Regional Veterinary Laboratories Report

August 2022

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 365 carcases and 31 foetuses during August 2022. Additionally, 1,384 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 August 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.
Also included is a brief mention of conditions to be aware of during November 2022, and an explanatory note on a new study into underweight ewes for which we invite participants.

CATTLE

Pneumonia and Blackleg were the most common diagnoses at necropsy in cattle in the RVLs during August 2022.

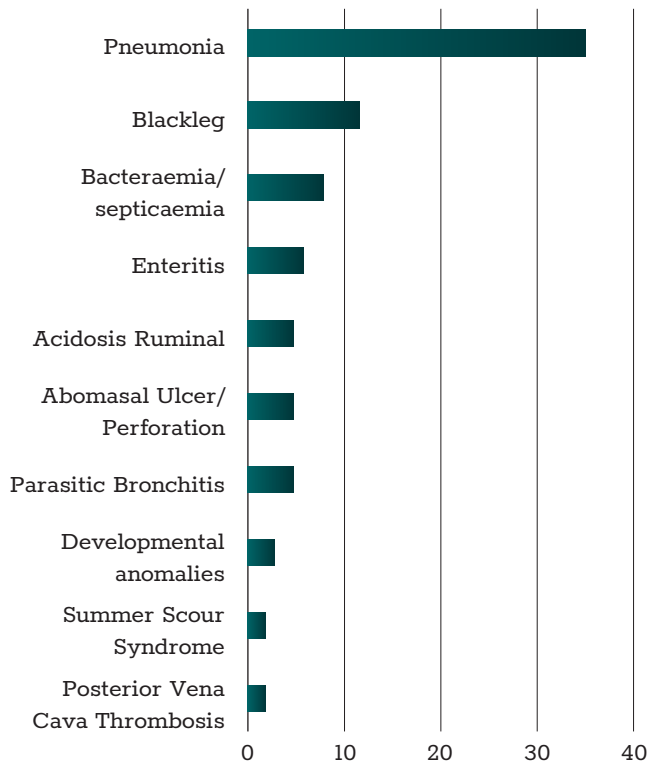

Table 1: The most common diagnoses in cattle submitted for necropsy in July 2022.

GASTROINTESTINAL TRACT

Johne's disease

Sligo RVL isolated *Mycobacterium avium* subspecies *paratuberculosis* (MAP), the causative agent of Johne's Disease, in a two-year-old Aubrac bull that had a history of ill-thrift and intermittent protracted diarrhoea over a period of about six months. It succumbed to fibrinous bronchopneumonia and pleuritis terminally.

RESPIRATORY TRACT

Pneumonia

A calf with a history of bloat and no other signs died and was submitted to Kilkenny RVL. It was the second case on the farm. There was severe pneumonia with approximately 60 per cent of lung volume consolidated. There was multifocal abscessation within the consolidated regions. *Pasteurella multocida* and *Trueperella pyogenes* were both cultured, and polymerase chain reaction (PCR) tests were positive for *Histophilus somni*. A review of pneumonia control on the farm of origin was recommended.
A five-month-old calf was submitted to Limerick RVL from a herd with a history of *Mycoplasma bovis-associated* pneumonia. Adhesions were noted between the lungs and costal pleura. Cranioventrally distributed pulmonary congestion was disclosed, with a focus of haemorrhage in the right lung. Signs of more chronic pneumonia, such as connective tissue scarring, were found in the cranial lobes. *Mycoplasma bovis* and *P. multocida* were detected in the lung tissue. Histopathology disclosed severe pneumonia with caseous foci typical of *Mycoplasma bovis* infection; a significant amount of connective tissue scarring suggested a chronic course. A diagnosis of Mycoplasma pneumonia was made.

Parasitic bronchitis

A four-month-old calf was treated for pneumonia but died and was submitted to Kilkenny RVL. Upon gross examination, the lungs were overinflated with multifocal bullae and multifocal 'ground glass' emphysema. There were small numbers of lungworms (*Dictyocaulus viviparus*) deep in the airways. Tests for viral agents returned a negative result. *Bibersteinia trehalosi* was cultured from the lung. *B. trehalosi* (previously classified as *Pasteurella trehalosi*) is a commensal organism of the tonsil and upper gastrointestinal tract. It is postulated that under stressful conditions the bacteria multiply and rapidly spread to the lungs. A diagnosis of parasitic or hoose pneumonia was made and a review of lungworm control was recommended.

