

REGIONAL VETERINARY LABORATORIES REPORT

May 2024

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 618 carcasses and 25 fetuses during May 2024. Additionally, 1,566 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 May 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.

Cattle

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

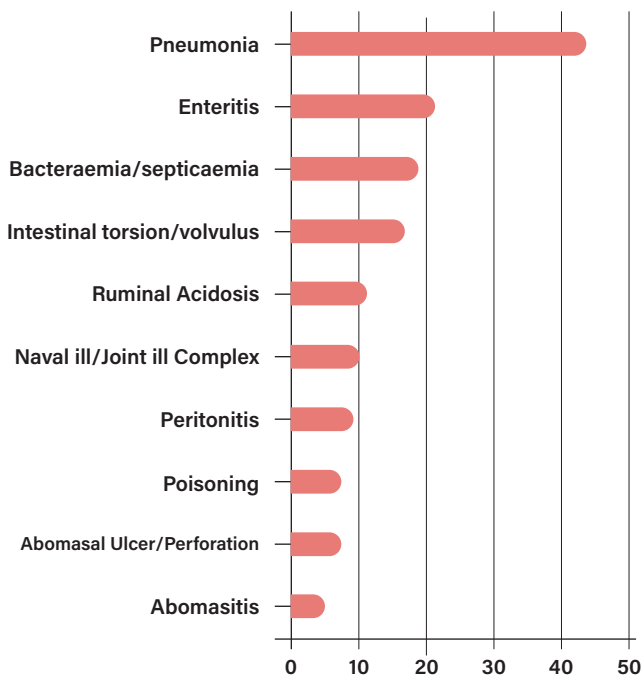


Table 1: The most common diagnoses in cattle submitted for necropsy in May 2024.

Gastrointestinal Tract



Figure 1: Porridge-like ruminal contents in a case of ruminal acidosis. Photo: Maresa Sheehan.

Ruminal acidosis

A number of calves were submitted to Kilkenny RVL in May with ruminal acidosis. Large quantities of concentrates and porridge-like contents were seen in the rumens of these calves, and in one of these calves a bloat line was also seen. High concentrate feeding and/or a sudden change of diet may predispose to development of ruminal bloat. Suggested hypotheses for the aetiology of these submissions may include increased concentrate feeding to calves to compensate for poor grass growth due to weather conditions in April and May.



Figure 2: A bloat line. The cervical portion of the oesophagus is reddened through venous congestion while the thoracic oesophagus is pale and blanched due to pressure from ruminal bloat. Photo: Maresa Sheehan.

Mycotic rumenitis

A three-week-old calf was submitted to Kilkenny RVL with a history of diarrhoea. Gross post-mortem examination revealed multiple plaques and ulcers affecting the mucosal surface of the forestomachs. There were abomasal ulcers. There was milk in the forestomachs. There were multiple suspected infarcts and foci of necrosis affecting the kidneys. Histopathology of the rumen showed a severe, diffuse, necrotising rumenitis with myriad intra-lesional fungal hyphae. A diagnosis of suspected systemic fungal infection was made. Vasculitis is a feature of fungal infection and is the most likely cause of the renal infarction seen. Rumen milk feeding can result in ruminal acidosis and subsequent mucosal damage enabling fungal infection.

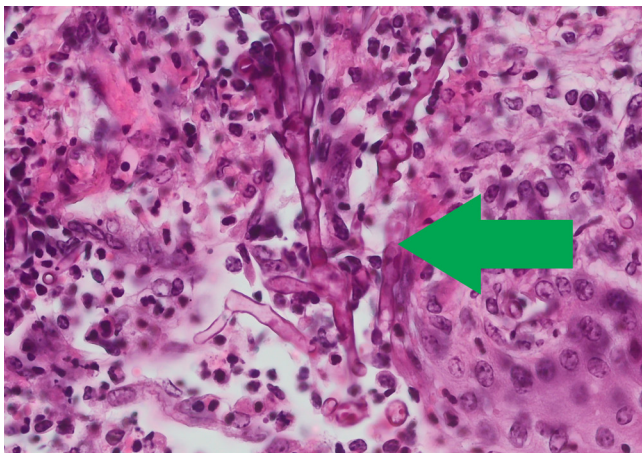


Figure 3: Fungal hyphae (arrow) in the ruminal mucosa. Photo: Maresa Sheehan.

