

Regional Veterinary Laboratories Report

September 2021

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 428 carcasses and 41 fetuses during September 2021. Additionally, 1,703 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 September 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.

AVIAN INFLUENZA ALERT NUMBER 06 OF 2021

Ireland has confirmed Highly Pathogenic Avian Influenza virus subtype (HPAI) H5N1 in a wild bird (Peregrine Falcon - *Falco peregrinus*) in County Galway. This is the first case of Highly Pathogenic Avian Influenza to have been confirmed in a wild bird since February. The bird was submitted as part of the Avian Influenza wild bird surveillance programme to Limerick Regional Veterinary Laboratory, confirmatory testing in the Central Veterinary Research Laboratory confirmed subtype H5N1 on November 3, 2021. Cases of Avian Influenza H5N1 have been reported in wild birds and in poultry in several countries throughout Europe. Flock owners are encouraged to increase biosecurity levels to prevent infection spreading to poultry and captive birds.

CATTLE

Pneumonia and blackleg were the most common diagnoses from necropsy in cattle in the RVLs during September 2021.

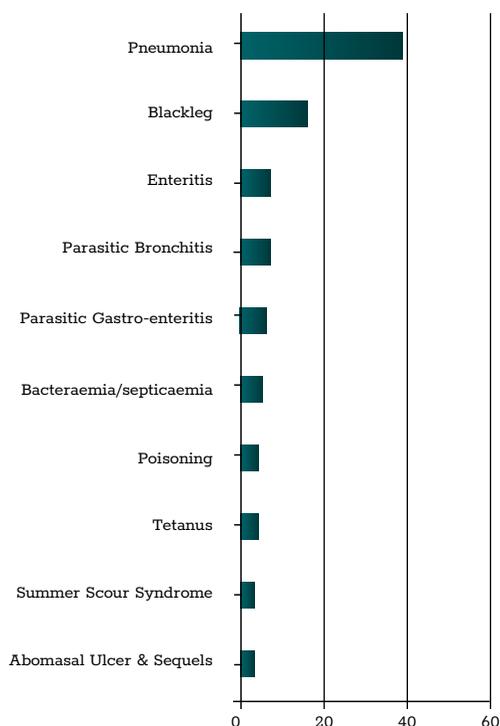


Table 1: The most common diagnoses in cattle submitted for necropsy in September 2021.

GASTROINTESTINAL TRACT

Coccidiosis

A three-month-old calf was submitted to Sligo RVL with history of severe diarrhoea. There had been no response to anthelmintic or antibiotic treatment. The animal had been grazing with a cohort of older spring born calves and no other animal in the group was clinically affected. The calf was two months younger than the other animals in the group. Histopathology of the large intestine in this calf confirmed a severe necrotising enteritis with large numbers of coccidia life stages present in remaining mucosa. This case serves as a reminder that age can be a major factor in the susceptibility of calves to protozoa disease at pasture. The calf was the youngest in the group and was likely exposed to a high infectious dose from clinically unaffected cohort animals.

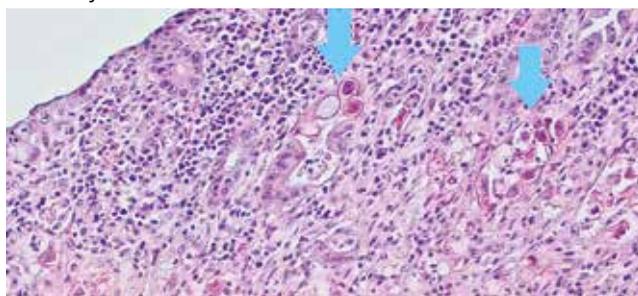


Figure 1: Large intestine mucosa from a three-month-old calf with myriad protozoa life stages (arrows). Photo: Shane McGettrick.

Summer scour syndrome

A five-month-old dairy weanling with history of scouring was submitted to Kilkenny RVL. This was the eighth case from 140 animals. Examination showed an oesophagitis with multifocal-to-coalescing ulcers. The walls of the small intestine were oedematous, and the intestinal contents were very liquid. Gross and histopathological examination suggested a diagnosis of summer scour syndrome. Conditions such as coccidiosis, bovine virus diarrhoea (BVD), salmonellosis and molybdenosis were excluded. The definition of summer scour syndrome is: "Severe, rapid onset diarrhoea and weight loss in weaned dairy calves up to 12 months old, at grass. Occurs within one month of turnout with high morbidity. Routine investigations rule out common parasitic, bacterial and viral

causes. Oral and oesophageal ulceration and necrosis can be a feature in some cases". Grazing of lush grass – usually ryegrass pastures, often recently reseeded – is a common finding. In particular, there seems to be an association between inadequate ruminal development prior to weaning and turnout to grass.

