

Regional Veterinary Laboratories Report

August 2021

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 294 carcasses and 35 fetuses during August 2021. Additionally, 1,323 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 August 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 blackleg were the most common diagnoses from necropsy in cattle in the RVLs during August 2021.

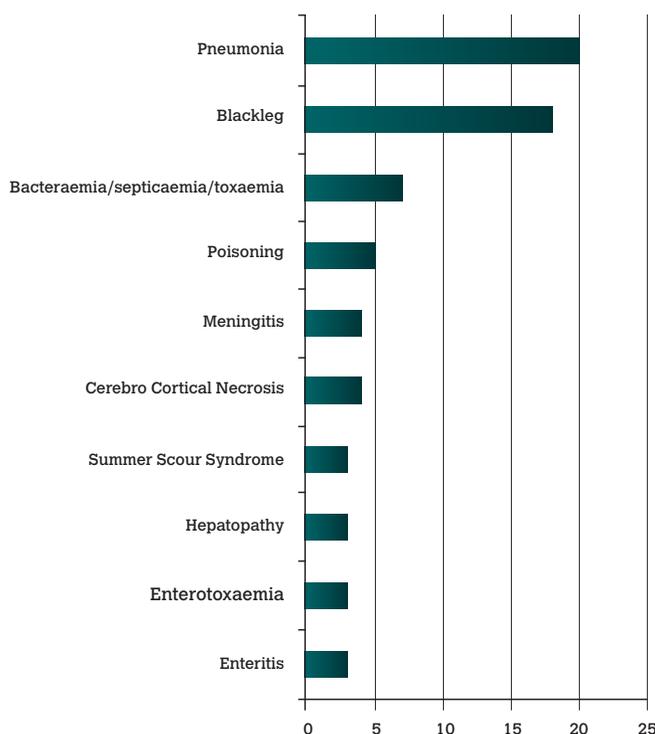


Table 1: The most common diagnoses in cattle submitted for necropsy in August 2021

GASTROINTESTINAL TRACT

Haemorrhagic abomasal ulcers

A five-month-old weanling was found dead and submitted to Kilkenny RVL. Findings on necropsy included pale mucous membranes, and the lungs were pale in colour. The abomasum contained a large blood clot and on the mucosal surface of the abomasum there were multifocal deep ulcers. There was an exposed blood vessel visible in one of the deep ulcers and this was the likely source of haemorrhage. On histopathology, there was a fibrino-suppurative abomasitis with multifocal bacterial colonies visible. A diagnosis of abomasal ulceration and haemorrhage was made.



Figure 1: Multifocal abomasal ulceration with exposed blood vessel, leading to (inset) abomasal haemorrhage. Photo: Aideen Kennedy.

Traumatic reticulo-peritonitis

Athlone examined a three-year-old cow with a history of sickness of 10 days' duration consisting of recumbency, anorexia, and ultimately death despite treatment. On gross necropsy, there was a diffuse fibrinopurulent 'bread-and-butter' peritonitis with adhesions between loops of intestines, and the forestomachs were adherent to the diaphragm. A 10cm long piece of wire (suspected to be fencing wire) was found in the reticulum. The heart and lungs were unremarkable. A diagnosis of traumatic reticuloperitonitis or hardware disease was made.

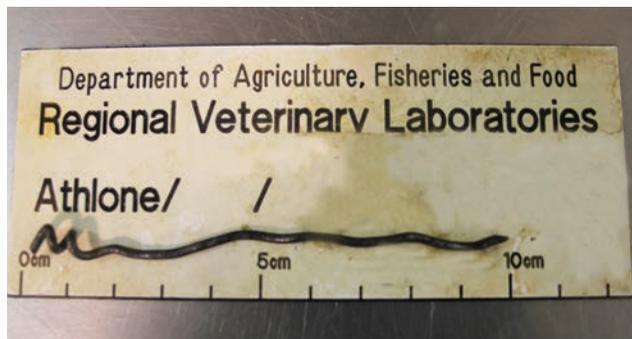


Figure 2: A wire found in the reticulum of an animal with traumatic reticuloperitonitis. Photo: Denise Murphy.