Intestinal volvulus

Athlone RVL examined a ten-week-old calf with a history of sudden death. There was marked abdominal distension with reddened loops of small intestine and rostral displacement of the caecum, and a torsion of the intestines was palpable. The small intestinal contents were haemorrhagic, and the faeces were loose and chocolate brown. The ruminal contents pH was 5.2 which is at the low end of what would be regarded as normal. It has been suggested that altered intestinal motility due to ingestion of a rapidly fermentable substrate may predispose to intestinal volvulus.



Figure 4: Reddened loops of congested small intestine in a case of intestinal volvulus. Photo: Denise Murphy.

Similarly, Sligo RVL diagnosed coccidiosis in several calves and lambs in May 2024. In one case, a three-month-old calf, which had been found dead, presented with a volvulus on post-mortem examination. Volvulus or intestinal torsions, in which no mechanical factor has been identified, are associated with changes in intestinal motility, often caused by management or dietary changes, infections (e.g., parasites), enteritis, peritonitis, or electrolyte abnormalities. In this case, coccidiosis was the most likely causative factor.

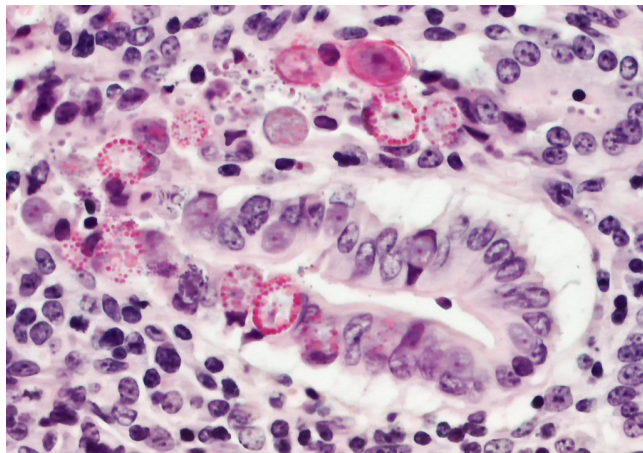


Figure 5: Multiple protozoal life stages in the intestines in a case of coccidiosis in a calf. Photo: Rebecca Froehlich-Kelly.

Jejunal haemorrhagic syndrome

A six-year-old cow which was euthanised with suspected peritonitis that failed to respond to treatment was submitted to Kilkenny RVL. On necropsy, there was peritonitis. There was a blood clot in the jejunum lumen approximately 40cm in length. The intestines proximal to the blockage were very full, with liquid contents, and there were some bloody contents caudal to the clot. No significant agents were identified on laboratory tests and jejunal haemorrhagic syndrome was diagnosed. Jejunal haemorrhagic syndrome occurs rarely and sporadically. It is most commonly reported in dairy cows. Mechanical obstruction of varying lengths of jejunum with sloughed mucosa and clotted blood is characteristic. The aetiology is unknown.



Figure 6: A blood clot in the jejunum in a case of jejunal haemorrhagic syndrome. Photo: Aideen Kennedy.

Infectious bovine rhinotracheitis

Two one-week-old calves were submitted to Kilkenny RVL, the owner reported "strange noises" coming from their throats and a reluctance to drink. On necropsy, there were multifocal pinpoint raised white foci on the larynx, oesophagus, and rumen. One calf had pneumonia with approximately 50 per cent of the lung tissue consolidated. The other animal had omphalophlebitis ('navel ill'). Zinc sulphate turbidity (ZST) results were suboptimal, indicating failure of passive transfer of colostral immunity. Both calves tested positive for bovine herpesvirus 1 (BHV1), the causative agent of infectious bovine rhinotracheitis (IBR). Though

principally inflicting pathological changes to the respiratory and reproductive systems, the virus has the ability to induce raised lesions in the alimentary system.



Figure 7: Raised irregular lesions in the ruminal mucosa of a week-old calf from which bovine herpesvirus 1 was detected. Photo: Aideen Kennedy.

Summer Scour Syndrome

What is it?

Diarrhoea and upper digestive tract ulceration in at least some animals in a group of weaned dairy calves less than 12 months of age on a grass diet. It can occur any time after turn-out-in spring, summer, or autumn. Other common causes of diarrhoea of calves at grass – e.g., coccidiosis, parasitic gastroenteritis and copper-molybdenum imbalances – must be ruled out before a diagnosis of summer scour syndrome is made. Investigation, control and treatment of summer scour syndrome require close co-operation between herd owner and veterinary practitioner.

Clinical Signs

Clinical signs include:

- scour/diarrhoea – not just loose faeces;
- rapid weight loss – frequently leading to chronic lack of thrive;
- upper digestive tract ulceration – oral/muzzle ulcers may be seen in at least some calves in the group;
- weakness, dullness, poor coat;
- dehydration.