Parasitic gastroenteritis

Parasitic gastroenteritis (PGE) was a frequent diagnosis in first season grazing calves in September. Athlone RVL examined two four- and five-month-old calves with a history of being sick for 24 hours with anorexia and profuse diarrhoea. Both were treated with antibiotics. There was a severe diffuse necrohaemorrhagic abomasitis with markedly thickened mucosa in one calf and intestinal contents and faeces were soft. In the second calf, the abomasal mucosa was thickened, grey and had a 'cobblestone' appearance and, again, intestinal contents and faeces were extremely watery. A very high strongyle egg count (EPG) was found in a faecal sample using the McMaster's test. Histopathology of the abomasum showed diffuse gland hyperplasia and metaplasia with multifocal areas of necrosis, neutrophil infiltration of lamina propria and bacterial proliferation, and cross sections of nematodes were seen. A diagnosis of PGE was made, and advice given to review the anthelmintic control programme on farm.



Figure 2: Parasitic abomasitis. Photo: Denise Murphy.

Inguinal hernia and intestinal strangulation

Athlone RVL examined a three-year-old bull with swollen testicles. It had been treated by the vet but had stopped eating and hadn't passed any faeces in a few days. It had been purchased two months previously. On necropsy, the scrotal sac was markedly swollen; the left testicle appeared normal, and the right side was enlarged from the inguinal ring to the testicle and contained loops of necrotic small bowel. On opening the abdomen, there was a fibrinous peritonitis and a loop of small intestine had descended through the right inguinal ring into the scrotum and become entrapped. A diagnosis of an inguinal hernia with intestinal strangulation was made.



Figure 3: An enlarged scrotal sac (left) which contained loops of necrotic small bowel (right). Photo: Denise Murphy.

RESPIRATORY TRACT

Parasitic bronchitis

Dictyocaulus viviparus, or lungworm, was the most commonly identified aetiological agent in cases of respiratory disease diagnosed at necropsy during September 2021.

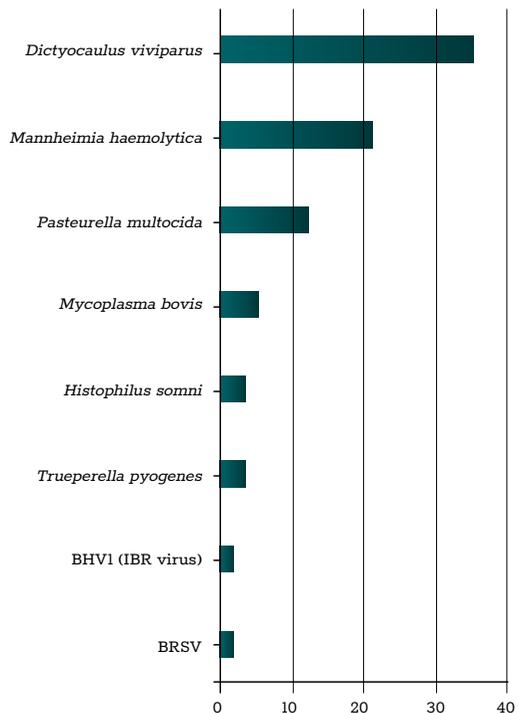


Table 2: The most common aetiologies found in cattle diagnosed with respiratory disease at necropsy in September 2021.

This trend of a rise in cases was reported by multiple RVL locations and highlighted on the Animal Health Surveillance website at <http://www.animalhealthsurveillance.agriculture.gov.ie/>. Warm humid conditions shorten the time required for L1 larvae deposited in faeces to reach the infective L3 stage. The L3 stage can survive longer in humid conditions

and rainfall can help release larvae from faeces deposited throughout the grazing season (either directly through splashing or dispersion caused by explosive projection by the *Pilobolus* fungal sporangium). Treatment of animals with heavy lungworm infestation can be very challenging as the pathology caused by the parasite to the parenchyma is substantial and often is complicated by viral or bacterial concurrent or secondary infections. Close monitoring of the animals, even after the anti-parasitic treatment, is necessary to be able to intervene as soon as bacterial secondary infection might arise.



