welfare reasons. On post-mortem examination, an approximately 10cm-sized abscess involving lymph nodes and surrounding tissue was discovered in the thoracic inlet. The lesion was space-occupying compressing the oesophagus, trachea and adjoining vessels. The degree of fibrosis indicated a chronic lesion that has enlarged gradually over some time. The

symptoms described in the history can be attributed to the abscess as it was a chronic source of infection and would have compressed the adjacent vessels, compromising cardiac function and preventing the passage of food through the oesophagus. The initial cause of the abscess could not be identified but may have arisen from a penetrating trauma in the area or an infection tracking, via lymph drainage or fascial planes, most likely from the head or front foot.

A four-month-old calf was submitted to Limerick RVL with an initial history of respiratory symptoms, the animal then developed symptoms of ruminal bloat before death. Necropsy disclosed several large pulmonary abscesses in the cranial right lung; lung tissue surrounding the abscesses was consolidated. Multiple large abscess and fibrous tissue scarring were found in the liver. Two abscesses were found adjacent to the distal oesophagus; it is considered that physical pressure from these may have interfered with the release of rumen gases. The initial cause of the multifocal abscessation could not be determined.

Poisoning

Athlone RVL has seen a number of cases of chronic copper poisoning in both cattle and sheep in the month of August. One such case was a three-month-old calf that had been seen by the PVP and treated for suspected liver disease. On necropsy, there was marked icterus of the carcass and conjunctivae. The liver was jaundiced, the kidneys were very dark, and the urine was dark red. Liver and kidney copper levels were both well above the normal range and indicative of toxicity. A diagnosis of an acute haemolytic crisis secondary to copper poisoning was made. Farmers are advised to check the copper levels in concentrates and avoid over-supplementation of copper in the diet.

Copper poisoning

Chronic copper toxicity in cattle usually occurs following a long process of accumulation of copper in the liver over a period of weeks or even months but it usually presents as an acute disease. The clinical signs are caused by the sudden release of a large amount of copper from the liver which leads to intravascular haemolysis and an acute haemolytic crisis. This leads to anaemia, haemoglobinuria, jaundice, colic, diarrhoea and depression. Generally, affected animals will be depressed, anorexic and weak and may become recumbent before dying. The diagnosis can be made in the live animal where there is increased liver enzyme activity (AST, GLDH, GGT), elevated serum copper concentrations in blood, anaemia and haemoglobinuria. Over-supplementation of copper is the main cause of copper toxicity. In many cases, toxicity has occurred in herds that farmers did not know they were feeding high concentrations of copper. This is usually because the cattle were being supplemented with copper via a variety of different routes – mineral, in-feed, injection or bolus without collating them. The copper status of a group of animals should always be checked before initiating supplementation and see if it is required. The measurement of liver copper concentration in cull cows or by liver biopsy is the optimal metric. Serum copper concentrations are not as good at determining the need for supplementation, but they will confirm that toxicity is unlikely.

Plant poisoning

Calves were submitted to Kilkenny RVL from a herd that had experienced a large number of losses over a three-day period. Laurel leaves (*Prunus spp.*) were found in the abomasum of the second carcass submitted for post-mortem examination. The herd history and a farm investigation identified laurel hedging in the paddock where the calves were grazing just prior to the onset of deaths. Cyanide toxicity was confirmed on blood samples from cohort animals.



Figure 2: Laurel leaves recovered from a rumen of a calf in a case of cherry laurel poisoning. Photo: Maresa Sheehan.

Cherry laurel (*Prunus laurocerasus*) is commonly used in evergreen hedges, but other laurel species, eg. Portuguese laurel, are increasingly popular. Laurel species contain cyanogenic glycosides which are highly toxic for livestock, but also for dogs and humans.

Most commonly, livestock are exposed to these plants is the disposal of hedge clippings into the field. In most cases, this does not occur maliciously, but it is important to highlight the dangers of this practice to the health of livestock.

Plant poisoning occurs commonly due to hedge clippings, but ruminal acidosis, parasitic disease like neosporosis or toxoplasmosis, or inadvertent chemical exposure as pesticides or fertilizers are further dangers from feeding cut or mowed grass and hedge cuttings.

Lymphoma

Kilkenny RVL received a submission of a three-month-old calf that had presented with diarrhoea and had been unresponsive to treatment; two similarly presenting calves in the herd had responded to antimicrobial therapy. The submitted calf was severely dehydrated. There was a generalised lymphadenopathy – all lymph nodes were enlarged. The liver was very enlarged and pale in colour. Both kidneys appeared enlarged with multifocal white foci in the cortex. The lungs were congested and oedematous. Histopathology showed multiple organs with an unencapsulated infiltrative neoplasm comprising sheets of round cells consistent with lymphocytic cells. Lymphoma was diagnosed. Tests for enzootic bovine leukosis were negative.