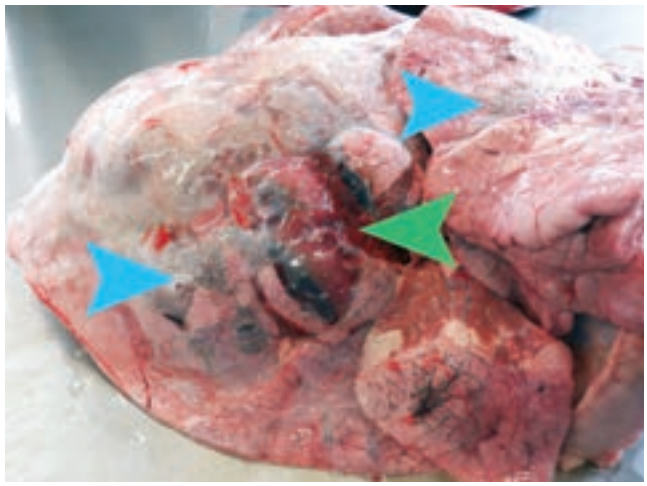

Figure 1: Emphysema presenting as bullae (green arrow) and as 'ground glass' emphysema (blue arrows) in a calf diagnosed with parasitic bronchitis. Photo: Aideen Kennedy.

Athlone RVL diagnosed several cases of lungworm/hoose pneumonia in August. One such case was a four-month-old weanling with a history of having been found dull and anorexic with no respiratory signs, although cohorts were coughing. It was the fourth recent loss in the group. It had been dosed for fluke and worms three to four weeks earlier and was treated with antibiotic and non-steroidal anti-inflammatory drugs. On gross post-mortem examination, the body condition was poor, weighing 105kg and the carcase had a "wet" appearance with serous atrophy of fat around kidneys and heart. There was bilateral, anteroventral, pulmonary consolidation and caudodorsal emphysema, and the lungs had a "meaty consistency". There were very high numbers of lungworm in the trachea and bronchial tree. There was a large, old, healed ulcer on a rumen pillar in the rumen and the contents were dry as was faeces. The strongyle egg count in the faeces was 1,300 eggs per gram (EPG). *P. multocida* was detected in the lungs by PCR. Histopathology of the lung showed a subacute-to-chronic broncho-interstitial pneumonia with lungworms visible and focal suppurative bronchopneumonia lesions. A diagnosis of parasitic pneumonia and secondary bacterial infection was made.

Figure 2: *Dictyocaulus viviparus* lungworms in the bronchial tree of a weanling. Photo: Denise Murphy.

Sligo RVL had three cases of patent hoose in calves under a year old in August.

URINARY/REPRODUCTIVE TRACT

Omphalophlebitis

A 16-day old calf was found dead and submitted to Kilkenny RVL. The calf was severely dehydrated. The lungs were diffusely congested, oedematous and felt heavy. There was milk in the rumen. There was a purulent umbilical infection, and the mesentery was adherent to the abdominal wall at the site of the umbilicus. There was a hepatic abscess, likely related to the umbilical infection. *T. pyogenes* and *Escherichia coli* were cultured from the liver and lung. Omphalophlebitis ('navel ill') and subsequent bacteraemia was diagnosed – a review of umbilical hygiene at calving was recommended.