RESPIRATORY TRACT

Pneumonia

A 23-day-old calf, one of three deaths on the holding, was submitted to Kilkenny RVL for post-mortem examination. There was a severe fibrinous pleuropneumonia affecting both the left and right lungs; the lesions affected a large proportion of both lungs. There was a fibrinous pericarditis. There was a poor quality milk clot in the abomasum suggesting poor appetite. *Mannheimia haemolytica* was isolated from the lungs and liver. On histopathology, there was a severe fibrino-suppurative pleuropneumonia. Observed in the liver was a marked sinusoidal leucocytosis and increased numbers of inflammatory cells, mainly lymphocytes, in the portal areas; and a moderate hepatitis. A diagnosis of pneumonia and bacteraemia associated with the isolation of *M. haemolytica* was made. A review of respiratory disease control in the herd was recommended.



Figure 3: Fibrinous pleuropneumonia. Photo: Maresa Sheehan.

Parasitic bronchitis and pneumonia

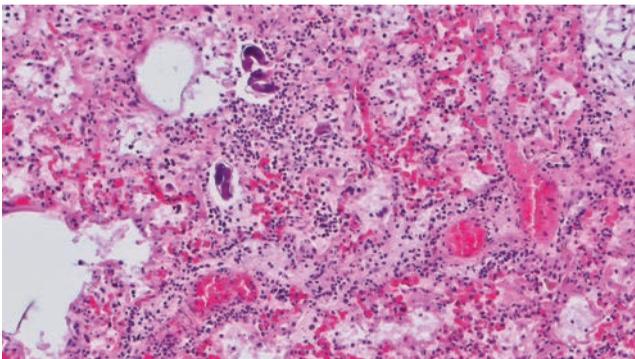


Figure 4: Severe chronic broncho-interstitial pneumonia with *Dictyocaulus viviparus* larvae. Photo: Shane McGettrick.

Sligo RVL diagnosed patent parasitic pneumonia with concurrent respiratory syncytial virus (RSV) infection in a 16-month-old bull with a history of acute respiratory distress. The smaller airways were packed with plugs of writhing nematodes and frank blood clots. Higher airways contained fewer nematodes but larger blood clots and frothy purulent mucous clots. Ribonucleic acid (RNA) specific to RSV was also detected in the lesions by polymerase chain reaction

(PCR) technique. Experiments in the past have shown that calves infected with RSV virus and exposed to *Dictyocaulus viviparus* develop more serious pathology than those exposed only to the lungworm.



Figure 5: Nematode plugs and blood clots in the bronchiole of a bull. Photo: Colm Ó Muireagain.

A four-year-old suckler cow was submitted to Sligo RVL with a history of respiratory distress. At necropsy, there was severe bullous emphysema and large numbers of lungworm were present in airways. Histopathology confirmed a severe eosinophilic chronic broncho-interstitial pneumonia with large numbers of nematode larvae present. Severe parasitic pneumonia in older animals is relatively unusual but should remain a differential diagnosis for respiratory disease in all ages of animal. It is considered likely that this cow was exposed to a large infectious dose of lungworm larvae at pasture due to build-up throughout the grazing season, combined with favourable wet warm weather which accelerated the development of infective larvae on pasture. Older cattle are often not included in worm control programmes on farms that have not previously experienced significant disease in this age group.



Figure 6: *Dictyocaulus viviparus* in airways of a four-year-old suckler cow. Photo: Shane McGettrick.

Parasitic bronchitis/Infectious bovine rhinotracheitis

A five-year-old Friesian cow from an 80-cow dairy herd was submitted to Limerick RVL; there had been four previous deaths. There was a history of coughing in the group 10 days previously. The animals had improved when treated with anthelmintics but three days later some cows showed severe respiratory distress with high temperatures. Infectious bovine rhinotracheitis (IBR) was suspected and vaccination of the herd for this condition initiated. Severe fibrinous,

haemorrhagic laryngitis, tracheitis and bronchitis was discovered at necropsy; there was a lobar type pneumonia with emphysema. Some lungworm larvae were seen in the airways. The gross findings were strongly suggestive of acute IBR and concurrent parasitic pneumonia. PCR result for bovine herpesvirus type 1 (BHV1), the causative organism of IBR, was inconclusive. A separate submission from another cow (sent to Cork RVL) was positive on PCR for BHV1. The stress caused by the lungworm infection may have been a contributing factor to triggering the acute IBR outbreak in this herd.



