

# Regional Veterinary Laboratories Report

JUNE 2021

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 411 carcasses and 29 foetuses during June 2021. Additionally, 1,393 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 June 2021. 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 June 2021.

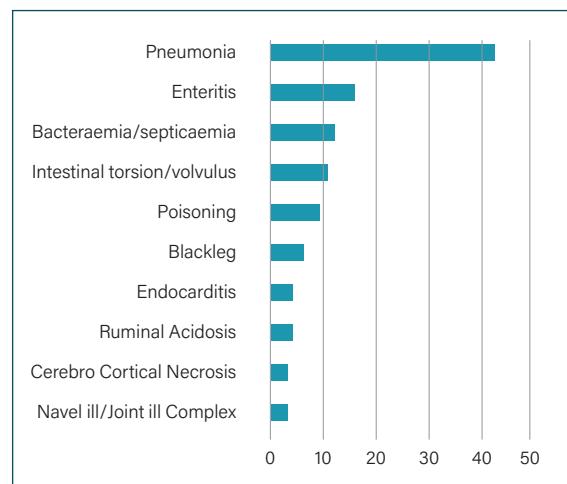


Table 1: The most common diagnoses in bovine animals submitted for necropsy in June 2021.

## GASTROINTESTINAL TRACT

### Enteritis

Sligo RVL received a three-month-old calf with some haemorrhagic faeces before a sudden death. Upon necropsy there was haemorrhagic colitis. The lung presented with a 1cm sized abscess in the left cranioventral lobe. There was a severe enteric infection with coccidia detected in the intestinal contents. *Mannheimia haemolytica* and *Histophilus somni* were detected in lung tissue. On histopathology, there was diffuse, acute, severe, necrotising enteritis with large amounts of coccidial life stages present. The lung presented with diffuse, acute-to-chronic, suppurative pneumonia. Colitis due to coccidiosis was diagnosed as cause of death with concurrent severe bacterial pneumonia.

### Hepatic abscessation

A two-year-old cow which had died suddenly was delivered to Sligo RVL. The owner had observed a milk drop the day

previous and the animal developed tarry faeces. Necropsy disclosed diffuse miliary liver abscessation with some abscesses up to 2cm in size. There was a severe chronic peritonitis with adhesions between liver, reticulum and diaphragm. There were three abomasal ulcers approximately 2cm in diameter with severe haemorrhagic abomasal and intestinal contents. Upon histopathology of the liver, there was diffuse, chronic, severe hepatitis with severe multifocal abscessation. A pathogen could not be identified but embolic bacteraemia following acidosis and rumenitis was considered likely.

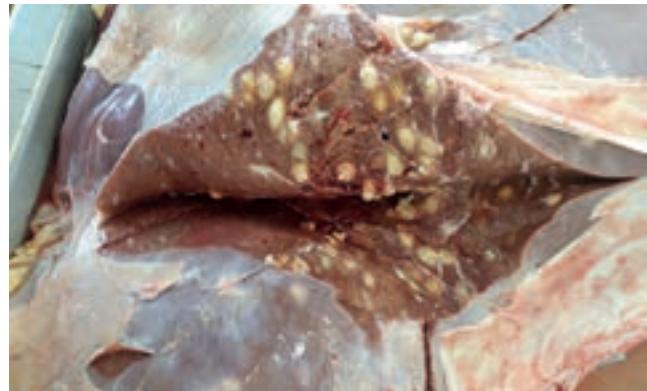


Figure 1: Liver abscessation in a cow. Photo: Rebecca Froehlich-Kelly.