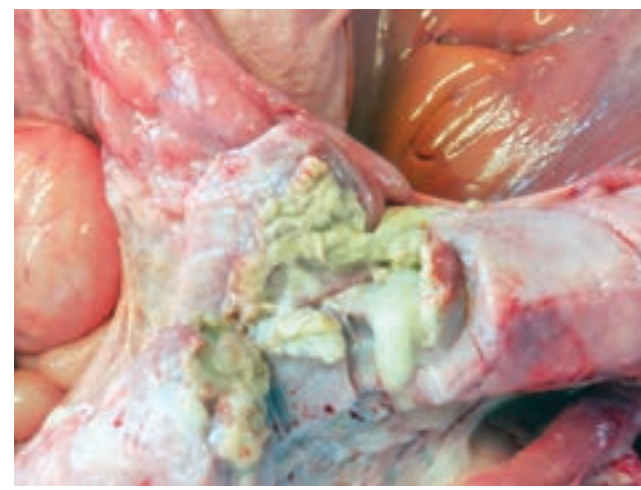

Figure 3: A purulent infection in the umbilicus of a calf. Photo: Aideen Kennedy.

CARDIOVASCULAR SYSTEM

Septal defects

Sligo RVL examined a two-month-old calf with an atrial septal defect that had been sick from birth and nursed along.

Figure 4: An enlarged heart of a two-month-old calf in which an atrial septal defect was diagnosed. Photo: Colm O'Muíreagaín.

A four-month-old Limousin-cross suckler calf was submitted to Limerick RVL. The animal had been lagging behind the rest of the group and struggling to breathe, collapsed and

died the following day. Necropsy disclosed hydrothorax, hydroperitoneum and cardiomegaly , all attributable to congestive heart failure., all attributable to congestive heart failure. A large ventricular septal defect was discovered in the heart.

MUSCULOSKELETAL

Clostridial myositis (blackleg)

Two six-month-old weanlings were found dead with no history of premonitory clinical signs and referred to Kilkenny RVL. On gross examination, there were multiple muscles with dry, black myositis (blackleg), both also had a mild fibrinous pericarditis. *Clostridium chauvoei*-positive fluorescent antibody technique (FAT) results were obtained from both. A review of vaccination protocols was recommended with use of a multivalent clostridial vaccine advised.

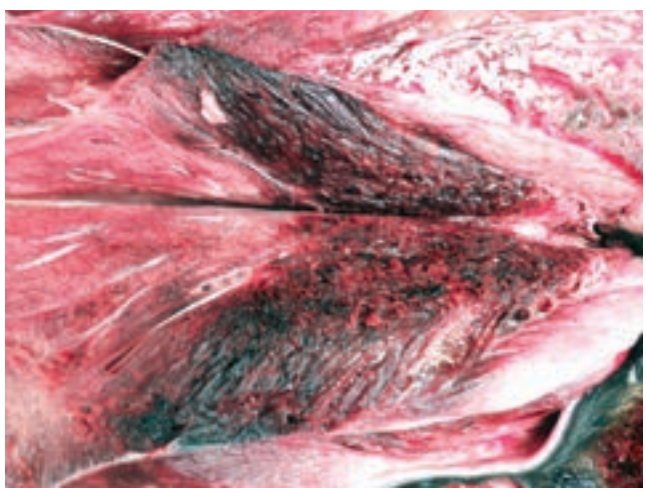

Figure 5: Dry, black myositis lesions in skeletal muscles, characteristic of blackleg. Photo: Aideen Kennedy.

Two five-month-old Friesian heifer calves were submitted to Limerick RVL for necropsy. The animals had recently moved to a field where there had been recent land reclamation work. Having had no clinical signs the previous day, the two animals were stiff and depressed, unwilling to stand without assistance. No vaccination for clostridial diseases had been carried out. Findings at necropsy included blackleg-like lesions in the shoulder muscles and mild fibrinous pericarditis. FAT results were positive for *C. chauvoei*. A diagnosis of blackleg was made.

MISCELLANEOUS

Infectious Necrotic Hepatitis 'black disease'

Athlone RVL examined a two-year-old Aberdeen Angus cow that had been found dead. Carcase preservation was very poor; the carcase tissues were very autolysed and haemorrhagic. There was subcutaneous oedema and haemorrhage in ventral sternal and abdominal muscles. There was a large, raised haemorrhagic lesion, 10 to 12cm in diameter, on the diaphragmatic surface of the liver. The spleen was enlarged and pulpy, the kidneys were dark red/brown and autolysed, and the lungs were autolysed. The uterus and urinary bladder were autolysed and disintegrating, and no urine was obtainable. One eye was scavenged, and the other was ruptured. Smears of the liver lesion were positive for *Clostridium novyi* using a fluorescent antibody technique (FAT). Histopathology of the lesion was not possible due to the advanced autolysis. A diagnosis of infectious necrotising hepatitis ('black disease') was made and advice was given regarding the vaccination of comrades with a multivalent clostridial vaccine, and a review of liver fluke control practices on farm was carried out.

