

Regional Veterinary Laboratories Report

June and July 2020

Regional veterinary laboratories (RVLs) carried out necropsy examinations on 812 carcasses and 59 foetuses during June and July 2020. Additionally, 3,546 diagnostic samples were tested to assist private veterinary practitioners (PVPs) 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 June and July 2020. 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 in bovine carcasses submitted to the RVLs in June and July 2020.

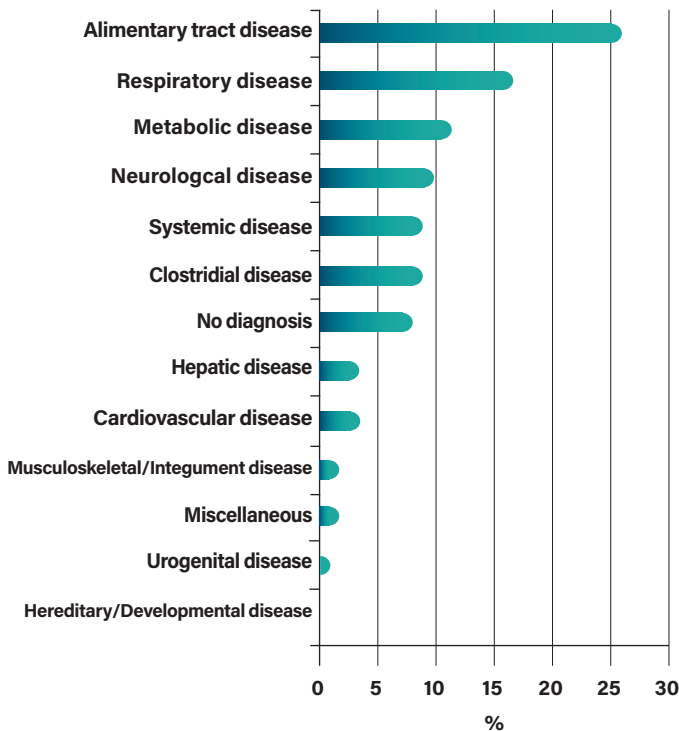


Table 1: Most commonly affected organ systems in bovine submissions (excluding foetuses) to the DAFM's RVLs.

GASTROINTESTINAL TRACT

Abomasitis

A two-day-old calf with a history of being weak and not suckling was submitted to Kilkenny RVL. It was the second case on the farm. The calf was very dehydrated. There was a diffuse, emphysematous abomasitis. There were multifocal areas of haemorrhage on the abomasal mucosa and foci of necrosis. The liver was bronzed in colour. Histology of the abomasum showed severe diffuse mucosal haemorrhage and severe diffuse submucosal oedema and emphysema. On the liver there was marked acute peri-acinar-midzonal degeneration and necrosis. The hepatic lesions were acute and likely secondary to hypoxia of the liver as a pre-terminal

event. The cause of the abomasitis was not established. Involvement of *Clostridial spp* or *Sarcina spp.* were likely differential diagnoses but could not be confirmed by laboratory testing. The referring practitioner was advised to continue to submit carcasses if further losses occurred to aid the identification of underlying agent.

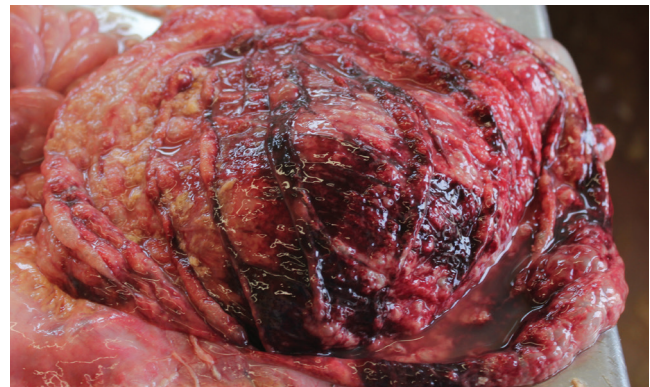


Figure 1: Haemorrhagic and emphysematous abomasitis. Photo: Aideen Kennedy.

Enterotoxaemia

A 3.5-month-old calf was submitted for examination to Limerick RVL after being found dead and bloated. On gross post-mortem examination there were haemorrhagic enteric contents. *Clostridium perfringens* and alpha and epsilon toxins were detected in intestinal contents. The results are consistent with *C. perfringens* type D. This is associated with pulpy kidney disease in sheep but also rarely causes enterotoxaemia in calves. A two-month-old calf was submitted to Limerick RVL with a history of sudden death.

Gastric torsion

Necropsy disclosed a strangulated gastric torsion. Affected abomasum and adjacent rumen were severely congested and necrotic and there was an associated acute fibrinous peritonitis.

Parasitic gastroenteritis

A five-month-old calf was submitted for necropsy to Limerick RVL. The carcass was in very poor body condition. The abomasal mucosa was thickened; the intestinal mucosa

was thickened, and the intestinal contents were liquid throughout. A scraping of the mucosal surface contained multiple nematodes. Histopathology confirmed severe parasitic enteritis. Negative results on a faecal egg count suggested the parasitic infection may have been acute or prepatent. A diagnosis of parasitic gastroenteritis was made.