Figure 7: Severe fibrinous tracheitis typical of infectious bovine rhinotracheitis (IBR). Photo: Alan Johnson.

URINARY/REPRODUCTIVE TRACT

Renal tubular necrosis

Athlone RVL examined a three-month-old calf with a history of diarrhoea and weight loss over the previous week, with no response to treatment. On necropsy, there was moderate dehydration; both kidneys were enlarged, and the renal cortices were diffusely very pale with a firm consistency. A sample of vitreous humour was taken for analysis; the urea concentration was 54.83mmol/L. Levels of urea in vitreous humour greater than 7.3mmol/L in ruminants are consistent with renal disease, but histopathology is essential for a definitive diagnosis of a nephropathy. Histopathology of the kidney revealed severe tubular necrosis. A diagnosis of renal tubular necrosis was made. The differential diagnosis for renal tubular necrosis includes oak/acorn toxicity, antibiotic toxicity, NSAID toxicity, heavy metal toxicity, mycotoxins or ischaemia following hypotension.

CARDIOVASCULAR SYSTEM

Vegetative endocarditis

Sligo RVL examined an 18-month-old heifer which had been observed lame approximately one month before death, then becoming anorexic and recumbent; there was no improvement upon treatment. On post-mortem examination of the heart, which was enlarged, there was a vegetative endocarditis on the pulmonary valve. There was pleural and pericardial effusion, the lungs were oedematous, and the liver presented with a 'nutmeg' pattern. There was

extensive abomasal fold oedema. There were subcutaneous petechiae around head and neck. *Streptococcus uberis* was cultured from the heart lesion. Congestive heart failure and septicaemia due to endocarditis were diagnosed.



Figures 8 and 9: Abomasal fold oedema (top) and the characteristic 'nutmeg' pattern on the cut surface of the liver, which is associated with passive venous congestion (bottom) in a case of congestive heart failure. Photos: Rebecca Froehlich-Kelly.

Vena caval thrombosis

A two-year-old Limousin bull was submitted to Kilkenny RVL, which had not been thriving and had failed to respond to antibiotic treatment. Examination of the lungs showed embolic pneumonia with multifocal purulent foci. The liver was autolysed but contained multifocal foci of abscessation, and there was a thrombus in the vena cava. A diagnosis of vena caval thrombosis was made. The culture results were sterile, likely due to the recent antibiotic use. The most common cause of vena caval thrombosis is historic ruminal acidosis leading to rumenitis, allowing bacteria to escape into the portal circulation through the compromised mucosa. The bacterial emboli may then cause subsequent hepatic abscessation. If a hepatic abscess intrudes into the vena cava, thrombosis within the vessel is a common sequel which may in turn cause lung abscessation due to localisation of septic emboli in the pulmonary vasculature.

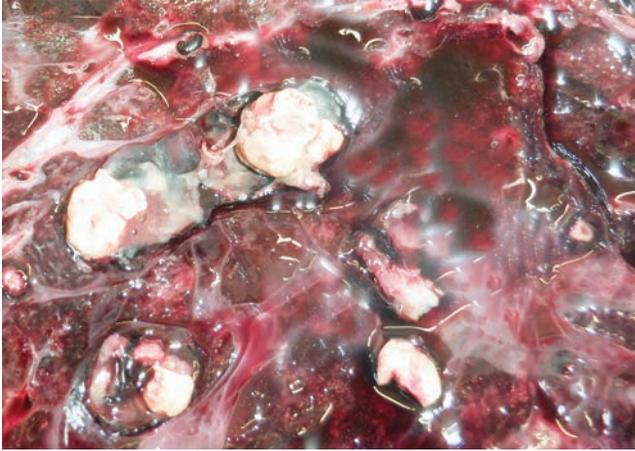


Figure 10: Embolic pneumonia, a sequel to a case of vena cava thrombosis. Photo: Aideen Kennedy.