## RESPIRATORY TRACT

### Pneumonia

A three-month-old calf with a history of ill thrift was submitted to Kilkenny RVL. This was the fifth case in the herd. Examination of the lungs showed cranioventral consolidation affecting approximately 40 per cent of the lungs. There were focal abscesses 1-2cm in diameter within the consolidated region. There were multiple foci of fibrin on the cranial pleura. Caudally, the lungs were oedematous and had a meaty texture. In addition, there was laryngeal chondritis which may have contributed to development of pneumonia in this case. *Pasteurella multocida* was cultured from multiple organs suggesting bacteraemia/septicaemia. Lung swabs also tested

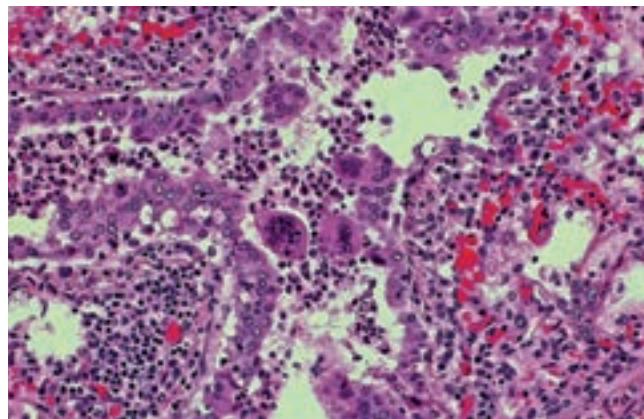
positive upon polymerase chain reaction (PCR) for bovine respiratory syncytial virus (BRSV), parainfluenza 3 virus (PI3) and *Bibersteinia trehalosi*. A review of on-farm respiratory disease control was recommended.



**Figure 2: Chondritis in a calf with pneumonia. Photo: Aideen Kennedy.**

A three-month-old bovine from a group of calves with respiratory signs was submitted to Kilkenny RVL for necropsy. On necropsy, there was a severe pneumonia with cranoventral consolidation, more severe on the right side. There was extensive ground glass emphysema and bullae formation. The mucosal lining of the trachea was hyperaemic with petechial haemorrhages. BRSV and *Mycoplasma bovis* were detected by PCR. Histopathology revealed an acute broncho-interstitial pneumonia with bronchiolar epithelial hyperplasia and degeneration with syncytial cell formation, subacute suppurative bronchopneumonia and hyperplasia of the bronchus-associated lymphoid tissue (BALT). BRSV was isolated from this case and the history would suggest the animal was still being reared indoors; a review of RSV control was recommended. *Mycoplasma bovis* was also detected from this case, although there was mild BALT hyperplasia, other changes associated with *Mycoplasma bovis* were not seen in the section examined.

However, it was noted that this agent is capable of causing a number of different clinical presentations including pneumonia and otitis in calves and arthritis and mastitis in cows.



**Figure 3: Syncytial cells (centre) associated with the detection of BRSV in bovine lungs. Photo: Maresa Sheehan.**

### Parasitic pneumonia

Athlone RVL examined a four-month-old calf with a history of coughing. There had been no response to treatment. There was one other similar death reported in the herd. Necropsy disclosed marked, diffuse, subpleural and interlobular emphysema with bullae which was most severe caudo-dorsally. A large number of lungworms were seen in the trachea, bronchial tree and throughout the lung parenchyma. A Baermann test of lung tissue revealed moderate lungworm infection. *H. somni*, *Mycoplasma bovis* and *P. multocida* were detected in lung tissue by PCR. On histopathological examination of the lung, there was a marked, diffuse, chronic-active, interstitial pneumonia with hyaline membrane formation and type 2 epithelialisation, and there were multifocal areas of suppurative bronchopneumonia. A diagnosis of parasitic pneumonia and secondary bronchopneumonia was made.

### CARDIOVASCULAR SYSTEM

#### Vegetative endocarditis

Athlone RVL examined a three-month-old calf with a history of respiratory signs and inappetence since the previous day, with no response to treatment. Necropsy disclosed a large (1-2cm), friable, yellow/grey, vegetative lesion present on the tricuspid (right atrio-ventricular) heart valve, and a severe, diffuse, fibrinous pericarditis. There were multifocal, raised, firm pale areas of necrosis in the myocardium; the most severe lesions were on the apex of the heart and the right ventricle. The liver was diffusely enlarged and jaundiced with hepatic lymph node enlargement. There was bilateral kidney enlargement with multifocal white pinpoint areas on the cortical surface. *Listeria monocytogenes* and *Escherichia coli* were isolated from myocardial tissue. A diagnosis of valvular endocarditis, pericarditis and myocarditis was made. The vegetative endocarditis was most likely the primary lesion, resulting in septic emboli spreading to the kidneys and myocardium. A three-month-old calf with a history of ongoing fever for the previous three weeks was submitted to Sligo RVL. Necropsy revealed a vegetative endocarditis in the right ventricle. A bacterial pathogen could not be identified. On histopathology there was diffuse, chronic-active, severe, suppurative myocarditis with extensive bacterial colonies.