RESPIRATORY TRACT

Bacterial pneumonia

A three-month-old calf was submitted for post-mortem examination to Sligo RVL. There was a history of *Mycoplasma bovis* infections in calves on the farm. On gross post-mortem examination, there was severe well-demarcated, cranioventral pneumonia with multifocal pinpoint areas of necrosis and abscessation. *Pasteurella multocida* and *M bovis* were detected in lung tissue. It was strongly advised to closely monitor the remaining animals of the management group as the presence of subclinical disease in these animals was considered likely.

Parasitic pneumonia

A five-month-old calf was presented for post-mortem examination to Kilkenny RVL from a herd where cohorts were coughing and presented with nasal discharge. On necropsy, there was a severe pneumonia affecting nearly the entire lung tissue. There was multifocal ground-glass emphysema and cranioventral consolidation. There were intralesional, adult lungworms seen. There were multifocal approximately 1-2mm-sized erosions and areas of necrosis affecting the mucosal surface of the abomasum. On histopathological examination of the lungs a severe diffuse chronic eosinophilic bronchointerstitial pneumonia with type II pneumocyte hyperplasia, hyaline membrane formation, and bronchiolitis obliterans was diagnosed. The lesions were consistent with parasitic pneumonia. Other causes of the lesions seen include respiratory syncytial virus (RSV) and bovine herpes virus-1 (BHV-1). These viruses were not detected. Cross sections of nematodes were seen in the abomasum. Parasitic pneumonia was diagnosed as the cause of death. A review of parasite control was recommended.



Figure 2: Ground glass emphysema and bullous emphysema (arrowhead) in a case of parasitic pneumonia. Photo: Aideen Kennedy.

Intussusception

Athlone RVL examined a four-week-old calf with a history of respiratory distress and death shortly after a treatment effort. Post-mortem examination revealed diffuse mild fibrinous peritonitis and excess ascitic fluid. There was a 3cm jejunal-ileal intussusception in the distal small intestine with dilated loops of bowel containing liquid ingesta proximally and empty intestines distally. There was right-sided anteroventral pulmonary consolidation with purulent exudate on cross section. There were multifocal 1-2cm diameter firm raised nodules in the spleen. *Trueperella pyogenes* was isolated from the spleen and lungs. Histopathology showed a multifocal bronchopneumonia and necrotising splenitis with thrombosis, associated with *T. pyogenes*, indicative of septicæmia.

CARDIOVASCULAR SYSTEM

Endocarditis

Athlone RVL examined a 10-month-old pedigree Limousin bull with a history of sudden death. Body condition was good. On gross post mortem, there was left-sided endocarditis involving the mitral valves. The lungs were heavy with extensive interlobular oedema. There were multifocal infarcts in the right kidney. *Escherichia coli* was isolated on bacterial culture and *Histophilus somni* was detected by a polymerase chain reaction (PCR) test.

In Ireland, *Histophilus somni* is most commonly associated with the bovine respiratory disease complex, often along with other bacterial pathogens. The other main clinical presentations in cattle are the consequences of septicaemic localisation of *H. somni*. These mainly relate to localisation in the brain, causing thrombotic meningoencephalitis, and the heart, causing myocarditis in the acute form, or abscessation often involving the left ventricular papillary muscle in more chronic cases.

NERVOUS SYSTEM

Cerebro-cortical necrosis (CCN)

A three-month-old calf was submitted to Limerick RVL with a history of neurological signs. Gross post-mortem examination revealed no visible lesions. Histopathology disclosed laminar necrosis of neurons in the cerebral cortex associated with cerebrocortical necrosis (CCN). This may also be found in other conditions such as lead poisoning, although since kidney lead levels were normal in this case, this is very unlikely. Severe enteritis was also disclosed upon histopathology. Disturbance of gastro-intestinal flora is associated with thiamine deficiency causing CCN so it is possible that gastrointestinal tract (GIT) disease was a precipitating factor in this case.

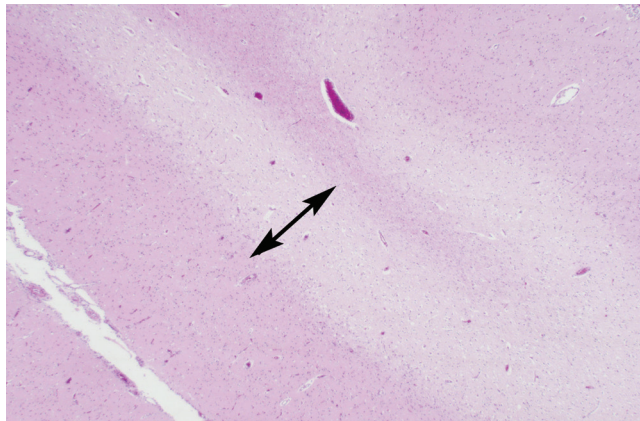
A calf with a history of being weak, having a seizure and dying within five hours was presented to Kilkenny RVL for post-mortem examination. The only significant finding on post mortem was that the brain fluoresced when examined with an ultraviolet Woods lamp. On histopathology multifocal



