

REGIONAL VETERINARY LABORATORIES REPORT

January 2024

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 462 carcasses and 473 fetuses during January 2024. Additionally, 1,226 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 January 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 January 2024.

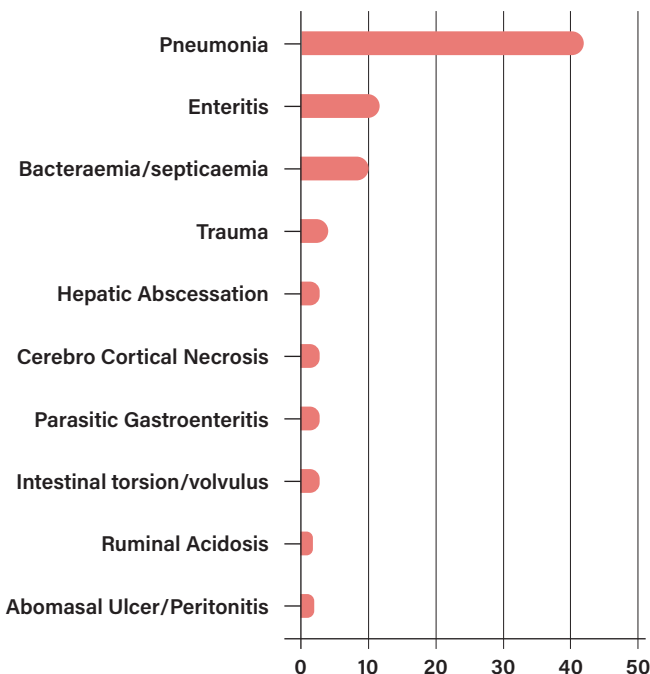


Table 1: The most common diagnoses in cattle submitted for necropsy in January 2024.

Gastrointestinal Tract

Abomasitis and abomasal ulceration

A number of two- and three-week-old calves have been submitted to Kilkenny RVL with abomasal ulceration. Such calves frequently have sub-optimal zinc sulphate turbidity (ZST) levels indicating inadequate transfer of colostral immunity, and testing of intestinal contents can be rotavirus and *Cryptosporidium* positive. A review of colostrum feeding, and control of these agents on affected units is recommended. There have been a number of cases of abomasal bloat from which *Sarcina* sp. have been detected. Advice to control some known risk factors (see panel) is given in cases of abomasal bloat.

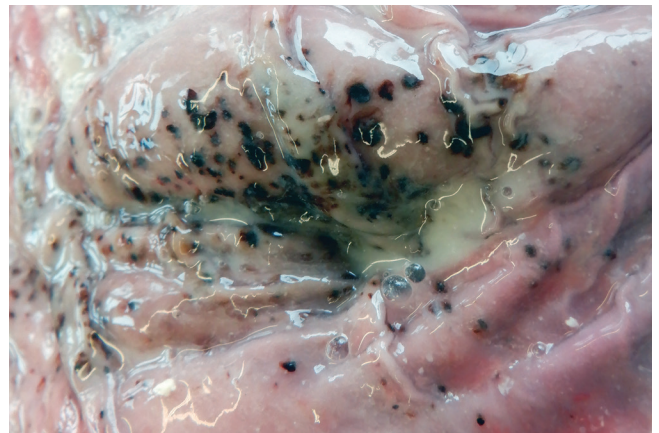


Figure 1: Abomasal ulceration. Photo: Maresa Sheehan.

Abomasitis and abomasal bloat

Contributory factors to this bloating include:

1. Contaminated colostrum and/or milk
2. Improperly mixed milk replacer
3. Free water availability problems
4. Improperly mixed electrolytes
5. Excessive oral supplements, probiotics, and antibiotics
6. Erratic feeding schedules (for example at 9am and 4pm), leading to overfeeding and engorgement.