Figure 3: Enlarged liver in a calf with lymphoma. Photo: Aideen Kennedy.

SHEEP

Pneumonia and parasitic gastroenteritis were the most commonly recorded causes of death in sheep carcasses submitted to the regional veterinary laboratories in August 2020.

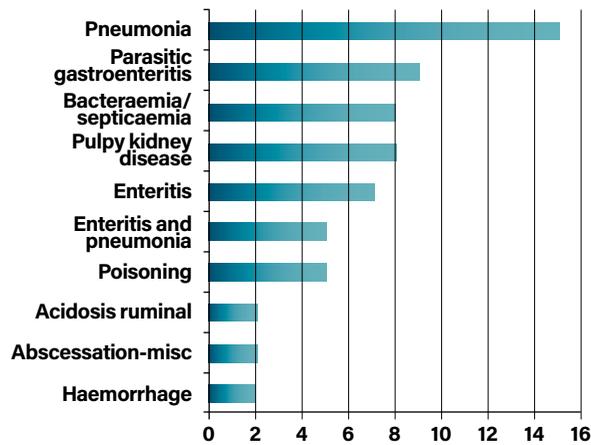


Table 3: The 10 most common causes of death in sheep carcasses submitted to DAFM RVLs.

GASTROINTESTINAL TRACT

Ruminal acidosis

Sligo RVL received a three-year-old ram which had been noticed as 'failing' for approximately 10 days. On post-mortem examination, there was diffuse rumenitis and a very low ruminal pH (<5), which is highly indicative of ruminal acidosis. There was concurrent parasitic gastroenteritis. The ruminal acidosis was the most significant finding.

RESPIRATORY TRACT

Pneumonia

A three-year-old ram with recurring signs of pneumonia and a cough was delivered to Sligo RVL for investigation. On post-mortem examination, there was severe chronic pleurisy

and bilateral purulent pneumonia. *Bibersteinia trehalosi* and *Trueperella pyogenes* were detected in the lung tissue.



Figure 4: Diffuse, severe, chronic pleuropneumonia in a ram. Photo: Rebecca Froehlich-Kelly.

A five-year-old ewe was submitted to Kilkenny RVL with a history of being off form for approximately one month. Post-mortem examination revealed approximately 60% of the right lung lobes consolidated and 30% of the left. There were suspect foci of necrosis within the consolidated region. The bronchial lymph nodes were enlarged. The liver presented white foci suspected to be old parasitic lesions. *Histophilus somni* and *Mycoplasma ovipneumonia* were identified in lung tissue. On histology, there was a severe extensive fibrosis and suspected smooth muscle hyperplasia, bronchiolitis obliterans, BAL hyperplasia and type II pneumocyte hyperplasia, and multifocal discrete suppurative foci. The changes were suggestive of a chronic severe pneumonia.



Figure 5: Chronic severe pneumonia in a ewe. Photo: Aideen Kennedy.

URINARY/REPRODUCTIVE TRACT

Hydronephrosis

Athlone RVL examined a three-year-old ram with a history of ill-thrift all year. He had been found dull and was treated by the veterinary surgeon for pneumonia. On

I REGIONAL VETERINARY LABORATORIES REPORT

gross post-mortem examination, the kidneys appeared pale, enlarged and fluid-filled with a very thin wall; there was hydronephrosis. The urinary bladder was dilated with urine. An obstruction in the urethra was no longer present at post-mortem but this is a frequent finding in cases of urethral obstruction in rams. Urea levels in vitreous humour were very high and suggestive of uraemia and significant renal disease. Histopathology of the kidneys showed marked cortical and medullary fibrosis of remaining tissue indicating a chronic course. A diagnosis of hydronephrosis secondary to ongoing urethral obstruction was made and advice was given to review the concentrate and mineral components of the diet.

NERVOUS SYSTEM

Pulpy kidney

Athlone RVL examined a two-month-old lamb with a history of being recumbent and opisthotonos. The lamb died before he could be treated. It was the third loss in less than two weeks. On necropsy, there were no visible lesions. Intestinal contents appeared soft. Ancillary laboratory tests were unrewarding. Histopathology of the brain showed proteinaceous perivascular oedema in the brain (microangiopathy/serum lakes). This is pathognomonic for pulpy kidney disease even when epsilon toxins are not detected. A diagnosis of *Clostridium perfringens* type D enterotoxaemia/pulpy kidney disease was made, and advice was given regarding vaccination with a multivalent clostridial vaccine.