I REGIONAL VETERINARY LABORATORIES REPORT

to coalescing areas of laminar necrosis with gutter cells and perivascular cuffing was observed affecting the laminae of the cerebral cortex. There was some mononuclear perivascular cuffing in the midbrain. The observed changes are highly suggestive of cerebrocortical necrosis. A move to lush pasture, increased consumption of concentrates causing the production of microbial thiaminases in the rumen and a high sulphur content in the diet are some of the causes of CCN. Information regarding the diet of the affected animals, recent applications of fertiliser or other clinical findings can assist in determining the cause of an outbreak.

A



B

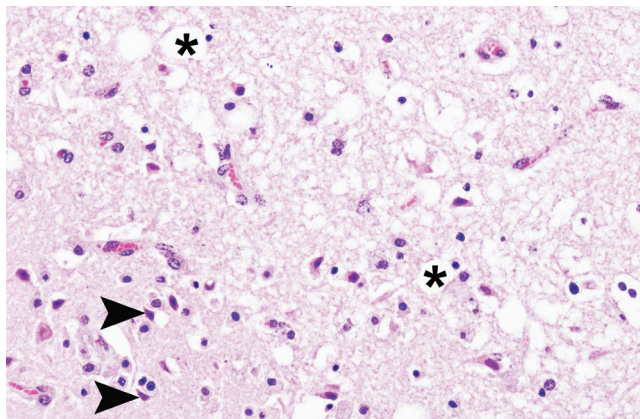


Figure 3: Section of cerebral cortex showing A: laminar pallor (indicated by a double-headed arrow) and B: vacuolation (indicated by an asterisk*) in a laminar pattern with neuronal necrosis (indicated by single arrow heads). These changes are consistent with cerebro-cortical necrosis. Photo: Rebecca Froehlich-Kelly.

Athlone RVL had several cases of cerebrocortical necrosis (CCN) in calves over the summer months. Unusually, one case was in a 2.5-year-old dairy cow with a history of nervous signs, going blind and becoming recumbent. It was the second similar case in a few days. The herd owner had recently bought a new farm and it was his first time to graze it. Carcase preservation was poor and there were no visible lesions. The brain presented with fluorescence under UV light which is suggestive of CCN. Kidney lead levels and eye fluid magnesium concentration were within normal ranges.

Histopathology of the brain showed laminar cortical necrosis of the cerebral cortex and prominent blood vessels consistent with CCN.

MUSCULOSKELETAL

Clostridial myositis - blackleg

Athlone RVL saw several cases of clostridial myositis, or blackleg, over the summer. In one case, a six-month-old weanling was examined with a history of having been found dead after a change of pasture four days earlier. It was the first loss. Carcase preservation was poor. There was marked subcutaneous crepitus in the hindquarters bilaterally and dark, dry, haemorrhagic, sweet smelling myositis lesions in both hindquarters. There was a focal dark lesion in the left ventricular heart muscle. The liver and kidneys were autolysed. *Clostridium chauvoei* was detected in the lesions by fluorescent antibody test (FAT). The gross lesions and identification of clostridial species make clostridial myositis (blackleg) the most likely cause of death.

A four-month-old calf with a history of being 'off form' for the previous day was delivered to Limerick RVL. This was the third similar death on the farm in recent weeks. On post-mortem examination, there were dark red to black discoloured myositis lesions in the gluteal musculature (Figure 6). *C. chauvoei* was identified by FAT. Blackleg was diagnosed as cause of death and vaccination of the remaining cohort with a multivalent clostridial vaccine was advised.

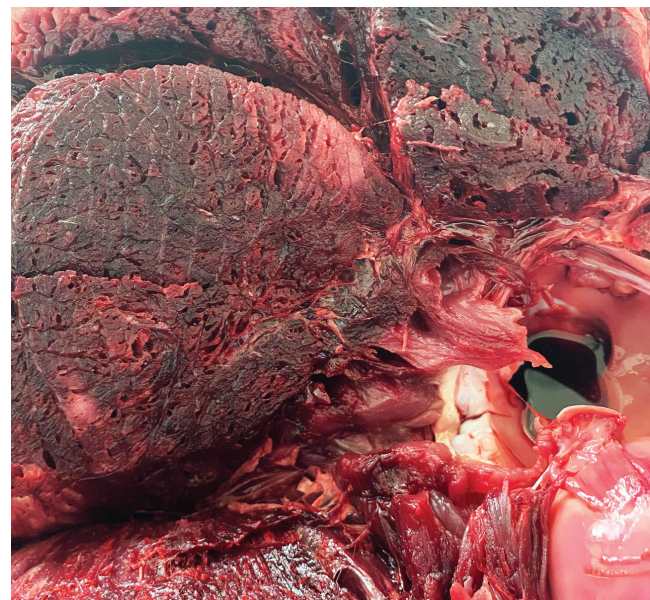


Figure 4: Dry myositis in the gluteal musculature associated with *Clostridium chauvoei* in a calf. Photo: Alan Johnson.