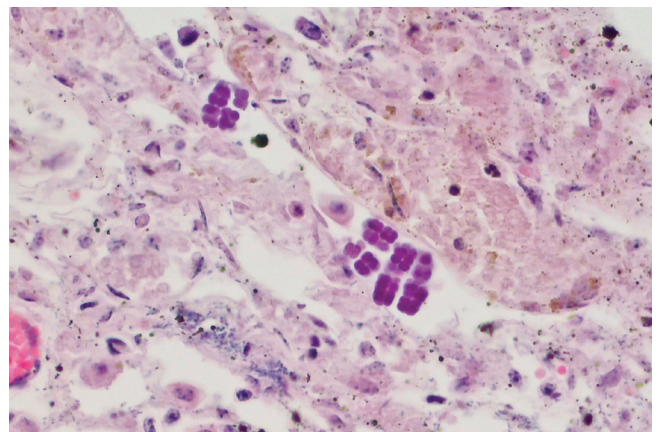


Figure 2: *Sarcina* sp. bacteria in characteristic tetrad morphology. Photo: Maresa Sheehan.

Neonatal enteritis

Athlone RVL examined a perinatal calf that lived for less than 48 hours. It had a normal delivery, and the calf had

suckled but developed diarrhoea the next morning and died soon after. It was the second similar loss. On gross post-mortem examination, there was milk in the abomasum, loose mustard-like intestinal contents and faeces, and the lungs were inflated. The umbilicus and joints were unremarkable and there was no evidence of trauma or dystocia.

Escherichia coli K99 was detected in faeces. ZST result was five units, and this may indicate a failure of passive transfer. Histopathology of the lung showed evidence of sepsis. A conclusion of *E. coli* K99 enteritis, hypogammaglobulinaemia and sepsis was reached.

Omphalitis and Peritonitis

A three-week-old calf was submitted to Kilkenny RVL, it had been noticed unwell the night before. On examination, there was multifocal fibrinous peritonitis. There was a purulent abscess at the umbilicus (omphalitis/navel ill). *Streptococcus* sp. was cultured from multiple organs indicating a bacteraemia. A review of umbilical hygiene at calving was recommended.



Figure 3: Purulent umbilical infection (omphalitis). Photo: Aideen Kennedy.

Athlone RVL examined a week-old calf that had been born healthy without a difficult calving, found dull and dehydrated and died quickly. There was marked bilateral enophthalmos, suggesting dehydration. The umbilicus was enlarged and was necrotic and suppurative on cross-section. There was a diffuse fibrinous peritonitis. The joints were unremarkable. The ZST result of 23 units indicated adequate colostral immunity. A conclusion of omphalitis and peritonitis was made.

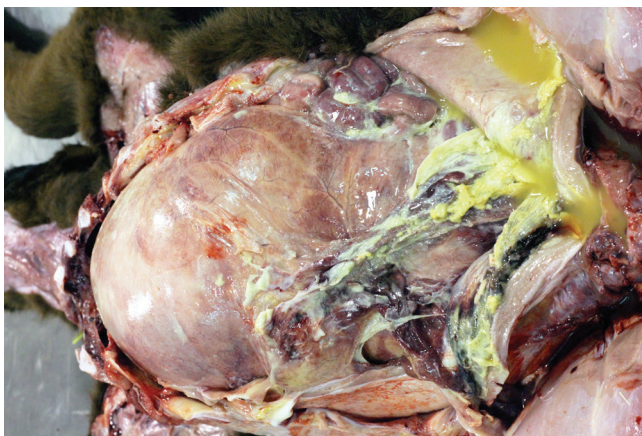


Figure 4: Fibrinous peritonitis. Photo: Rebecca Froehlich-Kelly.

Jejunal haemorrhagic syndrome

A four-year-old cow was submitted to Kilkenny RVL. The cow was sick for a day and had stopped eating. On necropsy, there was a firm blood clot in the small intestine approximately 1m to 2m long. The intestinal contents cranial and caudal to the clot were very liquid. No significant agents were identified in laboratory tests and a diagnosis of jejunal haemorrhage syndrome was made. Jejunal haemorrhagic syndrome (JHS) has been reported in both beef and dairy cows. The disease occurs sporadically. Mechanical obstruction of varying lengths of jejunum with clotted blood is characteristic. The aetiology is unknown. A history of sudden death, or of decreased milk production, anorexia, abdominal discomfort, melena, and distended loops of intestines on rectal examination has been reported. Treatment is not reported to be successful, and the prognosis for affected cows is very poor. A recent study concluded that there was no association with infectious disease, including clostridial enterotoxaemia which was initially suspected to be the cause.