This condition can progress to death if not rapidly controlled.

Risk Factors

Research into the causes of Summer Scour Syndrome in calves are ongoing. Currently recognised risk factors include:

- calves with access to 'good' grazing on nitrogen-rich grass with a high crude protein content and low fibre content;
- calves that have been prematurely or poorly weaned appear to be more at risk.

Treatment

These calves don't respond to traditional scour treatments, and it is advised that they are taken off pasture, rehoused, and fed good quality roughage

and concentrates until symptoms resolve. Successful treatment requires early intervention.

Prevention

Affected calves may fall behind their daily gain targets and struggle to recover daily gains lost during their illness. Therefore, prevention is advised. Prevention measures include:

- correct weaning management of calves starting from early introduction of good quality calf rations and forage to the diet to allow optimum rumen maturation;
- gradual weaning onto grass diet with continued adequate access to concentrates and good quality hay and straw;
- choosing a weaning pasture with higher fibre grazing may also reduce the risk of Summer Scour in calves.

Animal Health Ireland information on calf weaning may be accessed at:

<https://animalhealthireland.ie/assets/uploads/2023/03/AHI-Bulletin-March-2023-FINAL.pdf?dl=1>

Respiratory Tract

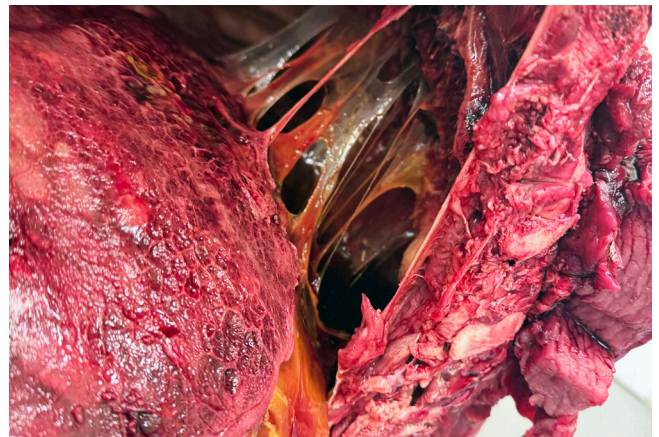


Figure 8: Fibrinous pleural adhesions on the costal pleural surface of a bullock. Photo: Sara Salgado.

Fibrinous Pleuropneumonia

Two fourteen-month-old bullocks were submitted to Dublin RVL. They were bought by the same cattle dealer but delivered to neighbouring farms in two different lots, each lot with fourteen animals. They were both found dead. On post-mortem examination, there was a severe, fibrinous pleuritis and pericarditis with bilateral pleural adhesions on the costal surface. There was cranioventral consolidation affecting approximately 50/60 per cent of the lung parenchyma. On the lungs cut section, there was a marbling pattern. *Mannheimia haemolytica* was cultured from both lungs and from the liver in one animal. Polymerase chain reaction (PCR) testing for *M. haemolytica* was also strongly positive. On histopathology, there was severe, fibrinous, and suppurative pleurisy and bronchopneumonia. The alveoli and small bronchioles were filled with fibrin, oedema, red blood cells, and the necrotic leukocytes had streaming chromatin characteristic of 'oat cells'. Pasteurellaceae are a family of bacteria that are common inhabitants of the

upper respiratory tracts and tonsils of healthy ruminants, however, following a period of stress or management changes (commingling, transportation, and dietary changes etc.) these bacteria can cause systemic pasteurellosis, pneumonia or septicaemia in feeding animals. A review of respiratory disease management (including vaccination) was recommended.



Figure 9: Severe fibrinous pleuritis and pericarditis in a bullock. Photo: Sara Salgado.

A twelve-week-old, Belgian blue cross, male calf was submitted to Limerick RVL. The calf did not respond to treatment for pneumonia. Post-mortem examination revealed a severe pneumonia in cranial lobes with adhesions to the pericardium and a generalised peritonitis. *M. haemolytica* was cultured from both the lungs and intestines. *M. haemolytica* appears to occur most often in animals that have undergone recent stress such as transportation, weaning and change of diet; commingling animals from unrelated farms or concurrent viral infection are key factors in its pathogenesis.



Figure 10: Fibrinous peritonitis in an animal with a concurrent fibrinous pleuropneumonia. Photo: Brian Toland.