Figure 6: A raised haemorrhagic and necrotic lesion typical of Black disease in the liver of a cow. Photo: Denise Murphy.

Septicaemia

A two-month-old calf was found dead and referred to Kilkenny RVL. It was the fourth case on the farm. There were adhesions between the pleura and the thoracic wall, and adhesions to the pericardium. The lungs were heavy and oedematous. There was cranioventral consolidation affecting approximately 30 to 40 per cent of the lungs. There was petechiation on the serosal surfaces of both kidneys. There was very fluid content in the small intestine. *Salmonella* Dublin was cultured from multiple organs. The importance of hygienic measures was advised given the zoonotic nature of *Salmonella*.

Figure 7: Pinpoint haemorrhages in a calf which was diagnosed with *Salmonella* Dublin septicaemia. Photo: Aideen Kennedy.

DISEASES OF CONCERN FOR NOVEMBER

In recent years, diseases found to be of concern in November are often those associated with housing. These include respiratory disease in recently housed animals. Abortions in cows are a frequent finding after housing, particularly abortions caused by *Salmonella* Dublin. In certain parts of the country, acute fascioliasis may be seen in lambs in November.

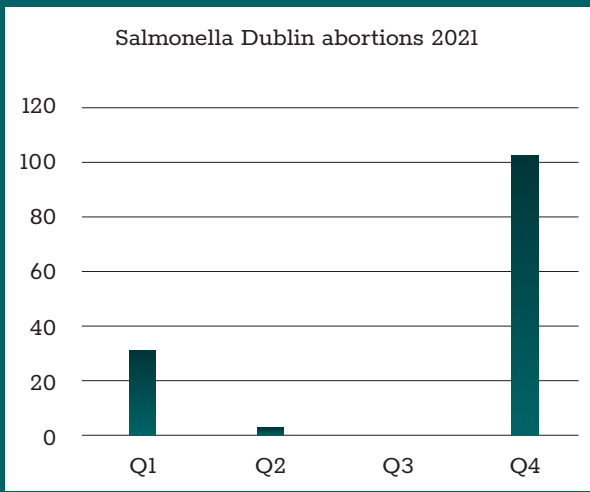

Table 2: *Salmonella* Dublin abortions primarily occur in the fourth quarter of the year.

Diseases of turkeys may also increase in prevalence as birds are reared in increased numbers for the seasonal market, for example histomoniasis or 'blackhead disease.' *Histomonas meleagridis*, a protozoan parasite is the causative agent of histomoniasis ('blackhead disease'). *H. meleagridis* is mainly spread via the egg of the caecal nematode, *Heterakis gallinarum*. Chickens act as a reservoir for *H. gallinarum*. Eggs can remain viable in the environment for years. Earthworms occasionally act as hosts for *H. gallinarum* larvae containing *H. meleagridis*. When turkeys and chickens ingest infected earthworms, they can become infected with both *H. gallinarum* and *H. meleagridis*. In turkeys, direct cloacal contact or contact with infected faeces can be a factor in transmission. Chickens can be affected but the disease is more severe in turkeys.

Figure 8: The target-shaped liver lesions of histomoniasis in a turkey. Photo: Aideen Kennedy.

Clinical signs of avian histomoniasis include reduced appetite, listlessness and yellow droppings in the later stages. Turkeys normally succumb to infection, but chickens may recover. The primary pathology lesions of histomoniasis are in the ceca, where a yellowish caseous exudate develops or, in later stages, evolves into a dry, cheesy core. Occasionally, the caecal wall is eroded and perforated, leading to peritonitis. Liver lesions can appear in turkeys, which occur six to eight days after infection. No treatment is available. To prevent this disease, turkeys should not be raised with other Galliformes e.g., chickens.