Figure 5: Intestinal loops distended by blood clot (bottom) in jejunal haemorrhagic syndrome. Photo: Aideen Kennedy.

Respiratory Tract

Aspiration pneumonia

A less than 24-hour-old calf was presented to Kilkenny RVL with a history of being slow to suckle and as a consequence had been fed colostrum by stomach tube. On necropsy, there was a mild pericardial effusion, and the lungs were congested. Culture of the liver and lungs yielded no significant findings. On histopathology, diffusely the airways contained amorphous basophilic material with occasional globules of darker staining material, which is consistent with the histological appearance of milk. A diagnosis of suspected aspiration pneumonia was made; care and revised technique when using a stomach tube was advised.

Pneumonia

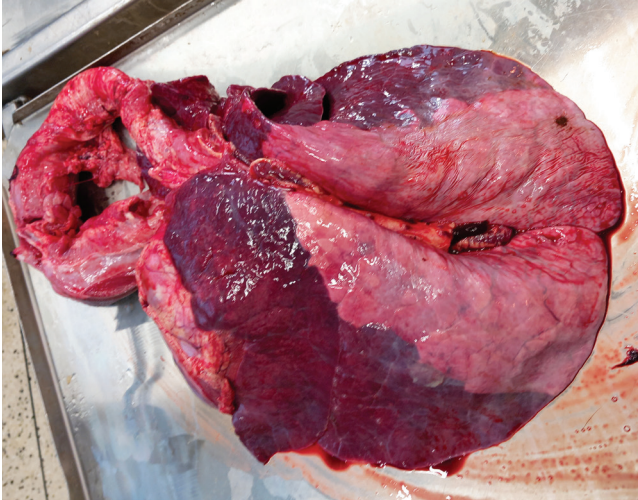


Figure 6: Ventral pulmonary consolidation in a case of pneumonia caused by *Histophilus somni*. A clear demarcation between affected and normal lung is visible. Photo: Rebecca Froehlich-Kelly.

Sligo RVL examined a two-week-old calf which had been found dead unexpectedly. On necropsy, there was cranio-ventral consolidation of the lung affecting all lobes. Approximately 80 per cent of the lung parenchyma was affected. On histopathology, there was diffuse, acute, necro-purulent bronchopneumonia with neutrophils and neutrophilic debris present in bronchi and alveolae. There was mild interstitial inflammatory infiltration. *Histophilus somni* was detected in the lesion.

Pleuritis and pericarditis



Figure 7: Fibrous adhesions in a case of pleuritis in a calf. Photo: Rebecca Froehlich-Kelly.

Sligo RVL examined a three-week-old calf which had been noticed to be unwell the previous day, treated and apparently improved, but was then found dead in the morning. On post-mortem examination, there was severe, chronic pleuritis and pericarditis. There was also mild peritonitis in the cranial abdominal cavity. Bovine respiratory syncytial virus (BRSV) as well as *Mannheimia haemolytica* and *Pasteurella multocida* were detected in the lung by polymerase chain reaction (PCR). Pericarditis and pleuritis were diagnosed as the most likely cause of death.



Figure 8: Pericarditis in a calf. Photo: Rebecca Froehlich-Kelly.

Urinary/Reproductive Tract

Cystitis

Limerick RVL examined a three-year-old dry, pregnant Friesian cow with a short history of depression, inappetence and haematuria. The cow was treated but continued to deteriorate and died within 24 hours. On gross post-mortem examination, there was severe, diffuse, haemorrhagic cystitis and abomasitis. There were ecchymotic haemorrhages in the epicardium, intestinal serosa, spleen and liver surfaces. The lungs were pale. On histopathology, there was evidence of multifocal fibrino-haemorrhagic and neutrophilic mural cystitis and multifocal fibrino-haemorrhagic and neutrophilic interstitial myocarditis. It was considered that the changes in the bladder and heart were indicative of acute inflammatory disease, the cause of which was not evident.



Figure 9: Haemorrhagic cystitis in a cow showing the interior surface of the bladder. Photo: Alan Johnson.