A one-week-old calf was submitted to Kilkenny RVL. It had been reluctant to drink. On examination, there was fibrinous pleuritis, pericarditis, and pneumonia. Approximately 40 per cent of the lung tissue was consolidated. The navel was oedematous and a review of umbilical hygiene at calving was recommended. *M. haemolytica* was cultured from multiple organs. *M. haemolytica* has been associated with polyserositis in calves.



Figure 11: Fibrinous pericarditis, diagnosed along with fibrinous pleuropneumonia. Photo: Aideen Kennedy.

Parasitic bronchitis

Athlone RVL examined a one-year-old heifer at grass with a history provided of being found coughing the previous morning with a slight temperature. It failed to respond to treatment and died that evening. On post-mortem examination, there was severe, bilateral, subpleural 'ground glass' emphysema affecting approximately 60 per cent of the lung parenchyma. Interlobular septa were expanded by oedema, fibrin, and emphysema. Multifocally, there were thin white lungworm (*Dictyocaulus viviparus*) deep within the distal bronchial tree. Numerous organised blood clots were located bilaterally in bronchial tree and trachea. Atelectic lobules were juxtaposed with aerated lobules. On histopathology, there was severe, multifocal-to-coalescing hyaline membrane formation, sub-pleural and interlobular emphysema. Bronchial epithelial necrosis was seen multifocally. There was moderate-to-severe multifocal occupation of the alveoli and airways by eosinophils, oedema, and neutrophils. Rare type 2 hyperplasia was present. A diagnosis of parasitic bronchitis was made. A review of grazing management and parasite control programme was advised. Close observation must be carried out throughout the grazing period for evidence of lungworm infection. Due to a relatively short prepatent period in optimum conditions and potential for large infectious doses on pastures, lungworm infection can cause serious problems even while egg counts for other parasites are low.

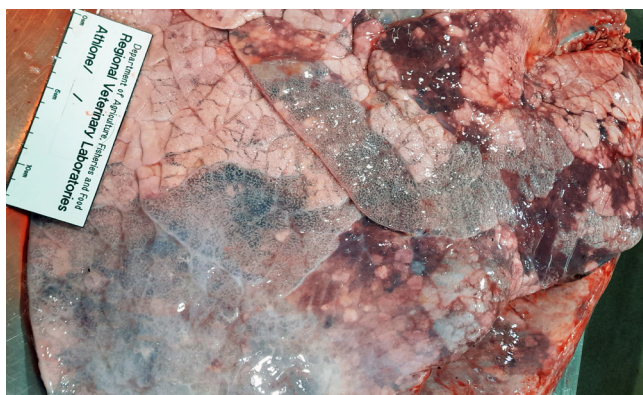


Figure 12: Subpleural emphysema in a case of parasitic bronchitis giving the appearance of 'ground glass'. Photo: Aoife Coleman.

An 18-month-old bullock was submitted to Kilkenny RVL with a history of scouring and weight loss. On examination,

there were multiple lungworm visible in the airways. The abomasal mucosa had a cobblestone appearance, and the intestinal contents were very liquid. A strongyle egg count of 2,000 eggs per gram (EPG) was recorded, and parasitic gastroenteritis and parasitic bronchitis were diagnosed. A review of parasite control was advised.

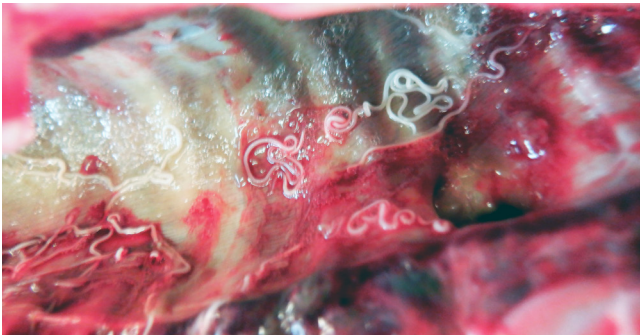


Figure 13: Adult lungworm (*Dictyocaulus viviparus*) in the trachea in a case of parasitic bronchitis. Photo: Aileen Kennedy.

Urinary/Reproductive Tract

A stillborn, full term, Charolais calf was submitted to Limerick RVL, the calf's dam had been slow to calve and did not dilate fully. Necropsy findings included meconium staining, lungs congested with fluid in the trachea and no lung expansion, multifocal pinpoint haemorrhages on the ribcage, and no evidence of rib fractures. No pathogens were identified on culture or PCR, copper and selenium were within reference range. Histopathology of the lungs revealed squames and fragments of keratin visible in the airways indicative of foetal hypoxia; the thyroid had no significant findings. Changes seen, including meconium staining, can indicate intrauterine hypoxia and neonatal distress. Differentials include: slow parturition, for example, when dams are moved or disturbed in late stage of calving; foetal oversize; subclinical hypocalcaemia; or placentitis (no placenta was submitted in these cases). Advised review of husbandry around calving and diet, including minerals in the dry period, recommended taking blood samples from dry cows close to calving for transition cow mineral analysis. Cows should ideally be sampled for calcium within 24 hours of calving, this is to make sure you don't miss hypocalcaemia that normalised quickly after calving.

