



Northern Ireland Disease Surveillance Report, January to March 2021

- Jejunal haemorrhage syndrome in a cow
- Listerial encephalitis in a heifer
- Vena caval thrombosis in a cow
- Necrobacillosis in a lamb
- Septicaemic pasteurellosis in lambs
- Urolithiasis in lambs
- Tuberculosis (TB) in alpacas
- Cystinuria in a maned wolf

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for January to March 2021

CATTLE:

Respiratory diseases

Pasteurellosis due to *Mannheimia haemolytica* or *Pasteurella multocida* was the most common cause of bovine pneumonia during the reporting period, *Trueperella pyogenes* infections were also prominent.

Pneumonia due to *Mycoplasma bovis* and IBRV infection was diagnosed on full post mortem examination of a seven-month-old bull. On gross examination there was deep purple consolidation of the anteroventral and cardiac lung lobes on the left side with around 10% of the lung field affected; the remaining parenchyma showed emphysematous bullae. Histological examination showed marked bronchiolitis and bronchitis with epithelial hydropic change and necrosis, there was acute inflammatory exudate in the airways. Some peri-bronchiolar lesions showed early caseous necrosis. There was emphysema and fibrin expansion of the inter-lobular septae, alveolar oedema and leucocytic aggregation in the airspaces with pneumocyte necrosis. IBRV antigen was detected by IFAT and IBRV nucleic acid was detected by RT-PCR. These findings were interpreted with caution however because the history indicated that a live intra-nasal IBR vaccine had been used a few days previously (and hence vaccine antigen and nucleic acid may have been detected). Infectious bovine rhino tracheitis was therefore confirmed by virus isolation and histology. *Mycoplasma bovis* nucleic acid was detected in the lung tissue by RT-PCR and again histological examination was used to characterize the lesion.

Pasteurellosis

Septicaemia and pneumonia due to *M. haemolytica* was diagnosed in a one-month-old calf. At necropsy there was diffuse fibrino-suppurative peritonitis, pleurisy, pericarditis and epicarditis. There were multifocal red-black lobular areas of haemorrhage and necrosis in the lungs. *M. haemolytica* was recovered from multiple tissues.

Alimentary diseases

Jejunal haemorrhage syndrome

Jejunal haemorrhage syndrome (JHS) was diagnosed in a three-year-old dairy cow, one of two cases recorded as noteworthy during the reporting period. On gross examination approximately six feet of the jejunum was markedly hyperaemic and on incision was found to be distended with blood clot which had formed a functional obstruction. The findings were considered consistent with jejunal haemorrhage syndrome.

A similar case was seen, again in an adult dairy cow, from a different herd. The aetiology of JHS is poorly understood and possible enterotoxaemic and / or fungal toxicosis causes as suggested by some authors are both disputed. There are descriptions in the literature of acute, localised, mixed inflammation response and associated vasculitis and perivascular haemorrhage in the mesentery. It is thought that these changes may be an important part of the pathogenesis of the condition but their cause remains unknown.

Abomasal impaction

A nine-year-old cow presented with an unsteady gait, low temperature and hyper-salivation. She had calved two weeks previously. The left side of the abdomen was swollen and responded to treatment with a spasmolytic but the cow died suddenly six hours later. On post mortem examination the rumen, omasum and abomasum were enlarged and impacted with dry forage.

There was no evidence of a structural blockage within the tract and there were no adhesions within the peritoneal cavity. Primary abomasal impactions can occur due to the feeding of dry, rough forage over the winter months particularly in pregnant animals that increase their feed consumption to meet the needs of an increased metabolic rate. Secondary abomasal impactions can occur due to traumatic reticulo-peritonitis or as sequelae to a resolved abomasal volvulus or dilation. Type IV vagal indigestion is seen in late pregnancy and is thought to be due to an enlarged uterus shifting the abomasum to a more cranial position which inhibits normal emptying.

Poor dentition and feed impaction was diagnosed in a four-year-old bull submitted with a history of persistent diarrhea and weight loss. At necropsy there were irregular teeth with gaps between the molars, exposure of the teeth roots and sharp jagged grinding surfaces. Copious ingesta was packed in the gaps between molars (FIGURE 1). The rumen was distended and packed with copious moist, good quality fiber and the small intestine and caecum were markedly distended by a thin, fluid slurry of ingesta containing some long fragments of fiber.



FIGURE 1: Poor dentition with feed impaction in a bull.

Rumenitis and abomasitis in calves

Ruminal feeding and rumenitis was diagnosed on full post mortem examination of a four-week-old milk fed calf which died suddenly. There was superficial acute inflammation and necrosis of the ruminal epithelium with heavy bacterial and yeast colonisation of the mucosa being detected on histology. *Candida albicans* was recovered from the lesion.