Abdominal haemorrhage

A five-year-old cow, in advanced pregnancy, was presented to Kilkenny RVL with a history of sudden death. On post-mortem examination, the mucous membranes were pale. There was a large blood clot in the abdomen and the source of the haemorrhage was identified as the uterine vessels. Rupture of abdominal arteries in cattle appears to be sporadic. The common presentation is sudden death of a single animal. The cause is unknown, but age appears to be a factor in the development of disease, with affected cattle ranging in age from 2.5 to 5.5 years.

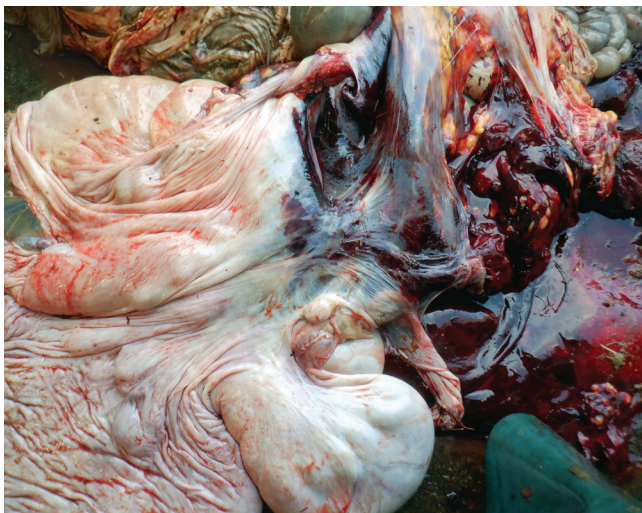


Figure 10: Ruptured uterine artery. Photo: Lisa Buckley.

Trauma

Sligo RVL examined a four-year-old cow which had been noticed to be unwell, with a malodorous vaginal discharge after a difficult assisted calving. On post-mortem examination, there was extensive abdominal haemorrhage with significant haemorrhagic, fibrinous, purulent peritonitis. There was an approximately 5cm-sized tear on the dorsal corpus uteri with associated haemorrhage (clots) and fibrous adhesions. Several haematomas and friable foci were present on the uterine corpus. Trauma, likely to have occurred during the calving, with subsequent sepsis, was diagnosed as cause of death.

Cardiovascular System

Cardiac abscessations

A yearling heifer in good body condition with no record of previous signs, which had been bought in 10 days previously, was submitted to Dublin RVL with a history of sudden death. The lungs were diffusely moderately congested and heavy, with reactive mediastinal lymph nodes. Bilaterally, within the caudal pulmonary lobes, there were also scattered subpleural small (1mm x 3mm x 5mm), oval, flat, pale, firm plaques. The heart showed two discrete, well-encapsulated abscesses within the myocardium, one (3cm x 3cm x 4cm) within the apex and protruding towards the pericardial space, the other (3cm x 6cm x 8cm) within the interventricular septum; on cross-section, both were filled with large amount of yellow-cream purulent material. A diffuse moderate congestion was also noted. *Trueperella pyogenes* was isolated from the heart abscesses, and cardiac failure was most likely the cause of death in this

animal. *T. pyogenes* (formerly *Arcanobacterium pyogenes*) is present in the environment, and is a common inhabitant of the urogenital, gastrointestinal, and upper respiratory tracts of many animal species. It is recognised as the primary or secondary cause of a wide variety of pyogenic infections in ruminants. In cattle, it has been isolated from the ruminal wall and ruminal contents. The organism gains access to the body through contaminated abrasions, wounds or insect bites and the infection may remain localised in the form of a subcutaneous abscess with inflammation of the draining lymph node, or may proceed to a bacteraemia with internal localisation.