POISONINGS

Bracken poisoning

Kilkenny RVL investigated a number of deaths in cows on a farm. A 26-month-old cow was submitted with a history of being off form for a few days and previous losses on the farm from a haemorrhagic condition. On gross post-mortem examination there were multifocal areas of haemorrhage in the abomasal serosa, peritoneum, and pleural



aspect of the ribs, heart, lungs and spleen. On histological examination a marked thrombocytopenia (Figure 5) was detected along with marked interstitial suppurative bacterial pneumonia, suppurative bacterial hepatitis and paracentral hepatic necrosis. *E. coli* was isolated from the lung and liver. Thrombocytopenia (absence of megakaryocytes) in the bone marrow results in lack of platelets in the blood leading to increased haemorrhages. The paracentral hepatic necrosis can be attributed to hypoxic damage to the liver and most commonly follows anaemia or blood loss. A hypoplasia of bone marrow leucocyte precursors was also suspected, which may have increased susceptibility to systemic bacterial infections such as the colibacteraemia with attendant pneumonia and hepatitis detected in this case. The main differentials for thrombocytopenia in adult cows are acute bracken fern ingestion and bovine viral diarrhoea virus-2 (BVDV-2). BVD testing was negative. Further investigation with the farm of origin confirmed access to bracken fern (*Pteridium sp*) on pasture and possibly in preserved forages.

One month later, a four-year-old cow was submitted from the same farm with a history of passing bloody urine. On gross post-mortem examination, the urinary bladder contained a small volume of dark red urine and three small (0.5-1cm), raised, dark red, circular lesions in the mucosa of the bladder. The liver had a marked lobulated pattern with multifocal pale spots in the parenchyma. On histological examination, the urinary bladder lesions were identified as well as nodular haemangiomas (Figure 6), which are consistent with bovine enzootic haematuria. Bovine enzootic haematuria is the clinical syndrome caused by chronic bracken fern ingestion in cattle. Histological examination of the liver revealed extensive dissecting and bridging hepatic fibrosis affecting 30-40% of the liver parenchyma, accompanied by marked biliary hyperplasia and hepatocyte megalocytosis. This pattern of liver injury is most commonly seen in association with ingestion of hepatotoxins such as pyrrolizidine alkaloids (ragwort, *Senecio jacobea*) or aflatoxins. Further investigation with the farm of origin confirmed access to both bracken fern and ragwort on pasture and in preserved forages.

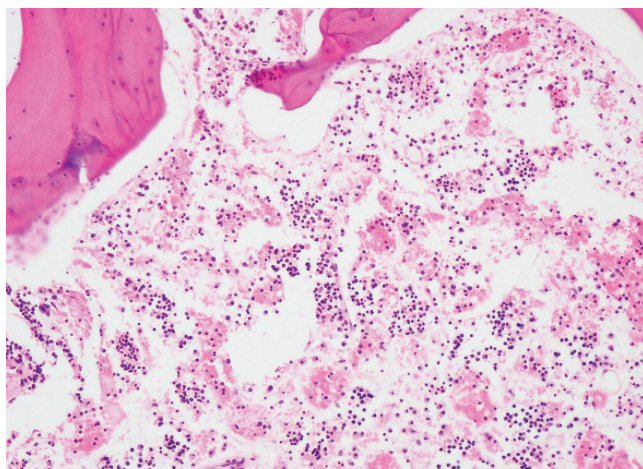


Figure 5: Bone marrow thrombocytopenia sternebrae.
Photo: Margaret Wilson.

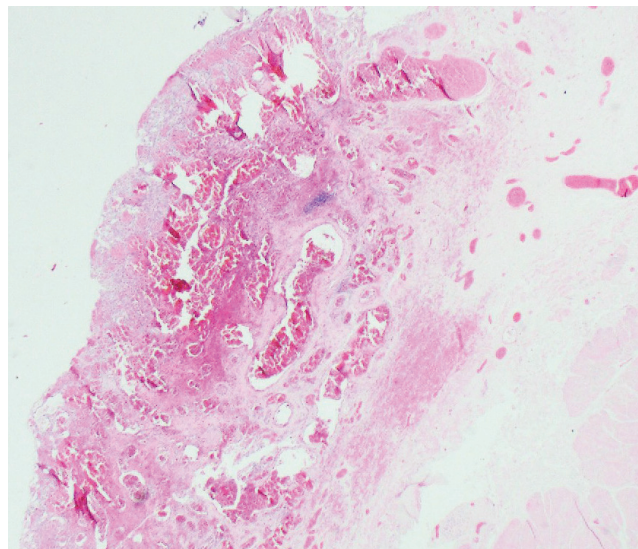


Figure 6: Haemangioma in the bladder associated with bracken fern poisoning in a cow. Photo: Margaret Wilson.

Bracken poisoning in cattle typically presents as either one of two syndromes: acute poisoning with bone marrow suppression; or enzootic haematuria.