NERVOUS SYSTEM

Necrotising meningitis and encephalitis

Sligo RVL diagnosed acute necrotising meningitis and encephalitis in a two-and-a-half-week-old calf that had been hot-iron de-budded a few days previously. The necrotic tissue was infected with *Staphylococcus aureus* bacteria and there was a terminal bacteraemia and sepsis. Hot-iron de-budding has been frequently associated with necrotising encephalitis, especially in thin-skulled animals. It is reported more frequently in goats. Disbudding protocols and technique on the farm should be reviewed to ensure animal welfare is not compromised during this routine procedure.



Figure 11: Necrotising meningitis in a calf that was injured during de-budding. Photo: Colm O Muireageán.

Cerebro-cortical necrosis

Athlone RVL examined an 18-month-old heifer with a history of neurological signs since the previous day with no response to treatment. On gross examination, there was flattening and yellowing of the gyri of the cerebral hemispheres, and there were multifocal areas of fluorescence under ultraviolet light. Histopathological examination of the cerebrum revealed marked, diffuse, laminar cortical necrosis with vacuolation. A diagnosis of cerebrocortical necrosis (CCN) was made. CCN is associated with diets deficient in thiamine or that contain excess sulphur as well as some other less common causes.

MUSCULOSKELETAL

Blackleg (Clostridial Myositis)

Two six-month-old weanlings were submitted to Kilkenny RVL with a query of CCN as there had been a number of CCN cases on the farm a few weeks previously that had been responsive to Vitamin B treatment. On examination, both weanlings were in an advanced state of autolysis. Both had a fibrinous pleuritis and pericarditis. One weanling also had multifocal areas of dry necrotic emphysematous myositis affecting the cervical and dorsal skeletal muscle. There were also black lesions of myositis in the tongue. Both animals recorded positive *Clostridium chauvoei* fluorescent antibody technique (FAT) results and a diagnosis of blackleg was made; a review of vaccination was recommended.



Figure 12: Acute fibrinous pericarditis in an animal with blackleg. Photo: Aideen Kennedy.

Athlone RVL examined a four-month-old Charolais-cross weanling that had been "noticed that morning with a swollen, spongy neck" and died following treatment. A comrade had been found dead but was too autolysed for necropsy. There was marked subcutaneous haemorrhage, crepitus and oedema and diffuse dry, haemorrhagic, myositis lesions bilaterally in the neck muscles. There was fibrino-haemorrhagic pleuritis in the right apical lung lobe and fibrinous pericarditis with focally extensive haemorrhagic lesions in the left and right ventricular myocardium. *C. chauvoei* was detected in smears of the affected muscle by FAT. A diagnosis of clostridial myositis or blackleg was made and advice regarding the vaccination of comrades with a multivalent clostridial vaccine was given.

POISONINGS/ MISCELLANEOUS CASES

Chronic toxic hepatopathy

An 18-month-old Friesian bullock from a calf to beef system was submitted to Limerick RVL with a history of ill-thrift. Two other animals had already died in the group. Moderate diffuse oedema of the abomasal mucosa was discovered at necropsy. Pulmonary oedema and watery intestinal contents were also found. The liver was very firm and pale, suggestive of a chronic toxic hepatopathy. Histopathology found lesions of bile duct hyperplasia, diffuse fibrosis and megalocytosis in the liver. These lesions are consistent with chronic toxic hepatopathy, the most common causes of which are ragwort (*Senecio jacobea*) and aflatoxin poisoning.

Lymphoma

An eight-year-old cow which had a history of being sick for six weeks prior to death was submitted to Sligo RVL. She had initially presented with an ocular discharge which was unresponsive to treatment and developed anorexia and dyspnoea. At post-mortem examination, the lung presented with multifocal, randomly distributed white to yellow consolidated well demarcated raised masses varying from 1cm to 20cm in size. The mediastinal lymph node was severely enlarged and were of similar consistency to the masses present in the lung parenchyma. On the left kidney, there was a similar 1cm-diameter sized raised white mass. The anterior chamber of the eye contained a similar white mass adherent to the iris and involving adjacent uvea that had distorted the globe. Histopathology of the lesions revealed neoplastic round cells with scant cytoplasm arranged in sheets. There was mild anisocytosis and anisokaryosis. A metastatic round cell tumour likely to be a lymphosarcoma was diagnosed. A PCR confirmed that Bovine Leukaemia virus, the aetiological agent for enzootic bovine leukosis, was not present. Bovine Leukaemia virus has not been detected in Ireland but is responsible for adult-onset lymphoma in cattle worldwide necessitating continued surveillance for introduction of the disease in cases such as this.