There were similar findings in two fourteen-day-old calves from a unit experiencing high mortality and diarrhea in calves. On histological examination, the abomasal mucosa was replaced by necrotic debris and fibrin and colonised by numerous fungal bodies with invasion into the expanded submucosa, which was densely infiltrated by neutrophils. Submucosal vessels were congested with occasional vessels invaded by fungal structures. *Candida* sp was recovered from the lesions.

Johne's disease

1,783 sera were tested for MAP antibody during the reporting period, of these three hundred and one were positive.

583 faeces samples were tested for the presence of MAP nucleic acid by RT-PCR of which 107 were positive.

Reproductive and mammary diseases

Abortion

Salmonella Dublin and *Bacillus licheniformis* were the most common abortion pathogens detected during the quarter, this reflects the usual seasonal increase in *Bacillus licheniformis* infections.

Abortion due to foetal abnormality

Atresia ilei was recorded in one foetus during the reporting period and in another case an accessory lung was seen in the abdominal cavity of an aborted calf

Mastitis

During the reporting period, *Streptococcus uberis* was the most commonly diagnosed cause of bovine mastitis, followed by *Staphylococcus aureus* and *Streptococcus dysgalactiae*.

Neurological diseases

Listerial encephalitis was diagnosed in a two-year-old heifer which was submitted with a history of neurological signs and access to mouldy silage. On histological examination there was an encephalitis, most severe in the brainstem with parenchymal micro-abscessation containing many neutrophils. There was microglial reaction and microglial nodules. There was heavy perivascular cuffing with cuffs composed mainly of lymphocytes and histiocytes and occasional admixed neutrophils. The histology was considered typical of listerial encephalitis.

Cerebrocortical necrosis

Polio-encephalomalacia (cerebrocortical necrosis / CCN) was diagnosed in a four-month-old calf discovered recumbent and hypothermic on the shed floor. Grossly the cerebral cortex appeared multifocally yellow and these foci auto-fluorescesced under ultraviolet light. On histology cerebrocortical necrosis characterised by laminar malacia and activation of cortical blood vessels with swollen endothelial cells and perivascular clear space was detected. There was cortical oedema and thickening of the leptomeninges with a mild to moderate lympho-histiocytic inflammatory infiltrate and vacuolation within the white matter.

Histological findings confirmed polio-encephalomalacia typical of CCN.

Other diseases of cattle

Pyelonephritis associated with chronic phlebitis of the omphalic vein was diagnosed in a nine-month-old bull calf. At necropsy both kidneys were enlarged with multiple necrotic foci present in the cortex and cavitation with liquid pus. Haemolytic *E.coli* was recovered from the lesions.

Peritonitis

Peritonitis associated with an urachal abscess attached to the cranial pole of the bladder was diagnosed in a three-month-old calf. The abdomen was distended with blood-tinged cloudy fluid and there were multiple fibrinous and fibrous visceral adhesions.

Vena caval thrombosis

Hepatic abscessation, posterior vena caval phlebitis and thrombosis with pulmonary thrombo-embolism was diagnosed in four-year-old dairy cow which died suddenly.

On gross examination there was a large abscess near the diaphragmatic surface of the liver, causing posterior vena caval thrombosis, with bulging lesions into the blood vessel. In the lung there were miliary randomly located foci of red purple consolidation and / or suppuration. There was interlobular oedema and occasional thrombi were detected in branching pulmonary blood vessels.

SMALL RUMINANTS: SHEEP

Respiratory diseases

Pasteurellosis and Jaagsiekte were the most common causes of ovine pneumonia recorded during the quarter.

Atypical Jaagsiekte (OPA) was diagnosed in a four-year-old ewe which showed OPA-like lesions at gross post mortem. Histologically, the lesions comprised multifocal to confluent well-circumscribed mature scirrhous nodules enclosing numerous acini lined with cuboidal to columnar epithelioid cells. The latter were often detached from the acinar wall and lying freely in the cavity. Amongst the scirrhous tissue were numerous lymphocytes and neutrophils with occasional macrophages. No mitotic figures were evident in the fibrous component of the lesions. The surrounding pleural parenchyma showed compression. The histological features of the lung lesions are consistent with atypical Jaagsiekte.

Alimentary diseases

Coccidiosis was confirmed in an eight-week-old lamb with diarrhoea. Coccidial oocysts were detected in large numbers in the faeces and the diagnosis was confirmed histologically with mucosal necrosis in the small and large intestine with the presence of developmental stages of coccidia and coccidial oocysts.