Acute bracken poisoning

Occurs following the ingestion of large quantities of bracken within a relatively short period of time (weeks-months). It results in bone marrow suppression that begins with the depletion of megakaryocytes and then extends to panhypoplasia. The signs of acute poisoning may take up to eight weeks post ingestion to occur. Because of the panhypoplasia at presentation, secondary infections are also common.

Enzootic haematuria

Occurs as a result of chronic ingestion of smaller quantities of bracken over a long period of time (weeks to years), the toxic effect for enzootic haematuria is cumulative, therefore possibly repeated exposure over multiple years may be involved. The onset of clinical disease can be delayed several weeks/months after removal of vulnerable animals from source of bracken ingestion.

Both syndromes are attributed to the radiomimetic properties of ptaquiloside, the active substance which causes the disease. Initially, it damages the rapidly dividing bone marrow cells, and is later carcinogenic (with the bladder being a specifically affected location as ptaquiloside is excreted in urine).

Lead poisoning

A three-month-old female calf was submitted to Limerick RVL with a history of sudden onset recumbency. A kidney lead cortex concentration of 223µmol/kg was found; levels greater than 120µmol/kg are a sufficient basis for diagnosis of lead toxicity without corroborating evidence. A diagnosis of lead poisoning was made.

MISCELLANEOUS

Neoplasia

An eight-year-old cow with a history of failing for several months and no improvement on treatment attempts was submitted to Sligo RVL. Post-mortem examination revealed a large (approximately 20cm in diameter) multilobulated and peduncular cystic mass surrounding the small intestinal wall and involving mesentery. Multifocally gut mucosa and wall was segmentally thickened but rarely did thickening extend around entire circumference of sections examined. Multifocally mesenteric lymph nodes enlarged. The cause of the ill thrift and clinical signs observed in this cow was due to neoplasia of the gut, which obstructed gut flow and impaired absorption. The likely tumour type is an adenocarcinoma which is typically highly aggressive and readily metastasises causing strictures as occurred in this case. This tumour is relatively rare but the presentation in this case is typical.

Besnoitiosis

A nine-year-old cow displaying alopecia and skin thickening and unresponsive to antibiotic treatment was ultimately serologically tested for *Besnoitia besnoiti* in the Cork RVL. A positive serological result in this animal was followed by histological examination of a skin biopsy that confirmed the presence of the parasite in the subcutaneous tissue (Figure 7). The section showed numerous cysts that consisted of a thick hyaline capsule that surrounds a rim of host cell cytoplasm containing numerous densely packed bradyzoites (Figure 8). There was a mild inflammatory reaction of lymphocytes and some eosinophils in the periphery of the cysts. These microscopic lesions confirmed the presence of *B. besnoiti* in this animal (besnoitiosis). Subsequently, the whole herd was tested by serology, and 18 per cent of the animals were positive for besnoitiosis.

Besnoitiosis, historically exotic to Ireland, is caused by an apicomplexan protozoan that was diagnosed for the first time in Co. Tipperary in 2015 (Ryan EG, 2016). This current case last June is the third case diagnosed in Ireland and the second case in Co. Cork. The presentation in cattle is typically chronic and is characterised by alopecia with thickening, fissuring of the skin, subcutaneous oedema and generalised lymphadenopathy. In addition, cysts in the intima of blood vessels can cause vasculitis and thrombosis, which result in reduced blood flow; this can lead to male sterility when the scrotum is affected. Clinical disease is generally associated with immunosuppression (a possibility in the case of this nine-year-old cow), stress, and young age. It is transmitted by horizontal mechanical transfer between intermediate hosts by blood-sucking insects. However, other arthropods, iatrogenic transfer and direct contact including sexual transfer are possible routes of transmission.



Figure 7: Photomicrograph demonstrating skin lesions in a cow with besnoitiosis (*Besnoitia besnoiti*). Note the numerous protozoal oocysts (arrows) in the subcutaneous tissue of the section and mild inflammatory infiltration surrounding the cysts. Photo: Cosme Sánchez-Miguel.

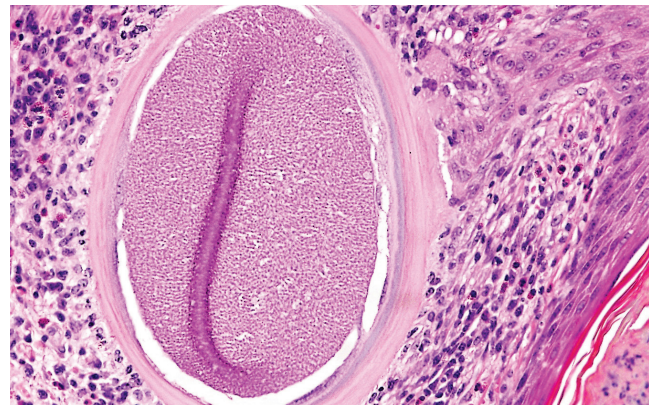


Figure 8: Photomicrograph demonstrating a single protozoal cyst formed by a thick hyaline extracellular capsule containing abundant bradyzoites. The bradyzoites are packed into a parasitophorous vacuole which fills the enlarged host cell. Photo: Cosme Sánchez-Miguel.

