

REGIONAL VETERINARY LABORATORIES REPORT

February 2024

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 647 carcasses and 391 fetuses during February 2024. Additionally, 1,782 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 February 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 presentations 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 February 2024.

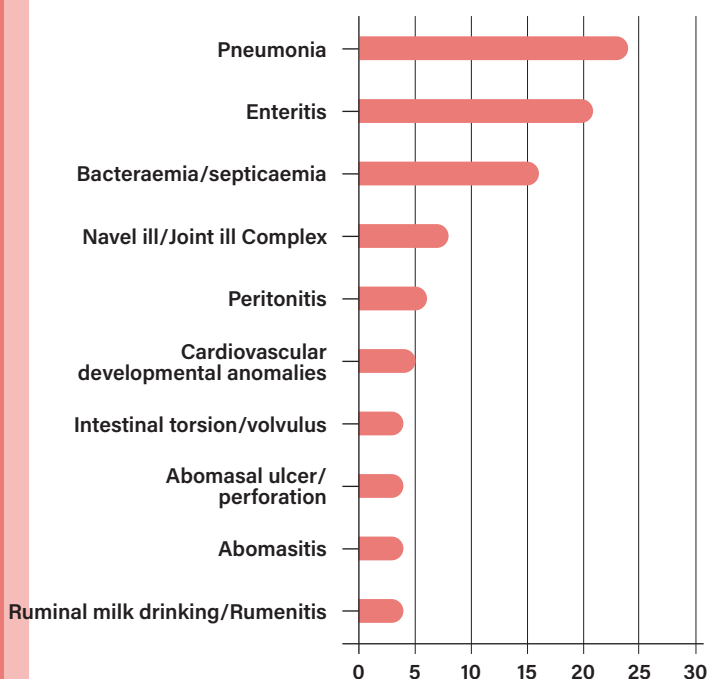


Table 1: The most common diagnoses in cattle submitted for necropsy in February 2024.

Gastrointestinal Tract

Atresia jejuni

Athlone RVL examined a neonatal calf submitted having died six hours after birth with pronounced distension of the abdominal cavity. Upon necropsy, there was voluminous distension of the proximal intestinal tract with evidence of jejunal atresia. The proximal section culminated in a blind end with no luminal continuation to the distal section.

Atresia describes a developmental malformation with occlusion of the intestinal lumen and has been described in particular for the jejunum, ileum, rectum or anus. There are different types of atresia, e.g., stenosis, membrane atresia, or cord atresia. Occasionally, multiple sites of the intestine can be involved. The causes of atresia development are not fully understood but an

ischaemic insult (likely mechanical) to the blood vessels of the affected portion of the gut or aseptic peritonitis have been discussed as potential causes. Atresia of the intestine is reported across all domestic species.



Figure 1: Atresia jejuni in a calf. Dilated proximal intestines are seen to the right of the arrow, distal intestines to the left. Photo: Aoife Coleman.

Respiratory Tract

Pneumonia

A two-year-old heifer was found displaying agonal signs which were treated, but died shortly afterwards, and was submitted to Kilkenny RVL. This was the second case in a week. On examination, there was a fibrinous pericarditis with adhesions to the pleura. There was a marked fibrinous pleuritis and pneumonia. Approximately 70 per cent of the lungs were consolidated, there was fibrin distending the interlobular septae and caudally the lungs were overinflated. *Mannheimia haemolytica* was cultured from multiple organs. Reports of acute pleuropneumonia in dairy cows, associated with *M. haemolytica*, have increased in Europe in the last number of years (Bisheuval et al, 2021).



Figure 2: Fibrinous pleuritis and pneumonia. Photo: Aideen Kennedy.

Sligo RVL examined the carcass of a six-week-old calf which had been found dead without any prior sign of sickness. On necropsy, there were several small-sized (<0.5cm) abscesses in the left cranial lung lobe. There was chronic pleuritis. The cranio-ventral lobe of the right lung was consolidated with multifocal areas of haemorrhage and necrosis. Clotted blood was present in the trachea. Petechiae were present throughout the peritoneum and pleura. On histopathology, there was diffuse, acute, severe purulent pneumonia. Bronchi, bronchioli and focally extensive alveolae were filled with neutrophilic debris. The liver presented with mild suppurative inflammatory portal infiltration. *M. haemolytica* was detected in lung tissue. Bacterial pneumonia and likely bacteraemia were diagnosed as the cause of death.