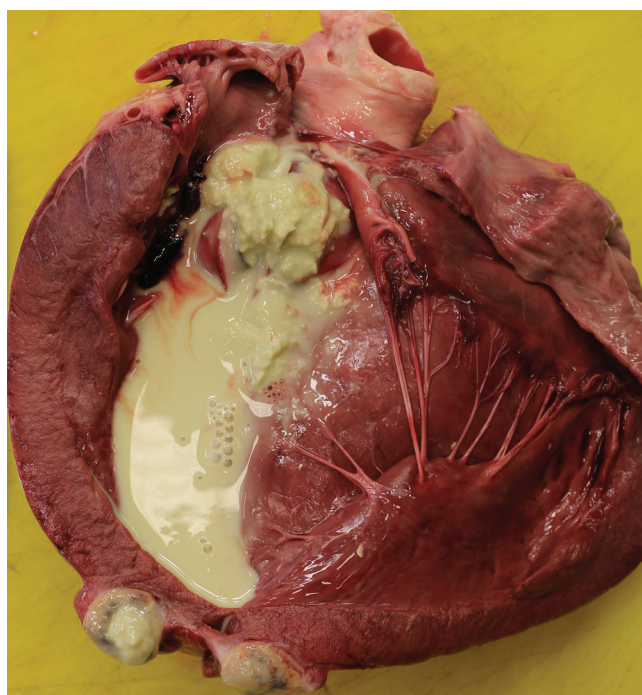


Figure 11: Pus from an incised myocardial abscess. Photo: Sebastian Mignacca.

Malignant catarrhal fever

Malignant catarrhal fever (MCF) was diagnosed as the cause of death of a 20-month-old heifer submitted to Sligo RVL. Before death, the animal was noted as weak, anorexic, and having diarrhoea. One eye appeared to be blind. There was some hypersalivation and hyperlacrimation. Sheep were present on a neighbouring farm. On necropsy, there was extensive degloving of the rostral lingual epithelium as well as oedema and necrosis of the rostral hard palate. There was bilateral endophthalmitis with fibrin strands visible in the aqueous humour. The lungs were heavy and wet with multifocal haemorrhage. There was hepatomegaly with moderate fibrosis and fluke present in the liver parenchyma. In the abomasum, there was multifocal, variably sized ulcers surrounded by necrotic and granulating rims. The small intestines presented with segmental diphtheritic membranes and sloughing of mucosa throughout. The caecum was oedematous and haemorrhagic. The presence of ovine herpesvirus 2, the causative organism of MCF, was confirmed by PCR; spleen is the preferred matrix for this test at necropsy. When this condition is suspected in a live animal, a whole blood sample using EDTA as an anticoagulant is required.



Figure 12: Endophthalmitis in a case of malignant catarrhal fever (MCF) in a heifer. Photo: Shane McGettrick.

Sheep

Acute and chronic fasciolosis, and pneumonia were the most common diagnoses at necropsy in sheep in the RVLs during January 2024.

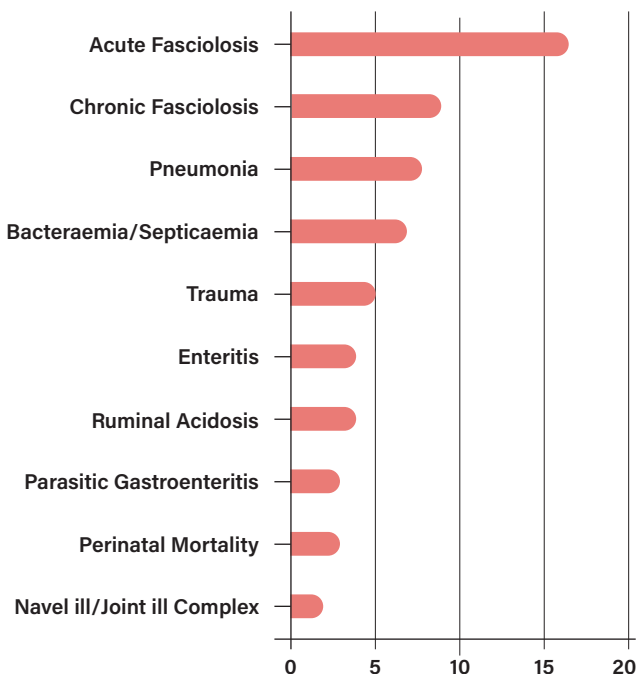


Table 2: The most common diagnoses in sheep submitted for necropsy in January 2024.