Reference

Ryan EG, Lee A, Carty C, O'Shaughnessy et al. (2016) Bovine besnoitiosis (*Besnoitia besnoiti*) in an Irish dairy herd; *Veterinary Record* 178, 608.

Tick-borne diseases

A three-year-old cow was submitted to Limerick RVL with a history of sudden death; the owner suspected babesiosis. Necropsy disclosed a pale carcass and haematuria. No internal haemorrhages were observed. The result of a PCR test for babesiosis was positive. Babesiosis is an example of a disease rarely diagnosed at necropsy in the RVLs, since animals lost to this condition are often diagnosed on the farm by the veterinary practitioner, ie. they are seen passing haemoglobin in the blood, or are found sick on land with a history of tick-borne disease, or both. Sligo RVL examined the carcass of a four-year-old cow with a history of sudden death. On necropsy, there was severe dehydration. The intestinal mucosa appeared reddened. There was a large amount of watery gastro-intestinal contents. There were multifocal pale areas on the liver

(0.5cm). The urine appeared dark. The blood was watery. The left kidney had a fluid-filled cyst on the caudal pole. *Anaplasma phagocytophyllum* was detected in the spleen. On histopathology of the kidney there was multifocal, interstitial nephritis. The liver presented with multifocal, moderate, acute hepatitis with congestion and multifocal vacuolation. It is assumed that tick-borne fever is most likely the underlying disease, leading to death by septicaemia.

SHEEP

Pneumonia and parasitic gastroenteritis were the most common diagnoses in sheep submitted to the RVLs in June and July 2020.

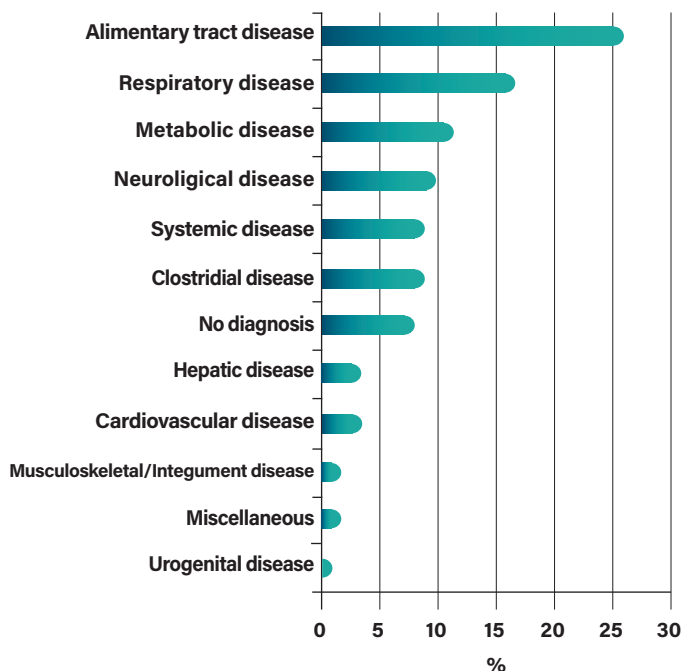


Table 2: Causes of mortality by organ system in sheep carcasses submitted to DAFM RVLs in June and July 2020.

GASTROINTESTINAL TRACT

Enterotoxaemia

Limerick RVL conducted a necropsy on a lamb which disclosed a severely inflamed and dilated small and large intestines with haemorrhagic contents; the kidneys were autolysed. An ELISA carried out on intestinal contents for *C. perfringens* detected both the organism and epsilon toxin. *Clostridial enterotoxaemia* was diagnosed, most likely due to *C. perfringens* type D.

RESPIRATORY TRACT

Ovine pulmonary adenocarcinoma

Sligo RVL examined a two-year-old ewe with a history of sudden death. On post mortem examination the lungs appeared to be 80% consolidated. DNA specific for jaagsiekte sheep retrovirus (JSRV) was detected by PCR. *Mannheimia haemolytica* was cultured from lung tissue. Histopathology of the lung revealed multifocal areas where alveolae were filled and replaced by neoplastic epithelial cells consistent with ovine pulmonary adenocarcinoma. There was multifocal,

moderate, acute, suppurative pneumonia. OPA (Jaagsiekte) with secondary bacterial pneumonia was diagnosed as most likely cause of death.

Laryngeal chondritis

A three-month-old Texel lamb was submitted to Kilkenny RVL with a history of sudden death. On post-mortem examination, there was bilateral necrotic laryngeal chondritis with abscessation. The lungs were diffusely congested with a rubbery texture. The lymph nodes were moderately increased in size. *M. haemolytica* was cultured from the lung and larynx, in addition there was a faecal trichostrongyle egg count of 2,100 eggs per gram (epg) and a review of parasite control was recommended.



Figure 9: Bilateral necrotic laryngeal chondritis in a lamb. Photo: Aideen Kennedy.