Figure 4: *Dictyocaulus viviparus* in the trachea of a bovine. Photo: Aideen Kennedy.

From mid-September, Sligo RVL diagnosed cases of parasitic bronchitis due to *D. viviparus* in four bovines. Warm, wet climatic conditions in the Sligo RVL catchment area were considered favourable to the parasite life cycle causing large numbers of the infective L3 stage to be present on pasture grazed by vulnerable stock during this month. Young stock in their first grazing season are particularly vulnerable; however, cases were also diagnosed in older cows and mature stock bulls. In a typical case, a six-month-old calf, which had appeared dull, slightly dyspnoeic and hoarse, presented with a large amount of adult lungworm present in the lower and upper airways. The lung was multifocally consolidated.



Figure 5: Cross-section of *Dictyocaulus viviparus* in the bronchiole of a bovine. Photo: Cosme Sánchez-Miguel.

Athlone RVL examined an 18-month-old heifer with a history of recumbency and weakness since the previous day. There had been two other similar cases in the herd. On necropsy, there was severe, diffuse, subpleural and interlobular emphysema of the lungs bilaterally, with multifocal areas of consolidation and multifocal yellow coloured pinpoint areas on cross-section. Lungworm were not seen on gross examination of the trachea, bronchi, or bronchial tree. The Baermann technique was performed on macerated lung parenchyma and lungworm larvae were detected. Histopathological examination revealed a marked, multifocal, eosinophilic, interstitial pneumonia and pleuritis, with multifocal hyaline membrane formation and type 2 epithelialisation, and cross-sections of parasitic structures seen. A diagnosis of parasitic pneumonia (lungworm) was made.



Figure 6: *Dictyocaulus viviparus* in the airways of a bovine. Photo: Aoife Coleman.

Limerick RVL diagnosed lungworm infections in animals from five herds. Concurrent PGE was present in several cases. While animals affected were usually born in the spring of 2021, at least one adult heifer was diagnosed with this condition.

Pneumonia

A six-month-old calf which had reportedly significantly poor thrive, but no other clinical symptoms was submitted to Sligo RVL. On necropsy, there was bilateral pulmonary abscessation and pleuritis. *Pasteurella multocida* was cultured from the lesions. Moreover, *Anaplasma phagocytophylum* was detected by polymerase chain reaction (PCR). Histopathology revealed diffuse, chronic, severe, suppurative pneumonia and pleuritis with multifocal abscessation. *A. phagocytophylum* is the causative pathogen of tick-borne fever, which has been described as immunosuppressive. A diagnosis of bacterial pleuropneumonia with pulmonary abscessation and concurrent tick-borne fever was made.



Figure 7: Pulmonary abscessation. Photo: Rebecca Froehlich-Kelly.

A two-month-old calf was presented to Kilkenny RVL with a history of respiratory signs. There had been two additional losses on the holding. There was a severe pneumonia with cranio-ventral consolidation affecting approximately 70 per cent of the lungs. There were multiple pinpoint white foci throughout the consolidated area. There were multifocal areas of atelectasis and bulla formation affecting the caudal lungs. On histopathology, there was a chronic/active, multifocal-to-coalescing, severe suppurative bronchopneumonia with foci of caseous necrosis. The changes are consistent with bacterial pneumonia, a role for *Mycoplasma bovis* was suspected. *Mannheimia haemolytica* and *Mycoplasma bovis* were detected from the lungs. A review of respiratory disease control was recommended.

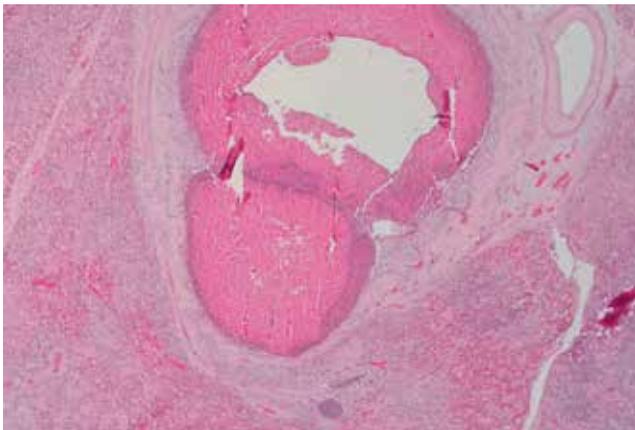


Figure 8: Focal area of caseous necrosis in the lungs of a calf consistent with *Mycoplasma bovis* pneumonia. Photo: Maresa Sheehan.