Gastrointestinal Tract

Clostridial enterotoxaemia

An eight-month-old lamb was found dead and submitted to Kilkenny RVL. On examination, the rumen contained a large volume of undigested grain. The lungs were oedematous and congested. Segments of the intestinal content were bloody. The urine was positive for glucose. The rumen pH was on the low end of normal. *Clostridium perfringens* epsilon toxin results were positive. *C. perfringens* type D is often associated with gorging on rich pasture or a high grain diet. Carry-over of partially digested food from the rumen to

the intestine leads to a large amount of undigested starch reaching the small intestine and allows rapid proliferation of *C. perfringens* and sustained production of epsilon toxin.



Figure 13: Glucosuria detected by a dipstick test (right). Photo: Aideen Kennedy.

Fasciolosis

Fasciolosis was diagnosed in submissions from multiple flocks in several RVLs.



Figure 14: Chronic/active fasciolosis, intestinal liver surface. Photo: Rebecca Froehlich-Kelly.

As in previous months, Sligo RVL saw several cases of chronic-active fasciolosis in sheep. In one case, two ewes were submitted after being found dead. Both ewes presented with similar findings. There were high numbers of adult fluke present in the gallbladder, as well as in the parenchyma. There was peritonitis as well as haemorrhage localised on the liver surface. There was ascites and pleural effusion. One of the ewes presented with hepatic abscessation.



Figure 15: Adult fluke present in gall bladder. Photo: Rebecca Froehlich-Kelly.

In another submission, a severe abdominal haemorrhage originating from the liver caused by fasciolosis was cause of death.



Figure 16: Abdominal haemorrhage due to chronic/active fasciolosis. Photo: Rebecca Froehlich-Kelly.

Athlone RVL continued to see multiple cases of both acute and chronic/active liver fluke in sheep. A three-year-old ewe was submitted with a history of having been sick for three weeks, anorexia, weight loss, and a lack of response to treatment. It was the sixth similar loss in four weeks. The carcass was pale and there was marked ascites. The liver was pale with haemorrhagic tracts diffusely throughout the parenchyma, as well as thickened fibrosed bile ducts and copious numbers of adult liver fluke in the bile ducts and gall bladder. Intestinal contents were loose and adult liver fluke were visible to the naked eye in the proximal small intestines, but the faeces was normal. A diagnosis of chronic active fasciolosis was made.



Figure 17: Cross section of a liver with chronic/active fasciolosis. Photo: Denise Murphy.

Limerick RVL examined two pregnant ewes that had been found dead in the shed. The ewes had been housed for two weeks and were last dosed for liver fluke (rafoxanide) and roundworms in November. On gross post-mortem examination, both ewes had extensive liver damage associated with severe fasciolosis. Some adult flukes were seen in the gall bladder. There was also hydrothorax and hydroperitoneum. An urgent review of the fluke control programme was recommended. Rafoxanide is active against *Fasciola hepatica* (mature and immature over eight weeks of age) but not the early immature stages.



Figure 18: Chronic/active fasciolosis, diaphragmatic liver surface. Photo: Alan Johnson.

Respiratory Tract

Caseous lymphadenitis and enterotoxaemia

Athlone RVL received a three-year-old ewe with a history of having looked "a little empty" the previous evening, seemed to have diarrhoea, and was found dead the next morning. It was the sixth recent loss. The tail and perineum showed faecal soiling. There were multifocal 1-2cm diameter abscesses throughout all lung lobes. The liver was enlarged and there was a 2-4mm abscess in the parenchyma. No liver fluke were seen. Intestinal contents and faeces were very loose and watery. *C. perfringens* epsilon toxin was

detected in intestinal contents. Epsilon toxin is indicative of *C. perfringens* type D enterotoxaemia. *Corynebacterium pseudotuberculosis* was isolated from the lung lesions. *C. pseudotuberculosis* is the causative agent of caseous lymphadenitis, an infectious disease that affects the lymphatic system, resulting in abscesses in the lymph nodes and internal organs. A conclusion of caseous lymphadenitis and *C. perfringens* type D enterotoxaemia or pulpy kidney disease was made.

Urinary/Reproductive Tract Pregnancy toxaemia



Figure 19: Uterus, containing three lamb fetuses, expanding, and occupying approximately 80 per cent of the abdominal cavity, in situ. Photo: Rebecca Froehlich-Kelly.