Laryngeal chondritis is a disease of undetermined aetiology, characterised by oedema, ulceration, abscessation and necrosis of the laryngeal mucosa and cartilage. Laryngeal chondritis has been reported in sheep, horses and cattle. In the case of sheep a predisposition of the Texel breed is suggested, although the condition is not exclusive to this breed. The pathogenesis remains unclear; it is believed, however, that lesions on the laryngeal mucosa allows entry of pathogens which leads to inflammation in the cartilage. Reasons postulated as the cause of mucosal lesions include dosing gun injuries and repeated trauma of the larynx due to dyspnoea.

Traumatic pharyngitis - dosing-gun injury

A lamb was submitted to Kilkenny RVL with suspected pneumonia. It was the second case in the flock. On examination, the lamb was dehydrated. There was a necrotic tract in the oropharynx adjacent to the larynx. It was considered likely the lesions near the larynx were due

I REGIONAL VETERINARY LABORATORIES REPORT

to trauma, possibly a dosing gun injury, with the pneumonia likely secondary. A review of dosing technique was recommended.

URINARY/REPRODUCTIVE TRACT

Mastitis

A five-year-old ewe was submitted to Sligo RVL with a history of sudden death and being the third death within the past month. Post mortem examination revealed severe purulent mastitis on the right udder half. There was acute fasciolosis. *Staphylococcus aureus* was cultured from the udder and kidney. Mastitis and septicaemia with concurrent acute fasciolosis was diagnosed as cause of death. Sligo RVL examined a six-year-old ewe which had been found dead. The left udder half presented with purulent mastitis. There was localised peritonitis on the liver serosa. *Bibersteinia trehalosi* was cultured from mammary tissue. There was a very high roundworm egg count. Mastitis and septicaemia were diagnosed most likely cause of death. There was also concurrent parasitic gastroenteritis. Worm egg counts in weak or moribund animals can rise, but it is recommended to examine faecal samples of the management group to assess the parasitic burden and treat if indicated.

NERVOUS SYSTEM

Encephalitis

Athlone RVL examined a five-week-old lamb with a history of having been found dull, frothing from the mouth and then starting to circle. It had been treated for vitamin B1 deficiency and was the 15th similar loss. Carcass preservation was poor with liver and there were no significant lesions. *Listeria monocytogenes* was cultured from the liver and PCR for tick-borne fever was positive. Histopathology of the brain showed marked microabscessation in the hindbrain and perivascular lymphocyte cuffing consistent with listerial encephalitis. A diagnosis of listerial encephalitis and septicaemia secondary to tick-borne fever infection was made. Tick-borne fever can lead to profound immunosuppression and render the lamb susceptible to secondary infections.

POISONINGS

Copper poisoning

Athlone RVL examined a four-month-old lamb with a history of having been found dead. It was the fourth similar loss in a week. On gross examination, there was marked jaundice of carcass. The kidneys were very dark/black and the urine was very dark red (Figure 10). Liver copper levels were 6mmol/kg and kidney copper levels were 3.2mmol/kg; both extremely high and indicative of chronic copper toxicity. The PVP confirmed that the dead lambs had received both creep meal and a trace element bolus containing copper. These boluses are not recommended for lambs weighing less than 30kg and in breeds susceptible to copper toxicity (eg. Texel and Blue-faced Leicester).



Figure 10: Jaundiced liver, black kidneys (gun-metal colour) and haematuria in a case of copper toxicity in a lamb. Photo Denise Murphy.

OTHER SPECIES

Goats

Athlone RVL examined two native Irish goats with a history of scouring for a few days prior to death as they had been on very rich pasture. These were the third similar losses. Their tails were heavily stained with faeces and body condition was poor with serous atrophy of fat. The abomasal mucosa was grey and thickened with a cobblestone appearance and small and large intestinal contents and faeces were very loose. There were multifocal pale/white circular 1-2cm firm lesions in both caudo-dorsal lung lobes. Faecal egg counts of 5,800epg and 16,300epg were recorded. Histopathology of the abomasum showed hyperplastic, dilated glands and marked lymphocytic infiltrate in lamina propria consistent with parasitic abomasitis and parasitic granuloma were seen in the lungs. A diagnosis of parasitic gastroenteritis with parasitic granulomas in lungs was made and advice regarding anthelmintic treatment of the comrades was given. Two kid goats were submitted to Limerick RVL with a history of ill thrift. Necropsy disclosed soft intestinal contents and thickened intestinal mucosa. The abomasal mucosa of one kid was severely inflamed; microscopy of mucosal scrapings disclosed the presence of nematodes. Extremely high faecal egg counts were detected. Histopathology from both animals disclosed severe enteritis and abomasitis. A diagnosis of parasitic gastroenteritis was made. Sligo RVL diagnosed copper poisoning in a two-year-old Boer goat. The owner reported wheezing a day prior to death. On post-mortem examination there was generalised jaundice. The liver was orange discoloured and the kidneys showed gun metal colour. Copper levels in liver and kidney were in the toxic range. Gross findings and high copper tissue levels were highly suggestive of chronic copper poisoning. It is noteworthy that while goats seem to be more resistant to copper poisoning than sheep, literature suggests a higher susceptibility of some breeds, including Boer goats to copper poisoning.