Cardiovascular System

Uterine artery rupture

A cow was submitted to Kilkenny RVL, having been found dead with no previously observed signs. On examination of the abdominal cavity, there was a large blood clot in the pelvic abdomen with a large volume of haemorrhage in the region of the uterine artery. Catastrophic abdominal arterial aneurysm and rupture occurs sporadically in dairy cattle and is most often reported in Holstein/Friesian cows around four to five years of age.

Lesions, when identified, are most often found in the abdominal aorta, coeliac artery, cranial mesenteric artery, or uterine arteries. Animals are usually found dead; if found alive, animals display sudden milk drop, recumbency, colic and death. The cause of this condition is unknown. Local vasculitis secondary to bacterial, fungal, or parasitic infection, trauma, and hereditary defects have all been hypothesised.

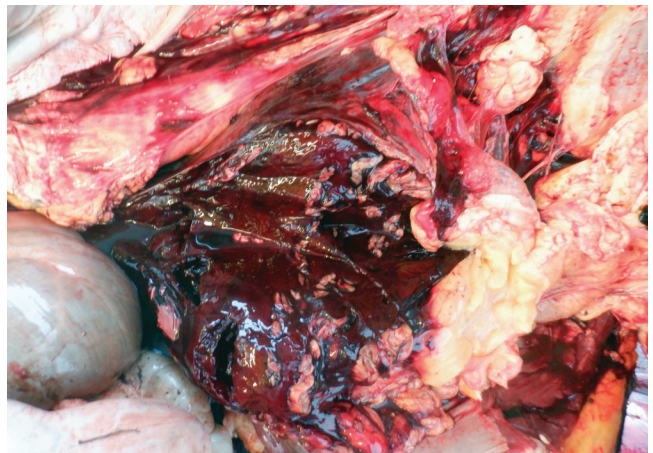


Figure 3: Uterine artery rupture. Photo: Aideen Kennedy.

Vena Cava Thrombosis

The carcass of a two-year-old heifer with a history of sudden death was submitted to Sligo RVL. On post-mortem examination, the carcass was noted to be severely anaemic and dehydrated. The reticulo-rumen contained a large quantity of frank clotted blood which had been swallowed as a result of a ruptured pulmonary vessel that caused haemorrhage into pulmonary airways. The likely cause of the rupture was damage to a vessel wall following embolic pneumonia. This may occur following rumen acidosis and a septic embolic shower.

Nervous System

Necrotising ventriculitis

A ten-month-old Friesian heifer was submitted to Limerick RVL after displaying no response to treatment for meningitis. The animal had been housed for two or three months on silage. There was no evidence of lead or poisonous plants in the rumen and no evidence of fluorescence of brain tissue under Wood's Lamp examination. Cross-section of the brain revealed dilation of the lateral ventricles, and histopathology revealed a necrotising ventriculitis (inflammation of ependymal lining of ventricles), likely bacterial in origin, with a secondary meningoencephalitis.



Figure 4: Dilation of the lateral ventricles in a case of ventriculitis and meningitis. Photo: Brian Toland.

Musculoskeletal

Blackleg

Sligo RVL diagnosed blackleg in a housed, eight-month-old weanling. The animal had been found dead suddenly after presenting with lameness on the evening before. It had been transported from a different premises in the days prior to death. On post-mortem examination, there was extensive necrotising myositis on the left side of its neck and thorax. There were concurrent mild acute pneumonia and acute pleuritis. *Clostridium chauvoei* was detected by fluorescent antibody technique (FAT) in the muscular lesion. *Pasteurella multocida* was detected in the lung.

Poisonings



Figure 5: Abomasal oedema in a case of ragwort (*Jacobaea vulgaris*) poisoning. Photo: Alan Johnson.