Figure 13: Diffuse white to yellow metastases in the case of lymphoma in a cow. Photo: Rebecca Froehlich-Kelly.

SHEEP

Pneumonia and bacteraemia/septicaemia were the most common diagnoses from the necropsy of sheep in the RVLs during August 2021.

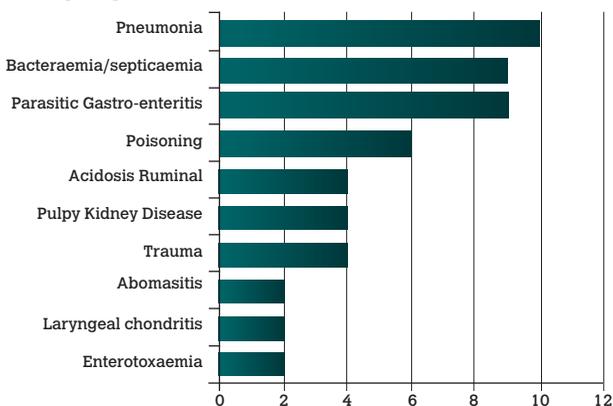


Table 2: The most common diagnoses in sheep submitted for necropsy in August 2021.

GASTROINTESTINAL TRACT

Clostridial enterotoxaemia

Athlone RVL examined a one-year-old hogget with a history of sudden death; there had been one other case in the flock. On gross post-mortem examination, there was a large fibrin clot and a marked quantity of clear exudate in the pericardial sac. The kidneys had a soft consistency and were autolysed. Intestinal contents were liquid. Alpha and epsilon toxins of *Clostridium perfringens* were detected in the intestinal contents of this hogget, confirming the presence of *C. perfringens* Type D. Histopathological examination of the brain revealed a large number of blood vessels in the cerebellum and cerebrum surrounded by fluid, or 'serum lakes'. This is suggestive of a vasculopathy and is associated with epsilon toxin. A diagnosis of *C. perfringens* Type D enterotoxaemia, or pulpy kidney disease was made and the vaccination of cohorts with a multivalent clostridial vaccine was advised.

RESPIRATORY TRACT

Necrotising pharyngitis

A lamb was submitted to Kilkenny RVL for necropsy. There was a history of coughing in the flock and there had been one other death. On gross examination, there was a bilateral severe necrotising pharyngitis. There was cranio-ventral consolidation of the lungs, and pulmonary congestion. On histopathological investigation, there was a severe, multifocal-to-coalescing, fibrino-suppurative bronchopneumonia with intra-lesional bacteria and leucocytoclasia; and a severe, necrotising, fibrino-suppurative pharyngitis with intra-lesional bacteria. *Bibersteinia trehalosi* was isolated from the pharynx and lungs. The changes in the lungs and pharynx and the isolation of *B. trehalosi* are consistent. A review of *Pasteurella* disease control was recommended.

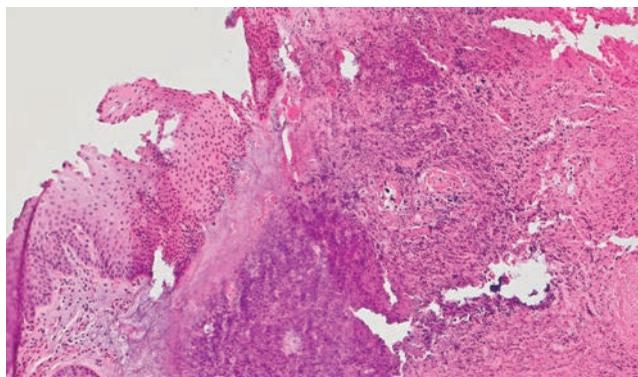


Figure 14: Severe, necrotising, fibrino-suppurative pharyngitis in a lamb. Photo: Maresa Sheehan.