**Figure 4: Vegetative endocarditis in the right ventricle of a calf. Photo: Rebecca Froehlich-Kelly.**

## Vena caval thrombosis

A two-year-old dairy cow was submitted to Kilkenny RVL with a history of infrequent small nose bleeds. The cow was treated with antibiotics but a large volume haemorrhage from the nose occurred prior to death. On examination, there was cranoventral consolidation affecting approximately 20 per cent of the lungs. Within the consolidated region, there was an area of necrosis and a thrombus adjacent to a blood vessel. Caudally, there was multifocal embolic pneumonia. In the abdominal cavity, there was abscessation adjacent to the vena cava near the diaphragm.

There were multifocal white foci in the liver. Culture results were sterile, likely due to recent treatment. A diagnosis of vena caval thrombosis and embolic pneumonia was made. The most common cause of vena caval thrombosis is ruminal acidosis leading to rumenitis, embolic bacteraemia, liver and lung abscessation, which may result in a thrombus in the caudal vena cava if the vessel wall is infiltrated by the abscess.

## NERVOUS SYSTEM

### Cerebrocortical necrosis

Athlone RVL examined a three-month-old calf with a history of recumbency and nervous signs. The animal was treated for meningitis but didn't respond and was euthanised. Rumen contents were dry and the intestines were contracted and empty, and there was thick inspissated bile in the gall bladder; all of which are suggestive of recent inappetence. Grossly, there was flattening and yellowing of the gyri of the cerebral hemispheres and the brain fluoresced under ultraviolet light which is suggestive of cerebrocortical necrosis (CCN). Kidney lead levels were normal.

Histopathology of the cerebrum showed laminar necrosis of neurons, consistent with CCN. CCN is associated with thiamine deficiency; diets may be deficient in thiamine or contain excess sulphur as well as some other less common causes including water deprivation/salt poisoning. Frequently, animals are on lush grass when an outbreak occurs. Information regarding the diet of the animals, recent applications of fertilizer, or other clinical findings may assist in determining the cause of an outbreak.

## MUSCULOSKELETAL

### Septic arthritis

Sligo RVL received a three-year old bull with a history of a swollen hip joint and stiffness. On post-mortem examination, there was polyarthritis affecting the carpal and tarsal joints. The carpal joints in particular contained purulent fluid and necrotic material. There was liver abscessation and septic vena caval thrombosis. The lung presented with multifocal abscessation. Histopathology of the liver revealed chronic severe multifocal suppurative hepatitis with abscessation. There was also acute severe, suppurative interstitial pneumonia with abscessation. Cause of death in this case was most likely septic arthritis and hepatic abscessation with bacteraemia and embolic showers. A causative pathogen could not be identified. Ante-mortem antimicrobial treatment can impair bacterial culture in some cases.



**Figure 5:** Septic arthritis in a bull. Photo: Rebecca Froehlich-Kelly.

### Blackleg

Athlone RVL examined a five-month-old calf with a history of having been noticed the previous day with a high temperature and respiratory signs.

Three other calves had died and five were sick. These calves had been bought-in in the spring and had been housed up until two weeks previously; they had been coughing and had been dosed for worms. There were dry haemorrhagic myositis lesions on a cross section of the tongue and the diaphragm muscles and there was a severe diffuse fibrino-haemorrhagic pericarditis.

Fluorescent antibody technique (FAT) testing for *Clostridium chauvoei* was positive and histopathology of tongue showed diffuse myonecrosis with haemorrhage, neutrophil infiltration and rod-shaped bacilli likely to be *Clostridium sp.* A diagnosis of clostridial myositis or blackleg was made and advice regarding the vaccination of comrades with a multivalent clostridial vaccine was given.