SHEEP

Parasitic gastroenteritis and pneumonia were the most common diagnoses at necropsy in sheep in the RVLs during August 2022.

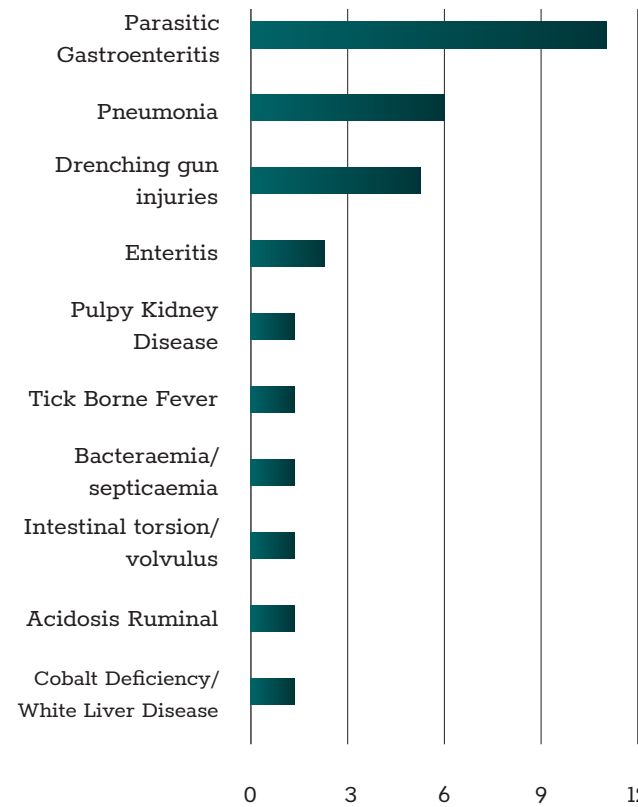

Table 3: The most common diagnoses in sheep submitted for necropsy in August 2022.

GASTROINTESTINAL TRACT

Ruminal acidosis

A four-month-old Texel lamb was submitted to Limerick RVL for necropsy. This was a single suckling lamb at grass with access to a creep feeder, that had been found dead suddenly. Two other lambs were displaying pyrexia and neurological signs. Necropsy disclosed high-grain, yellow, rumen contents; bloody abomasal contents with some shallow ulcerative lesions. Watery small and large intestinal contents and pulmonary and hepatic congestion were noted also. The ruminal content pH was 4.97 which is very low and suggests acute acidosis (normal Rumen pH is 5.5-7.0). A

diagnosis of acute ruminal acidosis was made.
Ruminal acidosis develops in ruminants that have ingested large amounts of feed rich in fermentable carbohydrates (typically grain overload). As a result, large quantities of volatile fatty acids and lactic acid are produced which reduce ruminal pH to non-physiological levels. Once ruminal pH falls below 5, this precipitates the death of normal ruminal flora and the proliferation of lactobacilli, further propagating lactic acid production. The osmotic pressure in the ruminal fluid increases, pulling fluid into the rumen and leading to haemoconcentration with subsequent circulatory collapse.
There is marked variation in the quantity of carbohydrate required to kill an animal, as tolerance to carbohydrate feeding develops if it is introduced gradually into the diet. However, even in a tolerant animal, a sudden increase in the energy value of the ration or quantity of ration fed, can lead to ruminal acidosis.

Haemonchus contortus
Multiple cases of *Haemonchus contortus* were recorded in Kilkenny RVL in both sheep and goats. *H. contortus* is often called the 'barber's pole worm' due to its resemblance to the red and white barber's pole when the spiral intestine is full following a blood meal and contrasts with the paler uterus it is wrapped around. Diarrhoea is not a typical clinical sign associated with *H. contortus* infection. Clinical signs include anaemia, with pale mucous membranes, sub-mandibular oedema (bottle-jaw), hyperpnoea and tachycardia. The pathogenesis is associated with the haematophagous (blood-feeding) activities of the adult and developing larvae.