A seven-month-old weanling was found dead having displayed no symptoms and submitted to Kilkenny RVL. The carcass was in an advanced state of autolysis which impaired examination. There was, however, evidence of a necrotic laryngitis with a large, approximately 5cm polyp-like structure that was partially obstructing the trachea lumen. *Trueperella pyogenes* and *Bibersteinia trehalosi* were cultured from the necrotic lesion.

NERVOUS SYSTEM

Cerebrocortical necrosis

A Friesian heifer weanling was submitted to Limerick RVL, with a history of blindness and progressive recumbency. Another weanling died following similar signs six weeks previously. Examination of the brain with an ultra-violet lamp showed areas of autofluorescence, suggestive of cerebrocortical necrosis (CCN). Histopathology disclosed lesions of laminar necrosis in the sections of cerebrum examined. A diagnosis of CCN was made.

MUSCULOSKELETAL

Clostridial myositis

September 2021 was marked by a rise of clostridial myositis (blackleg) cases in Sligo RVL. Six cases across all ages and groups have been recorded. The most common causative pathogen *Clostridium chauvoei*, and the more unusual *Clostridium septicum* (the causative pathogen of 'false blackleg') were detected by fluorescent antibody technique (FAT) from necrotic myositis lesions. The typical lesions are usually located in the large muscle groups of the rump and neck but may also be found on occasion in the muscular part of the diaphragm, the tongue, and the heart muscle, and are usually accompanied by a typical sweet smell. Pericarditis is also often present.



Figure 9: Clostridial myositis (blackleg) lesions in a weanling. Photo: Sarah Delaney.

Athlone RVL examined a seven-month-old weanling with a history of hindlimb lameness, followed by death within hours of first presenting with clinical signs. The carcass was diffusely haemorrhagic. There was multifocal-to-coalescing dark (almost black), dry, necrohaemorrhagic lesions in both hindlimb muscles with palpable crepitus and a sweet odour. A similar focal lesion was present in the myocardium and there was a marked fibrinous exudate within the pericardial sac. *C. chauvoei* was detected by FAT, and *Clostridium spp.* were isolated on culture. Histopathology revealed a marked, acute, multifocal suppurative myositis with oedema and intralesional bacteria. A diagnosis of clostridial myositis (blackleg) was made. Vaccination of cohorts with a multivalent clostridial vaccine was recommended.

MISCELLANEOUS

Athlone RVL examined a two-year-old heifer with a history of

chronic laryngitis, inappetence, and weight loss. There had been no response to treatment, and she was euthanised. Necropsy disclosed a very large, firm, focally extensive mass in the left cranial lung lobe approximately 40cm in diameter, and there were multifocal round, firm lesions of varying size up to 8cm randomly distributed throughout the lung parenchyma. Mediastinal, bronchial and submandibular lymph nodes were markedly enlarged and had a firm consistency. There was a large, firm, focally extensive mass extending into and occluding the larynx. There were two circular pale-yellow lesions in the kidney cortex. Histopathological examination of the lesions revealed a poorly differentiated metastatic tumour, possibly neuro-endocrine in origin. A diagnosis of metastatic neoplasia was made.



Figure 10: A large, firm, focally extensive mass in the left lung (left) and multifocal round, firm lesions randomly distributed throughout lung parenchyma (right). Photo: Sarah Delaney.