**Figure 6:** Blackleg lesions in the tongue of a calf. Photo: Denise Murphy.

## POISONINGS

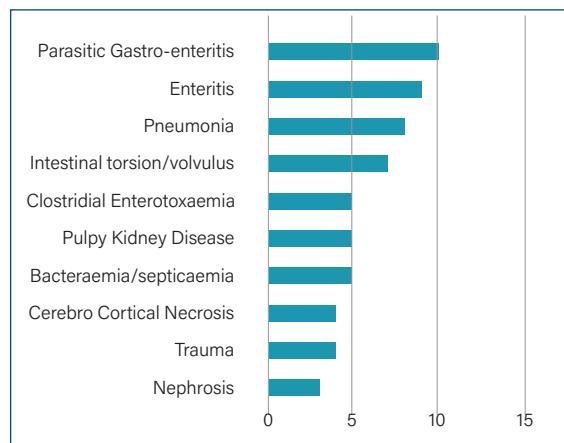
### Lead poisoning

Sligo RVL diagnosed several cases of lead poisoning. In one case, two yearling heifers with neurological symptoms were submitted after euthanasia. Pieces of lead mesh were discovered in the reticulum of both animals. Lead concentrations measured in kidney tissue were in the toxic

and very high ranges respectively. Machinery batteries (cars, tractors etc) contain lead grills in their positive and negative plates. Discarded and broken-down batteries are the most common cause of lead poisoning cases submitted to the RVLs. In cases where lead poisoning is diagnosed, identification and removal of the lead source and identification of any potentially exposed animals is essential to mitigate any risk to the food chain.

### SHEEP

Parasitic gastro-enteritis and enteritis were the most common diagnoses from the necropsy of sheep in the RVLs during June 2021.



**Table 2: The most common diagnoses in ovine animals submitted for necropsy in June 2021.**

### RESPIRATORY TRACT

#### Embolic pneumonia

A three-month-old lamb died suddenly and was submitted to Kilkenny RVL. No others in the flock were affected. On necropsy the carcass was jaundiced. There was embolic pneumonia with multifocal abscesses. The kidneys were dark in colour but the urine was a normal colour and copper levels were within normal limits. *Staphylococcus aureus* was cultured from multiple organs suggesting a bacteraemia. *Staphylococcus* infections can be found in lambs with tick-borne fever, however PCR tests were negative for *Anaplasma phagocytophilum*.

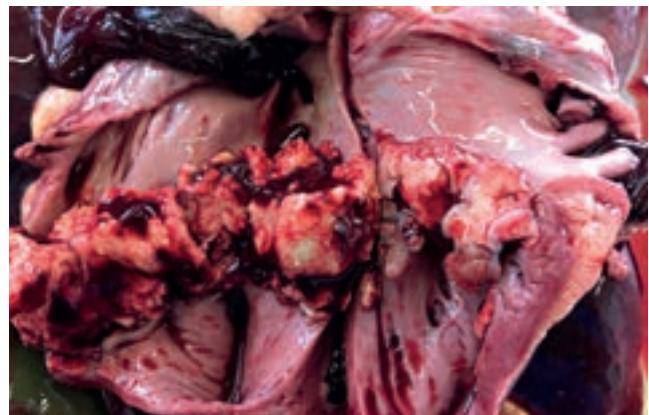


**Figure 7: Embolic pneumonia in a lamb with a jaundiced carcass. Photo: Aideen Kennedy.**

### CARDIOVASCULAR SYSTEM

#### Vegetative endocarditis

A three-month-old lamb was found dead and submitted to Kilkenny. This was the fifth loss from a group of 450. Examination of the heart valves revealed a vegetative endocarditis. The lungs were heavy, congested and oedematous with froth in lower airways. The liver was enlarged and rounded – likely associated with abnormal circulation due to the heart lesions. There were multifocal infarcts with a dark red circumferential rim in both kidneys. Histopathology of the lung revealed marked interstitial pneumonia with multifocal bacterial colonies visible and multifocal septic thrombi, indicating a bacteraemia. There was centrilobular necrosis of the liver, likely due to hypoxia. In addition, there was multifocal suppurative hepatitis. *M. haemolytica* was cultured from multiple organs. A diagnosis of vegetative endocarditis and bacteraemia/septicaemia was made. It was felt this diagnosis may not be representative of the other mortalities in the flock and the submission of additional cases was recommended.