Laryngeal chondrites

Sligo RVL received a two-year-old Texel ram which had presented with heavy breathing before death and died despite treatment efforts. On necropsy, the larynx was obstructed by soft tissue swelling over the arytenoid cartilage (Figure 15). A cavity in the arytenoid contained pus and necrotic material on incision. There was no pneumonia present. *Trueperella pyogenes* was cultured from the lesion. Laryngeal chondritis, also known as 'Texel throat', was diagnosed in this case.

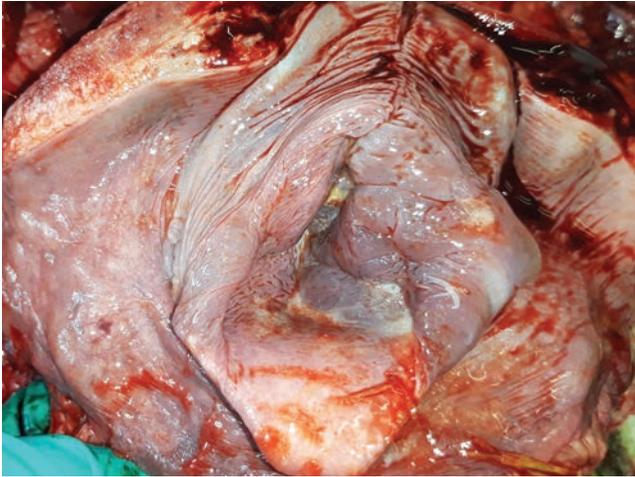


Figure 15: Soft tissue swelling in a case of 'Texel throat' in a ram. Photo: Rebecca Froehlich-Kelly.

Pneumonia, pleuritis, pericarditis

Two five-year-old rams were submitted to Sligo RVL from the same flock, following a brief course of dullness and apparent anorexia. One of the rams was described as having "gurgling" respiratory sounds. Both rams had died in the same field having been recently moved in order to build body condition prior to the breeding season. In one of the rams, there was a severe fibrinous pleuritis and pericarditis with the right side more affected. The other ram had a more chronic fibrinous, cranio-ventrally distributed bronchopneumonia with multifocal pale areas dispersed over the remaining lung. In the same ram, there were also multifocal, firm, pale, slightly raised, irregular fibrosed areas in the liver. Ascites was not a feature in either animal. Histopathology confirmed a severe acute suppurative bronchopneumonia typical of *M. haemolytica* in one of the rams and chronic broncho-interstitial pneumonia in the other. There was concurrent chronic liver disease due to *Fasciola hepatica* that was considered the likely cause of the gross liver lesions. *Mycoplasma ovipneumoniae* was detected by PCR in the more chronically affected animal while *B. trehalosi* was detected in the other more acutely affected sheep. *M. ovipneumoniae* is a significant cause of pneumonia in growing lambs but may be present as part of a multifactorial pneumonia in sheep of any age. Identification of other agents may have been affected by antibiotic treatment. The cause of death in both rams was respiratory disease that was likely to have been exacerbated by the stress of movement and changes to nutrition in the days preceding its death.



Figure 16: Acute fibrinous pleuritis in a five-year-old ram. Photo: Shane McGettrick.

MUSCULO-SKELETAL

Athlone RVL examined a three-year-old ewe with a history of dullness, which was not treated and was found dead the next evening. She had been recently shorn and the skin on the dorsum was thin, with dark grey necrotic skin lesions and some superficial lacerations. There was extensive subcutaneous cellulitis and necrosis extending along fascial planes into underlying musculature with foul-smelling pus. The necrosis extended from the right shoulder area along the right ribcage and flank and also along the dorsum. The liver was enlarged, and the other viscera were unremarkable. Coliforms and *Streptococcus spp.* were isolated from the cellulitis lesion. A diagnosis of suppurative necrotic cellulitis was made and it was suggested that it was likely to have been secondary to a skin puncture or injection site.



Figure 17: Suppurative cellulitis in a recently shorn ewe. Photo: Denise Murphy.

POISONINGS/ MISCELLANEOUS CASES

A ram was submitted to Kilkenny RVL that had been found dead with no clinical signs noted. Findings included fractures to the skull with a large blood clot noted between the brain and the calvarium. Trauma was considered a likely possibility for the lesions, as aggression between rams is common as the breeding season approaches.