Necrotic pharyngitis (dosing gun injury)
Athlone RVL examined a two-year-old ewe with a history of having been found dead. It was the third ewe that had been found dead in a three-week period. Her body condition was moderate to poor, with a bodyweight of 58kg. There was a necrotic foul-smelling lesion in the left pharynx and left side of the tongue containing a large blood clot. The liver and lungs were pale and other organs were unremarkable. A diagnosis of necrotic pharyngitis, typical of a dosing gun injury was made. Advice regarding the review of dosing equipment and technique was given. Typically, these injuries are related to sharpened edges on dosing guns, poor restraint of the animal during dosing, or excessively forceful or clumsy operator technique.

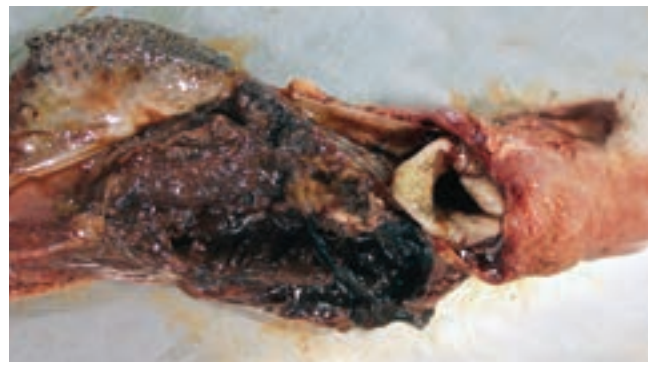

Figure 9: A necrotic lesion in the pharynx and tongue containing a large blood clot, typical of a dosing gun injury. Photo: Denise Murphy.

CARDIOVASCULAR SYSTEM

Vegetative endocarditis
Sligo isolated *Erysipelothrix rhusiopathiae* from a two-year-old ewe that had bilateral vegetative endocarditis.

NERVOUS SYSTEM

Louping ill
Sligo RVL diagnosed Louping ill as the cause of death in a one-year-old lamb that had a history of rapid progression of nervous signs: flicking ears; twitching head; recumbency; paddling, and then death. Six comrades had perished in a similar fashion and there were more animals sick at the time this carcase was submitted to the laboratory. The causative flavivirus was detected in brain tissue via PCR. 'Castor bean ticks' (*Ixodes ricinus*), which carry this virus, were present on the fleece.

MISCELLANEOUS

Cobalt deficiency
Sheep with cobalt deficiency have been referred to Kilkenny RVL. They present with sub-optimal thrive and frequently have concurrent high parasite burdens. On gross post-mortem examination, they have crusting of the pinnae of the ears. Occasionally, histopathological changes suggestive of ovine white liver disease are seen. Low liver cobalt levels are detected. A review of cobalt deficiency is recommended. Cobalt is not stored in the body, and, in deficient areas, frequent supplementation is key to optimising productivity and preventing clinical disease; with cobalt supplementation added to most routine operations like shearing, dipping, etc.

Figure 10: An example of the crusting seen on the pinnae of sheep with cobalt deficiency. Photo: Maresa Sheehan.

THIN EWE STUDY

The Regional Veterinary Labs, in conjunction with Teagasc, are carrying out a Thin Ewe Study from September 1, 2022 to September 1, 2023.

It aims to provide information on causes of chronic ill thrift in ewes in Irish sheep flocks, and is similar to a UK study conducted by the APHA and published recently in the Veterinary Record.

The role of 'iceberg diseases', together with other causes of weight loss/failure to thrive will be investigated. The five main 'iceberg' diseases affecting sheep are maedi-visna disease, caseous lymphadenitis, ovine pulmonary adenomatosis (OPA or 'Jaagsiekte'), Johne's disease and border disease. Flock owners will arrange to send up to three thin ewes to their local Regional Veterinary Laboratory (RVL) for euthanasia and post-mortem examination. **The RVLs are carrying out this testing free of charge to encourage participation.**

Flock owners that have issues with ill-thrift in ewes despite adequate nutrition should be encouraged to submit three ewes to the RVL. Some practices may be carrying out TASAH sheep visits at present; this may be an opportune time to assess and discuss ill-thrift in ewes with their client. **All results from this study will be sent back to the flock owner's vet.**

If you have any queries on the study or whether to get a farmer client to participate, please contact your local Regional Veterinary Laboratory before referring any material.