Malignant catarrhal fever

An 11-year-old imported cow was submitted to Sligo RVL with a history of high temperature and pain. On gross examination, the cow had a reddened nasal planum, multifocal granulated chronic ulcers on outer surface of lower gums. The carcass was jaundiced, and the liver was orange, enlarged with rounded edges, and had a pulpy texture. The caecal wall was thickened, and the lumen contained bloody ingesta. There was bloody urine. There was diffuse interlobular and occasional bullous emphysema in lungs with multifocal haemorrhages in lung and kidney parenchyma. Histopathology confirmed a severe lymphocytic proliferative vasculitis in multiple organs consistent with malignant catarrhal fever (MCF). Ovine herpesvirus 2, the causative organism of MCF, was detected by PCR confirming the condition. Interestingly, there were no sheep present on the farm and there had been no recent contact with sheep that are considered the reservoir host for this virus. It is likely that the virus must have spread from an adjacent farm or via fomites.

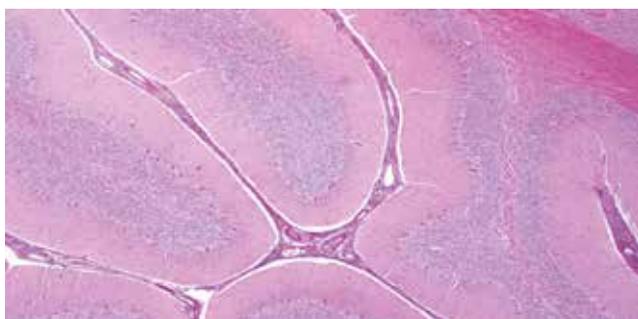


Figure 11: Lymphocytic meningitis and vasculitis in the cerebellum of a cow with MCF. Photo: Shane McGettrick.

Listeriosis

Sligo RVL examined the carcass of a four-month-old calf which had displayed a high temperature and dyspnoea before death. On necropsy, there was diffuse chronic-active fibrinous pericarditis and a focally extensive splenic necrosis suggestive of bacteraemia. There was diffuse haemorrhagic terminal pulmonary oedema. DNA specific to *A. phagocytophylum* was detected in this animal ('tickborne fever') and *Listeria monocytogenes* was also cultured systemically. Systemic listeriosis is the most likely cause of death in this case. Tickborne fever has been reported as immunosuppressive and can render animals more susceptible to infections, particularly other pathogens like *Babesia* or *Staphylococcus aureus* that have been inoculated simultaneously by the tick or ticks.

SHEEP

Parasitic gastro-enteritis and bacteraemia/septicaemia were the most common diagnoses from necropsy in sheep in the RVLs during September 2021.

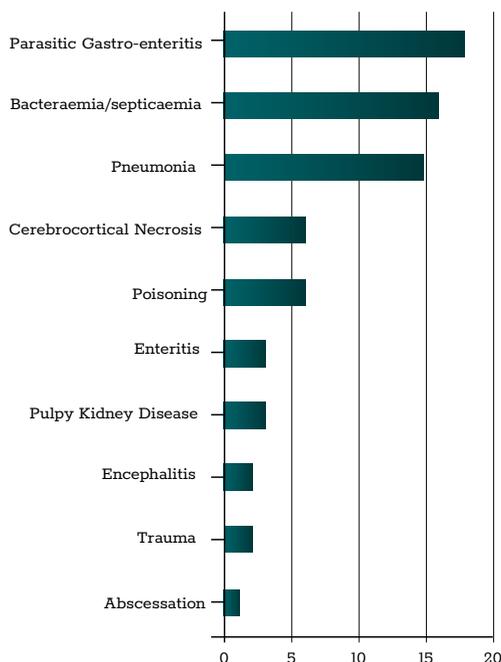


Table 3: The most common diagnoses in sheep submitted for necropsy in September 2021.

GASTROINTESTINAL TRACT

Parasitic gastro-enteritis

Athlone RVL examined two five-month-old lambs with a history of ill-thrift, weight loss and diarrhoea. There had been six losses in the flock. On gross post-mortem examination, there were similar findings in both lambs; the perineal area was faecal-stained. The intestinal contents were very liquid, in particular the large intestinal contents. Faecal samples were collected from both lambs for examination. There was an extremely high strongyle egg count detected (16,000 and 1,400 eggs per gram). On histopathological examination, there was a marked, multifocal eosinophilic enteritis. A diagnosis of parasitic gastroenteritis was made.