Ragwort poisoning

An 11-month-old Hereford weanling was submitted to Limerick from a dairy and calf-to-beef enterprise. In total, 95 animals were in the affected group which was housed and fed on baled silage. This was the fourth animal to die over a four-week period. The clinical signs reported were weakness, blindness, frothing from the mouth, and tenesmus. On post-mortem examination, there was widespread oedema throughout the body with particularly severe oedema of the abomasal mucosa. The liver was firm, pale, and shrunken. No significant bacterial pathogens were isolated on culture. Histopathology revealed lesions of diffuse fibrosis, bile duct proliferation and megalocytosis. The findings were consistent with a chronic toxic hepatopathy, and pyrrolizidine alkaloid poisoning due to ragwort (*Jacobaea vulgaris*) consumption was suspected to be the cause. A review and change of the silage diet was recommended.

Miscellaneous



Figure 6: Variably sized pale hepatic lesions in a case of listeriosis (septicaemia). Photo: Brian Toland.

Listeriosis (septicaemia)

A ten-day-old Friesian heifer was submitted to Limerick RVL, the calf had presented with a very high temperature and there was no response to treatment. Post-mortem examination revealed multiple blood clots up to 80cm in length in the intestines, there were multiple white spots of different sizes on the surface and in the body of the liver, the spleen was enlarged with multifocal haemorrhages on its surface, and skeletal muscles and lungs were very pale in colour. The rumen contained a fistful-sized quantity of wood chip. *Listeria monocytogenes* was cultured from the liver, lung and spleen. A zinc sulphate turbidity test (ZST) result of 10 units was interpreted as inadequate and implied that colostrum feeding had not been successful. A diagnosis of *L. monocytogenes* septicaemia and failure of passive transfer was made. Listeriosis can result in clinical signs within two days of ingestion. Subsequent septicaemia can lead to the development of small necrotic foci in organs, particularly the liver (as seen in this case). The severe haemorrhage observed in this case was likely due to disseminated intravascular coagulation as a complication of the septicaemia. Immunosuppression, concurrent disease, level of challenge, nutrition, and stress have all been proposed as potentially influencing the likelihood of clinical signs being seen.



Figure 7: An intestinal blood clot in a case of Listeriosis (septicaemia). Photo: Brian Toland.

Sheep

Bacteraemia/septicaemia and fasciolosis were the most common diagnoses at necropsy in sheep in the RVLs during February 2024.

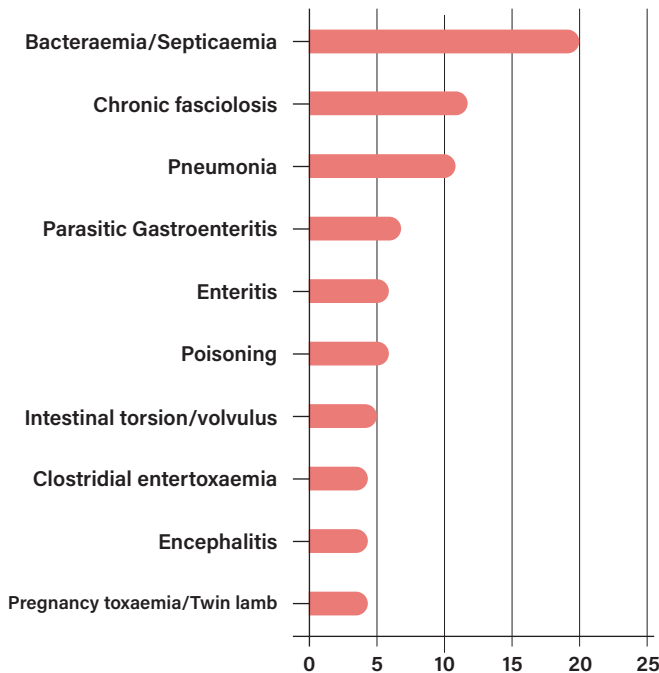


Table 2: The most common diagnoses in sheep submitted for necropsy in February 2024.

Gastrointestinal Tract

Clostridial abomasitis

A ten-month-old hogget was found dead and submitted to Kilkenny RVL. There had been two more sudden deaths in the previous week. On necropsy, the abomasal mucosa was very inflamed, blackened, and there was multifocal emphysema. *Clostridium septicum* FAT results were positive. Ingestion of frozen herbage can lead to devitalisation of abomasal tissue at the point of contact of that organ with the rumen allowing invasion of *C. septicum*. It may cause rapid death without signs or may cause fever, anorexia, and depression. Use of a multivalent clostridial vaccine was recommended.