**Figure 8: Vegetative endocarditis in a lamb. Photo: Aideen Kennedy.**

#### Myocarditis and renal infarction

Athlone RVL examined a three-year-old ewe with a history of hindlimb lameness with no response to treatment. Necropsy disclosed a severe diffuse fibrinous pericarditis and multifocal pale areas of the myocardium. The kidneys had large multifocal to coalescing pale yellow, necrotic, raised areas surrounded by a dark rim (diagnosed as renal infarcts). There was bilateral cranioventral congestion and consolidation of approximately 15 per cent of lung parenchyma. The liver had multifocal pale, pinpoint, yellow lesions. Coliforms and *Streptococcus sp.* were isolated from myocardial tissue. Histopathological examination of kidney tissue revealed multifocal to coalescing areas of necrosis. A diagnosis of pericarditis, myocarditis, hepatitis and renal infarction was made. The multi-organ involvement is likely to have occurred subsequent to bacteraemia.

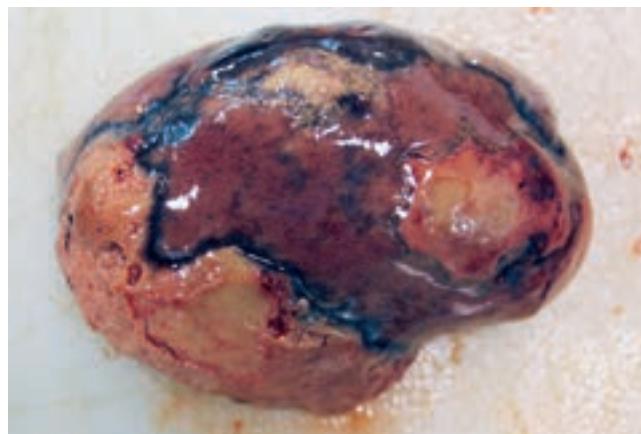


Figure 9: Renal infarcts in a ewe. Photo: Sarah Delaney.



Figure 10: A white nodular mass in a hen, diagnosed as an adenocarcinoma upon histopathology. Photo: Aideen Kennedy.

## MISCELLANEOUS

### Bacteraemia/Septicaemia

A two-month-old lamb with a history of sudden death was submitted to Sligo RVL. Four further deaths had occurred recently on the farm. On necropsy, the lung presented with multifocal randomly distributed abscessation with small abscesses approximately 0.5cm in size. Multifocal random areas of haemorrhage were also present in the lung. There were haemorrhagic abomasal and intestinal contents. *Staphylococcus aureus* was detected in the lung tissue. On histopathology, the lung presented with multifocal subacute interstitial suppurative pneumonia. The most likely cause of death in this case was bacteraemia and sepsis. Bacteraemia involving *S. aureus* spread by ticks (Tick pyaemia) could not be ruled out and was considered likely in this case.

## POULTRY

### Marek's disease

A four-year-old hen with a prolonged history of lethargy was euthanised and submitted to Kilkenny RVL. On examination, the hen was in poor body condition. The thymus was enlarged bilaterally. There was a large firm white nodular mass in the abdominal cavity. The intestines were adhered and there were multiple white foci on the mesentery. The liver was jaundiced. Histopathology confirmed a diagnosis of adenocarcinoma.

## ALPACAS

A six-year-old alpaca was submitted to Kilkenny RVL with a history of sudden death. There was a perforated ulcer affecting the third stomach compartment (C3) with an associated peritonitis. Camelids appear to be particularly sensitive to stress, which may be brought on by a number of stressors. These may be environmental (extremes of, and abrupt changes in, weather), social (due to animal movements or hierarchical issues), or metabolic (due to excessive energy drain) in origin, or secondary to other disease. Camelids are "pseudo-ruminants" and have three stomach compartments referred to as C1, C2 and C3; ulcers most commonly occur in C3, 80 per cent of which is non-glandular and the distal 20 per cent of which is glandular and secretes acid. (Whitehead 2013)



Figure 11: Stomach/gastric ulcer in an alpaca. Photo: Maresa Sheehan.