Contagious ecthyma/Orf

A two-month-old lamb was submitted to Sligo RVL with a history of not thriving, swelling of the face and lips, with subsequent development of crusty proliferative lesions around mouth and not sucking. On post-mortem examination, there was proliferative dermatitis around the muzzle. Orf virus was detected in the lesions. There was concurrent parasitic gastroenteritis and coccidiosis. Some *Haemonchus contortus* eggs were present in the intestinal contents but no adults were observed grossly. The PVP and the farmer were reminded of the zoonotic potential of the disease.

OTHER SPECIES

Pigs

Backweston veterinary post-mortem lab investigated a case of a second-stage weaner pig, which presented with a history of acute onset shaking and death. On gross post-mortem examination, there were severe lesions of vegetative valvular endocarditis present on the right atrioventricular valve and the aortic valves along with a marked fibrinous pericarditis. There was mottled cranioventral lung congestion and a diffuse rubbery texture to the lung. There were multifocal, pale, wedge-shaped areas present in the renal cortex. *Actinobacillus suis* was isolated from the heart valve lesions and multiple other organs, indicating a bacteraemia was present, most likely originating from the valvular lesions.

Actinobacillus suis is reported internationally as a cause of bacteraemia/septicaemia in pigs particularly affecting early-stage weaners.

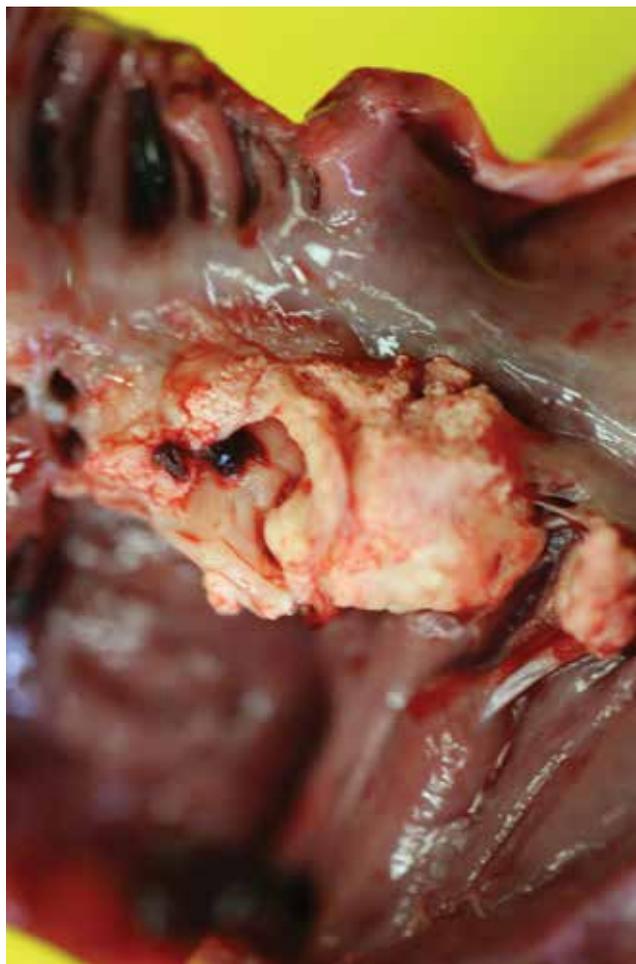


Figure 6: Vegetative valvular endocarditis of the right atrioventricular valve. Photo: Margaret Wilson.

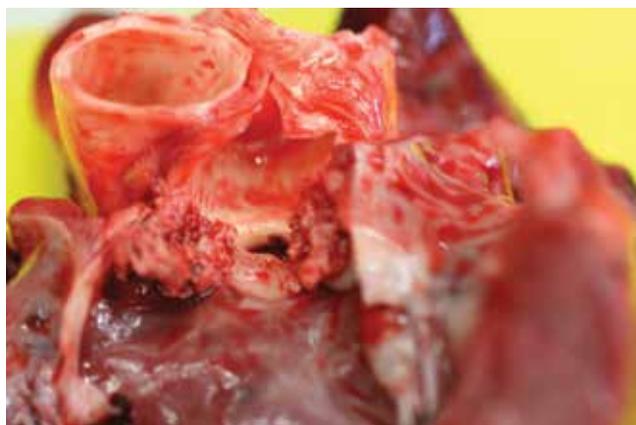


Figure 7: Vegetative valvular endocarditis of the aortic valve. Photo: Margaret Wilson.