Figure 8: Abomasitis in a sheep from which *Clostridium septicum* was identified. Photo: Aideen Kennedy.

Fasciolosis

A two-year-old Suffolk-cross ewe – which had given birth to a single lamb three weeks previously, had been off form since then, and was terminally inappetent with no milk – was submitted to Limerick RVL. At necropsy, external examination revealed very pale mucous membranes. Internally, there was severe liver damage with haemorrhage, and numerous adult fluke present in the liver and gall bladder. Chronic-active fasciolosis was diagnosed. There was also a concurrent heavy roundworm burden and rumen fluke eggs were also detected. Very low hepatic copper concentrations were detected which can accompany an increased incidence of parasitism.

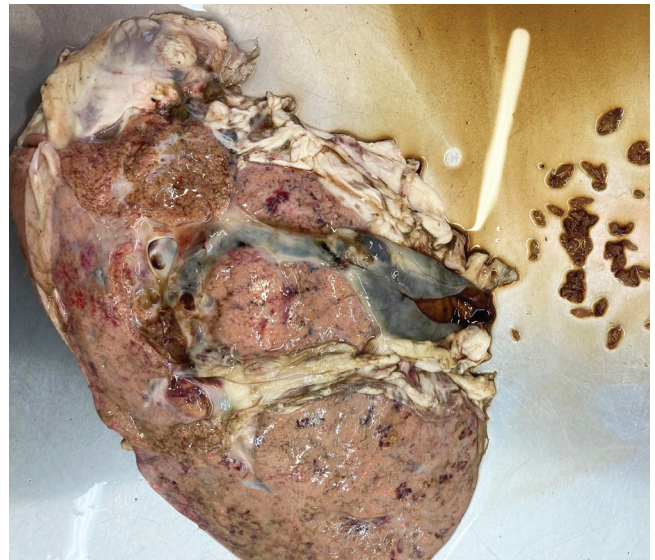


Figure 9: Haemorrhagic tracts in the liver and adult *Fasciola hepatica* which had been found in the gall bladder. Photo: Brian Toland.

Enterotoxaemia

Athlone RVL examined a five-week-old lamb with a history provided of sudden death. The lamb was in excellent condition and well-preserved. Within the pericardial sac, there was a large fibrinous clot and, on mid-sagittal examination of the brain, there was pronounced coning of the caudal cerebellum. There were multiple petechiae across kidney cortices, spleen and epicardium. Urinalysis disclosed a glucosuria and the epsilon toxin of *Clostridium perfringens* was detected by enzyme-linked immunosorbent assay (ELISA).

Upon examination of the brain by histopathology, there was multifocal perivascular oedema (microangiopathy) surrounding blood vessels (Virchow-Robin space). Further, there was multifocal oedematous expansion of the meninges with an infiltrate of rare lymphocytes, plasma cells and multifocal areas of haemorrhage. A diagnosis of clostridial enterotoxaemia (pulpy kidney disease) was assigned. It is caused by the anaerobic bacterium *C. perfringens* type D, which is normally found in the soil and as part of the normal microflora in the gastrointestinal tract of healthy sheep and goats. Proliferation in the intestinal contents of this bacteria releases epsilon toxin which can cause sudden death. Advice issued included vaccination with multivalent clostridial vaccine (containing clostridial toxoids) and avoiding overeating or the overfeeding of starch-rich diets.

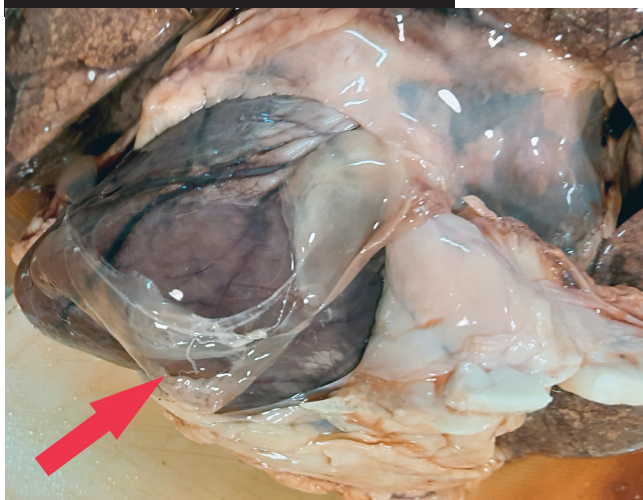


Figure 10: A fibrinous clot in the pericardial sac in a case of clostridial enterotoxaemia. Photo: Aoife Coleman.