A four-year-old, pregnant ewe which had been initially lame, then anorexic but very thirsty, was submitted to Sligo RVL. Upon opening the abdomen, it was apparent that the very much enlarged uterus, containing three lambs, occupied approximately 80 per cent of the abdominal cavity. The rumen and the intestines were very compressed, and the rumen had only a small amount of content. The liver appeared distended with a lobular pattern. Histopathology of the liver revealed severe, diffuse hepatic lipidosis, most severely in periportal areas. Pregnancy toxaemia, also known as 'twin lamb disease', was diagnosed as the cause of death. A review of peripartum ewe management was advised. This ewe also had extensive internal fat depots which can predispose to pregnancy toxaemia. There was a light infection with enteric coccidia.



Figure 20: Uterus, containing three lamb fetuses, expanding, and occupying approximately 80 per cent of the abdominal cavity, deflected caudally for better visualisation. Photo: Rebecca Froehlich-Kelly.

Nervous System

Cerebral abscess

A two-year-old ewe was presented to Kilkenny RVL with a history of neurological signs prior to death. On post-mortem, the cerebral cortices were almost completely obliterated with pus. There was a small opening in the frontal bone adjacent to the lesion. Trauma to the skull was suspected with subsequent infection.



Figure 21: Cerebral abscessation in a ewe. Photo: Lisa Buckley.

Meningoencephalitis

A ten-month-old lamb which had been noticed circling and stumbling, and possibly blind, prior to death was submitted to Sligo RVL. Three further animals were affected in the group. On post-mortem examination, there were some petechiae present on the diaphragm. On histopathology of the brain, there was diffuse, mild to moderate, acute, non-suppurative meningitis predominantly around the hind brain. In the medulla oblongata, there was diffuse, acute, severe suppurative encephalitis with severe, acute vascular cuffing, and microabscessation. Other laboratory tests failed to detect a pathogen. Meningoencephalitis was diagnosed as cause of death. The most important differential aetiology considered in this case is infection with *Listeria* species.

Musculo-skeletal

Osteoporosis

Athlone examined a nine-month-old lamb that had been found recumbent and died after two days. On post-mortem examination, there was marked subcutaneous haemorrhage over the right upper hindlimb with haemorrhage and tearing of the quadriceps muscle and a midshaft femoral fracture, and the bone was thin and fragile. There was also a fracture of the femoral head of the left hindlimb. The incisor teeth were brown and broken with thin sharp spikes. Histopathology of the bone found that the growth plates were abnormal. They were narrowed and sealed by a narrow plate of bone on the metaphyseal side. These changes could be indicative of osteoporosis/reduction in the quantity of normal bone. Samples of bone were sent for mineral analysis and the percentage of calcium in the femur and rib bones examined were both low, and bone ash analysis of the femur was also low. A conclusion of osteoporosis was made. The lamb was part of a group being fattened on a diet of fodder beet and homemade cereals (barley, wheat and oats) that was not balanced with minerals.



Figure 22: Brown and broken incisor teeth in a case of osteoporosis. Photo: Denise Murphy.

Trauma

A two-day-old lamb which had been born backwards (hindlimbs first), and was noticed in respiratory distress, was submitted to Sligo RVL. Post-mortem examination revealed that both rib arcades were fractured, which would have impaired breathing, as well as suckling, in the newborn and caused significant pain, and is the most likely cause of death.



Figure 23: Broken rib arcades in a newborn lamb. Photo: Rebecca Froehlich-Kelly.

Poisonings

Copper poisoning

A two-year-old ewe with a history of weight loss was submitted to Kilkenny RVL. On necropsy, the carcass was diffusely jaundiced, with marked jaundice of the liver. The kidneys were black in colour. The lungs were oedematous and congested, and the intestinal content was soft. The liver and kidney copper results were elevated, and a diagnosis of copper toxicity was made. Other results of note included a very high strongyle count and *Bibersteinia trehalosi* PCR positive results. A review of copper supplementation and parasite control were recommended.



Figure 24: Jaundiced liver and black kidney in a case of copper poisoning. Photo: Aideen Kennedy.