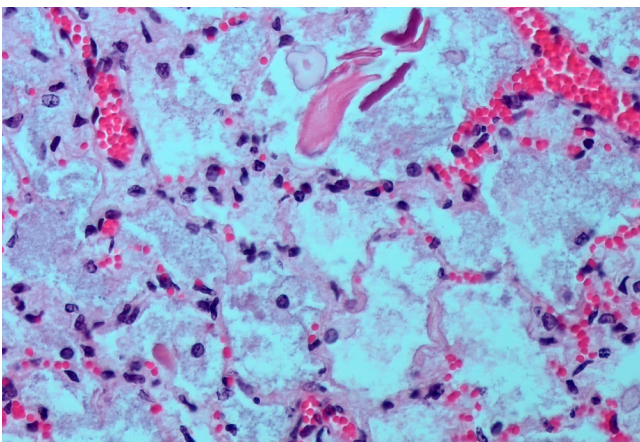


Figure 14: Eosinophilic-staining squamous cell remnants in the alveoli of a stillborn calf, indicating foetal hypoxia or distress. Photo: Brian Toland.

Cystitis and septicaemia

A one-week-old calf which had presented with hindlimb weakness was submitted to Sligo RVL. On post-mortem examination, there was mild peritonitis. The bladder was expanded with urine, and there were haemorrhages on the mucosa. The remnant umbilical vessels on the bladder pole were enlarged and covered with fibrin. The ureters were expanded, and the kidneys filled with urine. *Proetus vulgaris* was cultured from the urine. There was a moderate faecal count of *Cryptosporidium* oocysts. ZST result was at 13 units, which is judged to be suboptimal. On histopathology, there was chronic, diffuse, mild fibrosing hepatitis. Cystitis with likely septicaemia was diagnosed as cause of death. *P. vulgaris* has been reported as a common pathogen involved in urinary tract infections in bovines. An ascending umbilical infection cannot be excluded as initial cause.

Cardiovascular System

Ventricular septal defect

A six-week-old, Limousin cross, suckler calf was presented to Limerick RVL with a history of sudden death. Post-mortem revealed an enlarged heart with a ventricular septal defect. This is a birth defect of the heart where there is a hole in the wall that separates the two lower chambers of the heart.

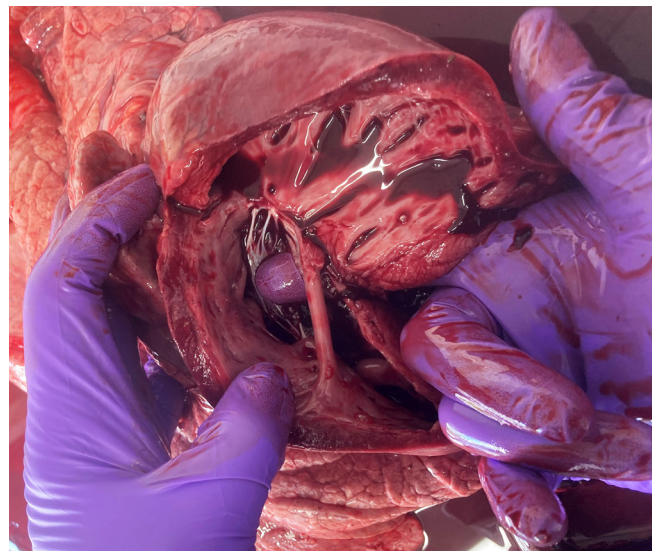


Figure 15: A ventricular septal defect. Photo: Brian Toland.

Nervous System

Listeriosis

A two-year-old Limousin heifer with a history of stiff gait, poor coordination, blindness, and recumbency was submitted to Limerick RVL. On necropsy, there was left-sided pulmonary congestion, likely to be hypostatic congestion. No gross lesions were seen in the liver, kidneys, gastrointestinal tract, or brain. The cerebrospinal fluid was clear in colour. No fluorescence was seen on examination of the brain with an ultra-violet lamp. No significant bacterial pathogens were isolated on routine culture. Histopathology disclosed extensive perivascular cuffing in the mid and hindbrain sections, localised perivascular cuffing in the cerebellum, microabscessation and a mild meningitis. The histological findings are consistent with encephalitis due to *Listeria* sp.