Clostridial enterotoxaemia is a frequent diagnosis in sheep in Sligo RVL. In one case, two eight-week-old lambs were submitted for post-mortem with a history of sudden death. In this case, the intestines presented with very thin walls due to enteritis. There was severe cerebellar coning, a sign often observed in cases of enterotoxaemia caused by the epsilon toxin of *C. perfringens*.



Figure 11: Cerebellar coning (arrow) in a lamb with clostridial enterotoxaemia. Photo: Shane McGettrick.

Johne's disease

A three-year-old ewe in very poor body condition, dehydrated, and with severe perineal faecal staining was submitted to Dublin RVL for necropsy within the Thin Ewe Survey. The animal had severe depletion of visceral adipose depots, severe diffuse lymphangiectasia within the distal segments of jejunum, ileum, caecum, and colon, and scattered small (1mm) white-yellow foci within the lymphatic vessels. Intestinal segments were diffusely severely thickened, and after opening these, they showed corrugation, yellow-pigmentation, multifocal moderate-sized petechiae (especially within the caecum), and diarrhoeic contents. The regional lymph nodes were severely diffusely oedematous and reactive.

Histologically, a severe granulomatous enteritis (acid-fast bacteria were observed using a Ziehl-Neelsen stain) indicative of Johne's disease was observed. The animal had

gross and histological lesions indicative of Johne's disease, in addition it tested serologically positive for *Mycobacterium avium* sub. *paratuberculosis* (MAP), the causal agent of this disease.



Figure 12: Thickened intestinal walls with corrugated pigmented mucosa upon opening the lumen (arrow). Photo: Sebastian Alessandro Mignacca.

Atresia jejuni

Sligo RVL examined the carcass of a two-hour-old lamb which had died after dystocia caused by a distended abdomen. The lamb lived for two hours and was able to suckle colostrum before death. It was one of a pair of twins, but no issues were observed with the other twin. On post-mortem examination, an atresia jejuni was discovered in the mid-jejunum.

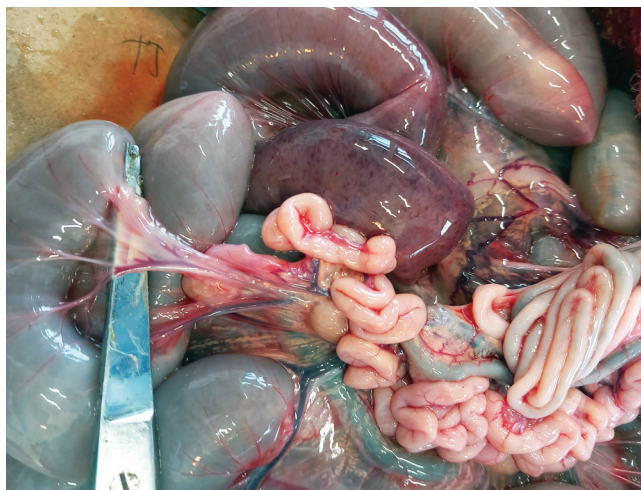


Figure 13: Atresia jejuni in a lamb. Dilated proximal intestines are seen to the left of the scissors, distal intestines to the right. Photo: Rebecca Froehlich-Kelly.

Respiratory Tract

Pneumonia

An 11-month-old ram deteriorated rapidly over a two-week period, died, and was submitted to Kilkenny RVL. On necropsy, there was pneumonia. Approximately 60 per cent of the left lung and approximately 10 per cent of the right lung were consolidated. Histopathology indicated a suppurative pneumonia and extensive lung fibrosis. *Bibersteinia trehalosi* was cultured and polymerase chain reaction (PCR) tests for *Mycoplasma ovipneumoniae* were positive. *M. ovipneumoniae* alone can cause a mild

bronchopneumonia; however, it is often isolated along with *M. haemolytica* from sheep and goats with severe pneumonia, suggesting that *Mycoplasma* may predispose the lung to invasion by Pasteurellaceae.



Figure 14: Cranio-ventrally distributed pneumonia in a hogget. Photo: Aideen Kennedy.