Rabbits

Limerick RVL received three dead rabbits from a pet farm which had been found dead. On necropsy they presented with multifocal liver abscesses (Figure 11). Laboratory testing revealed a very high load of *Coccidial* oocysts in the faeces. Hepatic coccidiosis was diagnosed as cause of death.



Figure 11: Multifocal abscessation in the liver of a rabbit in a case of hepatic coccidiosis. Photo: Alan Johnson.

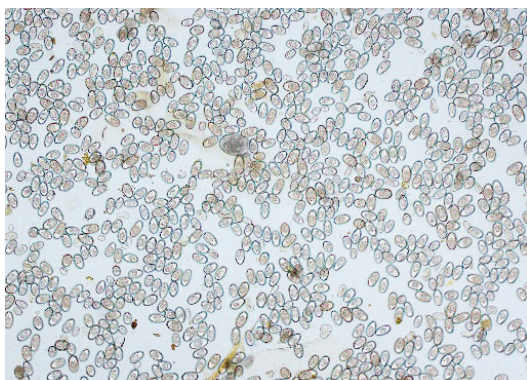


Figure 12: Large amounts of Coccidial oocysts present in a faecal sample in a case of hepatic coccidiosis. Photo: Alan Johnson.

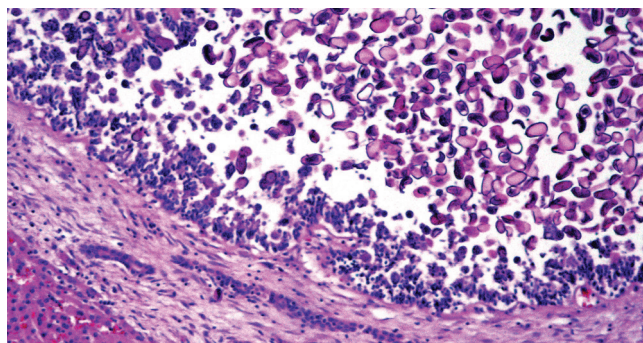


Figure 13: Hepatic coccidiosis in a rabbit (100x). Photo: Alan Johnson.

Chicken

Two organic free-range laying hens from a commercial enterprise were submitted to Limerick RVL for necropsy. One of the hens was sick and listless for a few days. The other was found dead. Both birds had gross lesions consistent with a diagnosis of egg peritonitis. *E. coli* was isolated. Parasitological examination of faecal samples showed high number of *Ascaridia* spp. eggs and low numbers of *Capillaria* spp. eggs. *Coccidia* oocysts were also seen in the second bird.

In any flock of laying birds, there will be a small number of deaths associated with egg peritonitis. In large units 1% per month is usually the observed prevalence. If the mortality rises above this level due to this diagnosis, it might be advisable to examine the management routine in place for the birds. It is essential that any increased mortality events in all flocks but especially free range flocks are properly investigated and that a satisfactory diagnosis is made so as to ensure that an exotic or notifiable disease is not present.

Ascaridia spp. are not highly pathogenic, but clinical effects may be seen in young birds. In free-range systems where an issue arises, the young birds may have to be separated and reared on ground not previously used for birds.

Capillaria spp. are more pathogenic worms. Young birds are most susceptible. Some species require the earthworm as an intermediate host.

Goose

An eight-year-old goose was found dead and submitted to Kilkenny RVL. On examination the goose was in poor body condition. The liver was enlarged and there were multifocal white firm coalescing pale areas. Histology of the liver led to a diagnosis of adenocarcinoma.

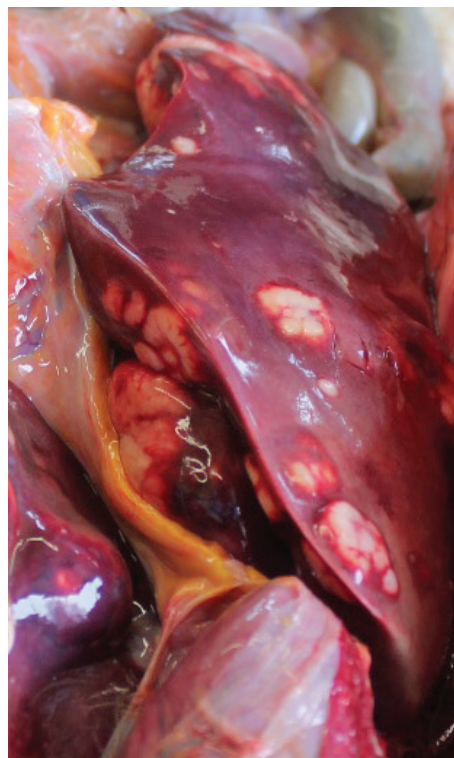


Figure 14: Hepatic adenocarcinoma in a goose. Photo: Aideen Kennedy.