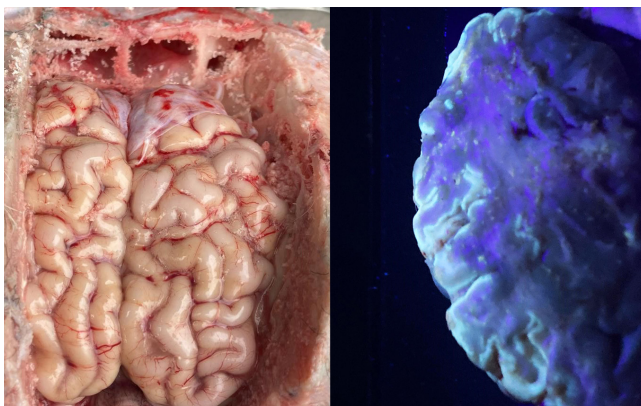


Figure 16: Yellow discolouration (left) and apple green fluorescence under ultraviolet light (right) of the brain in a case of cerebrocortical necrosis. Photo: Brian Toland.

Cerebrocortical necrosis

A three-month-old Friesian heifer calf on pasture and meal did not respond to treatment for meningitis and suspected cerebrocortical necrosis (CCN). Necropsy revealed a swollen brain with pale yellow discolouration which was spongy to touch. Examination of the brain under ultraviolet light (Wood's Lamp) displayed positive UV fluorescence and CCN (laminar cortical necrosis) was confirmed upon histopathology. CCN is most common in young cattle fed a high-concentrate and low-roughage diet, such as lush grass (high in sugars and low in fibre), resulting in rumen acidosis and destruction of microbes producing thiamine. In addition to thiamine deficiency, high sulphur intakes, water deprivation/salt poisoning, or lead poisoning can cause CCN; other potential underlying causes include thiaminase rich plants, such as bracken, or deficiency of cobalt.

Musculoskeletal



Figure 17: Omphalitis or 'navel ill'; in a ten-day-old calf. Photo: Denise Murphy.

Omphalitis and arthritis

Athlone RVL examined a ten-day-old calf that was found 10 days previously, weak and recumbent, and was treated for pneumonia. A few days later the joints had swollen, and the animal was treated for joint ill, but didn't respond and died. At necropsy, all four limbs were swollen, especially the right hindlimb, and there was a severe necro-suppurative cellulitis and suppurative arthritis in the hock and stifle joints. All joints in the other four limbs had a suppurative arthritis also.

The navel was enlarged and there was a necrotic infection in the umbilical vessel extending to the liver.



Figure 18: Arthritis or 'joint ill' and necrotic cellulitis in a ten-day-old calf. Photo: Denise Murphy.

The liver was enlarged and there were multifocal, variably sized, necro-suppurative lesions in the parenchyma of the liver. A diagnosis of omphalophlebitis and polyserositis ('navel and joint ill') and necro-suppurative cellulitis with hepatic abscessation was made.



Figure 19: Multifocal, variably sized, necro-suppurative lesions in the parenchyma of the liver. Photo: Denise Murphy.

Poisonings

Athlone RVL diagnosed several cases of poisoning in cattle caused by ragwort (*Jacobaea vulgaris*) during May, with multiple deaths reported in affected herds. One such case was a two-year-old heifer that presented with a history of being sick and agitated for two to three days, became depressed-looking and developed tenesmus. There was marked ascites, bowel oedema and oedema of abomasal folds.

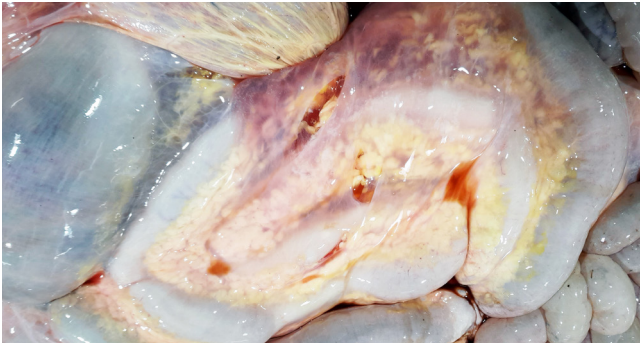


Figure 20: Bowel oedema in a case of ragwort poisoning. Photo: Denise Murphy.