Ovine pulmonary adenocarcinoma

A two-year-old hogget with a history of lameness and a copious nasal discharge was submitted to Sligo RVL. On post-mortem examination, there was bilateral necro-haemorrhagic anteroventral pneumonia. There was bilateral multifocal pulmonary neoplasia consistent with adenocarcinomatous change. *M. haemolytica* was isolated from the lesions. DNA specific to jaagsiekte sheep retrovirus was detected in the lesions by PCR technique.

Laryngeal chondritis

Sligo RVL diagnosed laryngeal chondritis ('Texel throat') in an adult Texel ewe. The animal had been noticed dull and been treated with antimicrobials but died despite treatment efforts. On post-mortem examination, there was a large abscess in the right arytenoid cartilage. *Streptococcus* sp. was cultured from the purulent material.

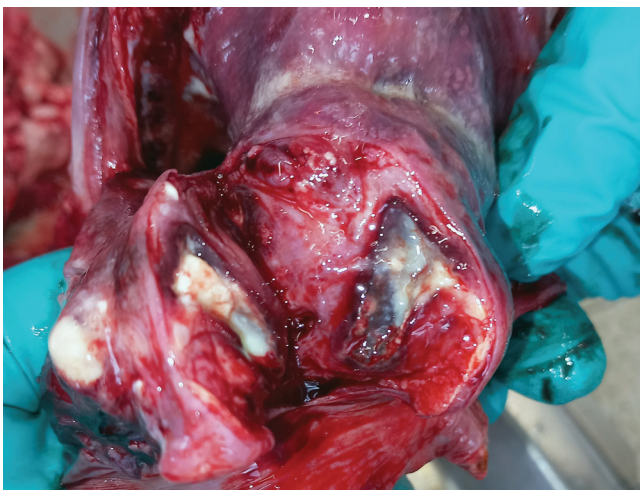


Figure 15: Laryngeal chondritis in a Texel ewe. Photo: Rebecca Froehlich-Kelly.

Urinary/Reproductive Tract

Schmallenberg virus

Deformed ovine foetuses from multiple flocks were submitted to Kilkenny RVL. PCR positive results for Schmallenberg virus (SBV) were recorded. Bluetongue virus and pestivirus tests were negative. In non-pregnant adults infected with SBV the clinical signs may include fever, anorexia, reduced milk yield, sometimes diarrhoea. The acute disease is self-limiting and often mild. Affected animals recover fully within days from the acute infection. If naïve ruminant animals are infected during the early stages of pregnancy they may subsequently abort or give birth to malformed offspring. Signs seen include: bent limbs and fixed joints (arthrogryposis), stiff necks (torticollis), curved spines (scoliosis), shortened lower jaw (brachygnathia, pictured), and hydranencephaly often with doming of the skull.



Figure 16: Brachygnathia in a lamb from which Schmallenberg virus was isolated. Photo: Aideen Kennedy.

Enzootic abortion of ewes

Three ovine foetuses were submitted to Dublin RVL from a flock where there had been approximately 10 abortions from 400 ewes. The ewes were mostly bought-in to the flock. All had been vaccinated against clostridial disease and pasteurellosis. There were no gross lesions observed on all the three foetuses. The placenta of the first lamb showed a diffuse haemorrhage, with mild creamy discolouration and exudate on the cotyledons and in the intercotyledonary areas. Only one placenta was submitted. There was a strong PCR positive result for *Chlamydia abortus*, the causative organism of enzootic abortion of ewes (EAE). Histopathology revealed a multifocal-to-coalescing, moderate-to-severe necro-suppurative placentitis with vasculitis, lesions consistent with EAE abortion. *C. abortus* can cause abortion storms/outbreaks in naïve flocks. Review of *C. abortus* control programme was recommended. The source of infection with *C. abortus* is aborting ewes at time of abortion, and through vaginal discharge for three weeks post-partum. It is advisable to isolate affected sheep for at least three weeks, destroy placentae, and disinfect pens. Keep pregnant ewes away from infected pens and don't use aborted ewes to foster replacement ewe lambs. *C. abortus* is a zoonosis, and a particular risk to immunocompromised or pregnant humans.



Figure 17: Placentitis in a case of enzootic abortions of ewes (EAE). Photo: Sara Salgado.