RESPIRATORY TRACT

Systemic pasteurellosis

Athlone RVL examined three five-month-old lambs with a history of inappetence, diarrhoea and sudden death. There had been seven similar losses in the flock. On gross post-mortem examination, there were similar findings in all three lambs examined. There was a severe, diffuse, fibrinopurulent pleuritis with an abundant quantity of purulent fluid in the pleural cavity. There was severe, bilateral congestion and consolidation affecting varying percentages of the lung parenchyma; the most severe lesion affected approximately 70-80 per cent of lung parenchyma. In one lamb, there were multifocal-to-coalescing necrotic lesions in the proximal oesophagus. PCR detected *B. trehalosi* in the lungs. Histopathology of the lungs revealed a marked, multifocal, acute, suppurative bronchopneumonia and pleuritis, with intralesional bacteria. A diagnosis of pasteurellosis, in both respiratory and systemic forms, was made. *B. trehalosi* is most often associated with the systemic or septicaemic form of pasteurellosis affecting lambs. *P. multocida* and *M. haemolytica* are bacteria from the same family, *Pasteurellaceae*, and are most commonly associated with pneumonic pasteurellosis, the respiratory form of pasteurellosis.



Figure 12: A ventral view of pleuritis in a lamb, after removal of the sternum. Photo: Sarah Delaney.

Athlone examined a four-month-old lamb with a history of sudden death. There had been four or five similar losses over the previous two weeks; the lambs had been purchased from different flocks. There were multifocal small areas of ulceration and necrosis at the base of the tongue and pharyngeal mucosa. There was marked pulmonary congestion, and the liver and kidneys were autolysed. Histopathology of the lung showed multifocal areas of necrotising and lymphocytic interstitial pneumonia with bacterial colony aggregation, typical of systemic pasteurellosis. *B. trehalosi* was detected in the oral lesions and lungs by PCR. A diagnosis of systemic pasteurellosis due to *B. trehalosi* was made.

A five-month-old Texel lamb which had been found dead was submitted to Sligo RVL for post-mortem examination. The lamb was in fair condition and was well preserved, but anaemic and dehydrated. There was a locally extensive pharyngeal haemorrhage associated with erosion and rupture of an artery in a cellulitis lesion. These lesions usually arise after mechanical perforation of the pharyngeal mucosa ('dosing gun Injuries'); however, *B. trehalosi* was isolated from the lesions in this case.

Ulceration of the distal pharynx and oesophagus are occasional findings in sheep with septicaemia due to *B. trehalosi*. This organism may be present in tonsils and can cause systemic disease at times of stress. Weaned lambs are frequently affected. The oral lesions are important differential diagnoses for reportable vesicular diseases, but similar lesion may be caused by parapoxvirus ('orf') or trauma.



Figure 13: Multifocal small areas of ulceration and necrosis at the base of the tongue in a case of systemic *B. trehalosi* infection. Photo: Denise Murphy.

NERVOUS SYSTEM

Listerial encephalitis

Athlone RVL examined a one-year-old hogget with a history of recumbency and frothing from the mouth for several days; it was treated but didn't respond. On necropsy, the abomasal mucosa was thickened and both small and large intestinal contents were very liquid but the faeces was relatively normal. There was thickened bile in the gall bladder indicative of recent inappetence. A strongyle egg count of 7,200 EPG was detected in the faeces. Histopathology of the brain showed perivascular lymphocyte cuffing and microabscessation in sections of spinal cord, medulla and midbrain consistent with encephalitis due to *Listeria sp.*; a parasitic abomasitis was also observed. A diagnosis of listerial encephalitis/listeriosis and parasitic gastroenteritis was made.

Sligo RVL diagnosed listerial encephalitis in a six-month-old lamb which had been found dead. There were no significant lesions visible on gross post-mortem examination. Histopathology revealed multifocal, acute, severe, suppurative meningoencephalitis, predominantly in the hind brain. Perivascular cuffing and multifocal micro-abscessation were present. *L. monocytogenes* was confirmed by bacterial culture from brain tissue.

POISONINGS

Plant poisoning

Sligo RVL diagnosed plant poisoning as cause of death in sheep in several cases in the month of September. The most commonly involved plants in these cases were the ornamental shrubs *Pieris japonica*, Cherry laurel and *Rhododendron*. The histories in most cases throughout the year involved animals breaking into gardens or accidental and unintentional exposure to garden hedge-cuttings. Most commonly, sudden death is the main feature with symptoms like swaying, being dull or lethargic, and grinding teeth being reported occasionally.