Laurel poisoning

Three adult ewes were submitted with a history of sudden death to Kilkenny RVL. A large quantity of leaves with an appearance consistent with laurel (*Prunus laurocerasus*) were found in the forestomachs of these animals. Several garden plant species are potentially toxic if ingested by farm animals. Laurel, a common garden hedge, is one such potentially toxic cyanogenic plant. Cyanide, the lethal agent of cyanogenic plants, prevents haemoglobin in erythrocytes from releasing oxygen to the tissues, with animals ultimately dying of anoxia.



Figure 25: Leaves consistent with laurel (*Prunus laurocerasus*) found in the forestomachs of ewes that died suddenly. Photo: Maresa Sheehan.

Miscellaneous

Omphalitis and hepatitis

A one-week-old lamb presented to Kilkenny RVL with a history of sudden death. At post-mortem, the liver was covered in white foci and the umbilical vein, still connected to the liver, contained pus. *T. pyogenes* was cultured. On histopathology, there was a severe necro-suppurative hepatitis. A diagnosis of omphalitis (navel ill) was made and a review of umbilical hygiene during the neonatal period was advised.



Figure 26: Hepatitis due to infection via the umbilicus. Photo: Lisa Buckley.

Goats

Abortion due to *Listeria ivanovii*

Dublin RVL investigated the fifth abortion from a goat farm with 80 milking goats. The previous abortions occurred over a period of three days. A set of twin caprine foetuses, of approximately four months gestation, was presented. No placenta was submitted. On gross post-mortem examination, both foetuses presented with multifocal-to-coalescing pale circular areas throughout the skin, and the livers of both foetuses were diffusely severely enlarged. In one of them, there were multifocal circular white foci throughout the liver surface. *Listeria ivanovii* was isolated from both foetuses from stomach contents and liver. Histopathology of the liver showed multifocal, necrotising hepatitis with bacterial colonies present, with a mild cellular response. The lung presented multifocal bacterial colonies scattered through the parenchyma. The skin showed evidence of bacteraemia (presence of bacteria within blood vessels). Gram-positive short rods were identified in lung, liver and skin. These findings are consistent with *L. ivanovii* being the primary cause of abortion in this case. *L. ivanovii* is a documented cause of abortion in sheep. The most common route of *L. ivanovii* exposure in sheep is from contaminated and/or poorly preserved silage.

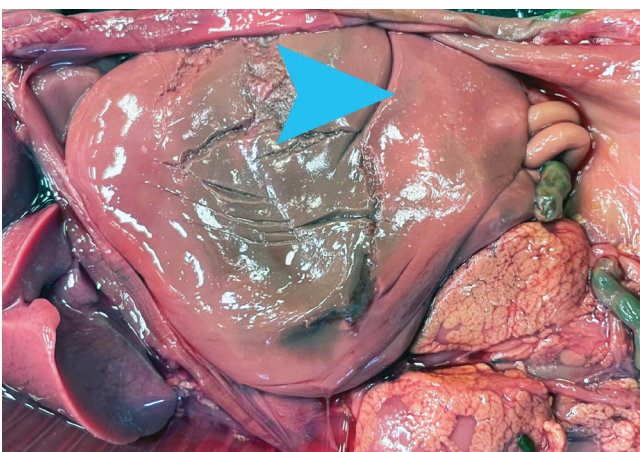


Figure 27: Area (Blue arrow) of focal hepatitis in a caprine foetus caused by infection by *Listeria ivanovii*. Photo: Sara Salgado.

Listeriosis in humans and ruminants is most frequently associated with *Listeria monocytogenes*, with *L. ivanovii* only occasionally identified. *L. ivanovii* mostly causes abortion in sheep and, less frequently, in other ruminants. Moreover, in contrast to *L. monocytogenes*, *L. ivanovii* has not been associated with meningitis or encephalitis. Outbreaks of profuse diarrhoea, fever, milk drop and apathy in ewes caused by *L. ivanovii* have been reported. The outbreaks are generally preceded by cold and wet weather where chilling from heavy rainfall may cause a temporary immunosuppression and facilitate the spread of *L. ivanovii* within the flock. Feeding of hay or silage, and/or a massive parasitic infestation represent additional risk factors.



Figure 28: Multifocal to coalescing pale circular areas throughout the skin. Photo: Sara Salgado.