Poisonings

Copper poisoning

Sligo RVL diagnosed copper poisoning in sheep on one holding. Several carcasses and serum samples were submitted. The histories of the submitted sheep included anorexia, dullness, staring and weakness. On post-mortem examination, all of the cases presented with jaundice and dark (gunmetal-coloured) kidneys. One animal presented with haemoglobinuria. Hepatic and renal copper concentrations ranged from the high end of the reference range to very elevated. Serum copper concentrations were also elevated in two out of three samples tested.

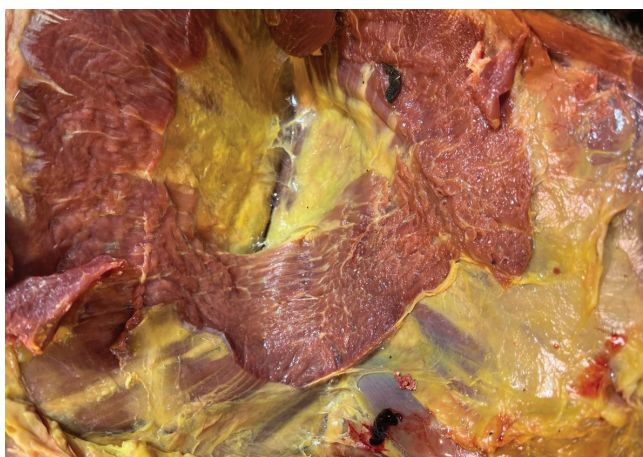


Figure 18: The jaundiced carcass of a sheep with copper poisoning. Photo: Aoife Coleman.

Athlone RVL has investigated several cases of copper toxicity in hoggets and adult ewes. Gross examination of these animals included the following findings: markedly jaundiced carcass, bilateral dark black (gunmetal) kidneys, jaundiced liver, dark urine with petechiae across the carcass. Evaluation of copper concentrations in kidney and liver disclosed values ranging from 0.6mmol/kg to 0.8mmol/kg (reference range 0.06-0.18mmol/kg) with liver copper levels reaching 4.72mmol/kg with reference range of 0.06-2.50mmol/kg. In some of these cases, minerals manufactured for cattle had been used to supplement the diet of sheep; these products contain significantly more copper than those formulated for feeding to sheep. This includes loose mineral and salt/mineral blocks.



Figure 19: Gunmetal-coloured kidney in a sheep with copper poisoning. Photo: Aoife Coleman.

Sheep are generally more susceptible to copper poisoning than other farm animals. Certain breeds are more susceptible. Copper intoxication commonly occurs if supplements or meal not developed for sheep are fed, e.g., if bovine concentrates are used for feeding sheep as they may contain increased copper supplements. However, other sources of copper, or liver impairment in animals which had been previously exposed to higher dietary copper, must be considered as well. Once a certain threshold of copper is reached in the liver cells, they can no longer function and begin to fail, releasing large amounts of copper into the circulation. Stressful events, such as lambing, severe weather changes, poor nutrition, transportation, or shearing, may precipitate this event. Sudden release of large amounts of copper into the blood causes a haemolytic crisis. Clinical signs can include: the acute onset of depression, anaemia, dehydration, bruxism, and jaundice. The urine is a typically dark deep 'red wine' colour.

Miscellaneous

Neoplasia

Sligo RVL received a four-year-old ewe which had been 'failing' (suffering from ill-thrift) over the previous months. On post-mortem examination, there were reduced internal fat depots. Mesenteric lymph nodes were notably enlarged. The intestinal walls were segmentally thickened and occasionally trapped in a soft white mass, the adjacent mesentery presented pale and thickened.

On histopathology, normal structures were effaced by uniform sheets of discrete round cells with anisocytosis, anisokaryosis, and bizarre mitotic figures throughout. An invasive round cell tumour, likely a lymphoma or lymphosarcoma causing intestinal dysfunction was diagnosed as the cause of death. Intestinal lymphomas are a rare finding in sheep. Malignant intestinal adenocarcinomas are relatively more frequent.



Figure 20: Thickened intestines surrounded by neoplastic tissue in a case of intestinal neoplasia in a ewe with ill thrift. Photo: Rebecca Froehlich-Kelly.