The carcase was pale, and the liver was pale and difficult to cut. Histopathology of the liver showed severe extensive bridging fibrosis, megalocytosis, biliary proliferation, and biliary occlusion. These findings are consistent with pyrrolizidine alkaloid toxicity caused by ingestion of plants, such as ragwort (*J. vulgaris*). There was also vacuolation of neuropil at the grey-white matter interface in the basal ganglia of the brain indicative of a hepatic encephalopathy.



Figure 21: A pale, and difficult-to-cut liver in a case of ragwort poisoning. Photo: Denise Murphy.

Miscellaneous Mesothelioma

The carcase of a five-year-old cow which had been losing condition after calving was submitted to Sligo RVL. On post-mortem examination, there were multifocal, variable sized, nodular, pale, proliferative, and encapsulated masses throughout the abdomen. The mesentery and the serosal surfaces were mainly affected. On cross-section, the masses had a creamy pale consistency. There was a large volume of abdominal and thoracic fluid. A mesothelioma was diagnosed and ruled as the most likely cause of death. Tuberculosis (TB) testing was carried out as severe cases of visceral TB may have a similar appearance. TB was ruled out.



Figure 22: Multifocal nodular growths on the mesentery in a cow with mesothelioma. Photo: Shane McGettrick.

Lymphosarcoma

Athlone RVL examined an eleven-month-old weanling – with a history of swelling around the scrotum and all around the body – which had been treated with antibiotics without response, and died. There was marked subcutaneous oedema from the chin extending down along the neck and brisket and ventral abdomen to the scrotum. There was a large mass in the cranial thorax measuring circa 25cm x 25cm x 20cm and weighing 7kg. It was firm and cream coloured with focal areas of darker yellow on cross-section. There was moderate ascites, and the liver was slightly jaundiced with a mild nutmeg pattern on cross-section. The right testicle was enlarged and was abscessed on cross-section and the left testes was unremarkable. Histopathology of the mass confirmed it to be a thymic lymphoma. PCR testing for enzootic bovine leukosis (EBL), an exotic viral disease, returned a negative result. Thymic lymphosarcoma is a form of sporadic bovine leukosis (SBL) which is seen in calves and young stock and has no known cause. Sporadic bovine leukosis occurs in three forms: juvenile, thymic and skin forms. The marked subcutaneous oedema seen in this case, and the nutmeg liver, are likely due to the mass in the chest impairing the return of blood to the heart. The testicular abscess was an incidental finding in this case.



Figure 23: A thymic lymphosarcoma found in the cranial thorax. Photo: Denise Murphy.

The carcase of a six-year-old cow was delivered to Sligo RVL. The cow had presented with difficulties with swallowing and breathing after dosing with a bolus. The head and neck lymph nodes were noticed to be swollen. After treatment, the cow improved drastically but had to be euthanised after 10 days. On post-mortem examination, there was diffuse lymphadenopathy involving all lymph nodes in the head, neck and abdomen. The left kidney was infiltrated by a pale fleshy mass and the right kidney presented with extensive subcapsular haematoma. There was an extensive mass extending along the oesophagus and trachea from larynx to thoracic inlet approximately 10cm in diameter. On histopathology, the masses were unencapsulated and were composed of diffuse expansive sheets of neoplastic lymphocytes, multifocal areas of necrosis, and haemorrhage. Sporadic lymphoma was diagnosed in this cow, EBL was ruled out by laboratory testing.

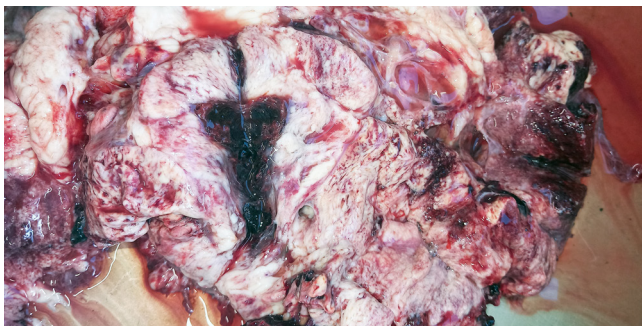


Figure 24: Lymphoma in kidney of a cow. Photo: Rebecca Froehlich-Kelly.

Sheep

Enterotoxaemia, bacteraemia/septicaemia and tick-borne fever were the most common diagnoses at necropsy in sheep in the RVLs during May 2024.

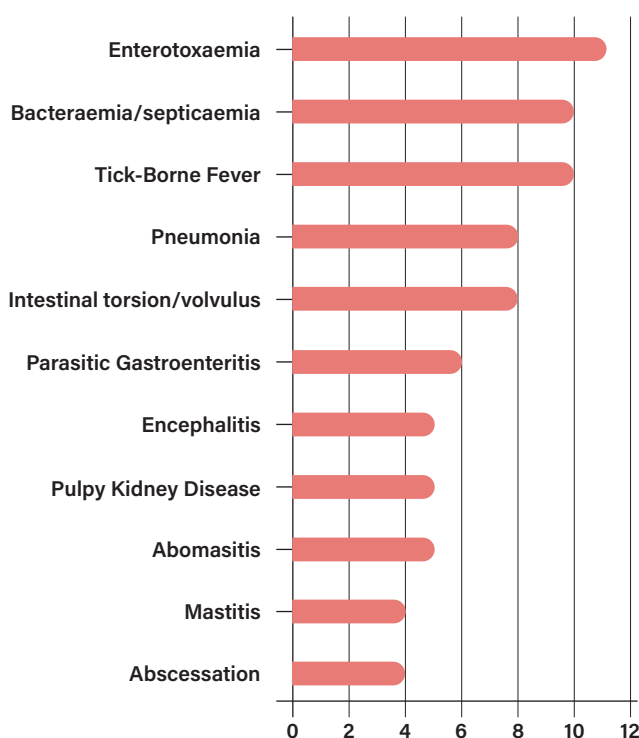


Table 2: The most common diagnoses in sheep submitted for necropsy in May 2024.

Gastrointestinal Tract

Ruminal acidosis/embolic pneumonia

Sligo RVL examined the carcase of a three-year-old ram which had been reported off-form for the weeks prior to death with rapid deterioration despite treatment efforts. On post-mortem examination, there was large bilateral abscessation of the lungs affecting approximately 70 per cent of the lungs. The ruminal mucosa did not slough and was fibrosed which is highly suggestive of chronic ruminal acidosis. Bacterial culture was not successful in this case and might have been affected by ante-mortem antimicrobial treatment. This ram had severe lung abscessation and respiratory function was severely compromised. The findings in the rumen indicate previous acidosis that may have caused embolic showering of the lungs, setting up abscesses.

Nervous System

Spinal abscessation

A lamb was submitted to Kilkenny RVL with a history of hindlimb paralysis and a query of swayback. On examination, there was abscessation/purulent material multifocally along the spinal cord. *Trueperella pyogenes* and *Pseudomonas* sp. were cultured. Tests for tick-borne fever were negative. Copper was within normal limits.



Figure 25: Spinal abscessation in a lamb. Photo: Aideen Kennedy.

There was also a separate submission from a different farm of a two-week-old lamb with suspect meningitis. On examination, there was fibrin in the atlanto-occipital joint. No significant agent was identified on culture but there had been a history of recent antibiotic use. Spinal abscesses causing spinal cord compression are common in sheep, often in lambs aged between one and three months old. Vertebral abscesses often occur as a sequel to an infection elsewhere but macroscopically visible evidence of localised infection of another organ system is not common. Iatrogenic lesions caused by dosing gun injuries or intramuscular injections of irritating substances may give rise to lesions that track to the cervical spine.

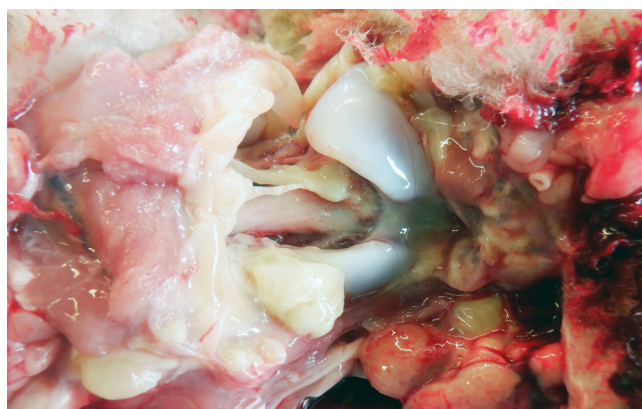


Figure 26: Fibrinous reaction at the atlanto-occipital joint. Photo: Aideen Kennedy.

Miscellaneous

Tick-borne fever

A two-day-old lamb which had been found dead was submitted to Sligo RVL. On gross post-mortem examination, severe dehydration and depletion of fat depots were noted. There were locally extensive oral and pharyngeal abscesses. *T. pyogenes* was isolated from the lesions. DNA specific to *Anaplasma phagocytophilum* was detected systemically by PCR technique. Tick-borne fever with secondary bacterial infections was diagnosed as cause of death.