Nematodirosis (faecal egg count, 500 epg) was diagnosed in a ten-week-old lamb at grass in January. Whilst nematodirosis in Northern Ireland is most often associated with the 'spring hatch', an increasing number of cases are being seen in autumn and winter. These are possibly associated with naturally later hatching populations, or a decreased temperature dependency in some spring populations allowing autumn hatching. The lamb also had a septic polyarthritis associated with haemolytic *E. coli* infection.

Johne's disease

Two sera were tested for antibody to MAP during the reporting period, of which one was positive. Eight faeces samples were tested for the presence of MAP nucleic acid by RT-PCR, of which none were positive

Reproductive diseases

Abortion

Abortion due to *Chlamydophila abortus* (EAE) and *Toxoplasma gondii* were common during the reporting period. *B. licheniformis* was also recorded frequently and two outbreaks of campylobactiosis as a cause of abortion were recorded.

Listeria monocytogenes was recovered in profuse pure culture from the foetal stomach contents (FSC) of aborted lambs from a flock in which six out of 250 ewes had aborted over a short period of time.

Abortion due to foetal abnormality

Porencephaly (large cavities in the cerebral hemispheres) were seen in aborted lambs from one flock. Foetuses were seronegative for Schmallenberg virus (SBV) and RT-PCR on foetal tissues was negative for the presence of SBV nucleic acid.

Neurological diseases

Listerial encephalitis in hoggets, meningitis associated with *Bibersteinia trehalosi* and brain abscessation due to *Trueperella pyogenes* infection were all diagnosed during the quarter.

Urinary tract disease

Urolithiasis was diagnosed in a nine-week-old male lamb (FIGURE 2). The lamb presented stiff 3-4 days before death. Several other lambs were affected with similar clinical signs. The penile urethra was completely obstructed with a plug of mucus and crystals. The bladder was very dilated and contained uroliths. Both kidneys were extremely swollen and pale.

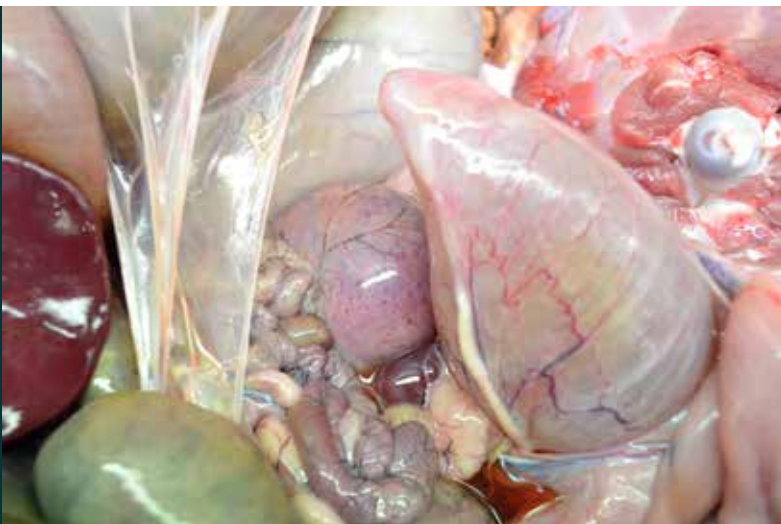


FIGURE 2: Urolithiasis in a lamb, there is marked bladder distension

Other diseases of sheep

Necrobacillosis was diagnosed in a one week old lamb which showed extensive confluent lesions of caseous necrosis in the liver. Histologically there were numerous filiform bacteria at the periphery of the necrotic areas.

Ruptured aorta

Aortic tear with catastrophic intrathoracic haemorrhage was the cause of death in a heavily pregnant ewe. On gross examination the left thoracic cavity was filled with clotted blood adherent to the mediastinum. There was soft tissue haemorrhage around the descending aorta associated with a 6cm long tear in the aorta wall (FIGURE 3).



FIGURE 3: Aortic tear in a ewe

Rickets in a lamb

An eleven-month-old pregnant Romney ewe-lamb was submitted for post mortem examination. The lamb appeared to have a shifting lameness/general skeletal soreness from observation and wished to lie. The physes of many limb bones appeared very wide (FIGURE 4). Histopathology was typical of rickets. Rickets was considered highly likely, considering the lush winter pasture and heavily haired breed. Lush pasture is low in vitamin D, high carotene levels in lush pasture further antagonise vitamin D activity in intestine and bone. The heavy fleece, this being late winter (or beginning of spring), our northern latitude, and this hogget being pregnant all increase the risk of rickets. There was suppurative mesenteric lymphadenitis due to *Yersinia pseudotuberculosis* also in this lamb.



FIGURE 4: Rickets in a lamb, note the width of the distal growth plate on the left. On the right is the radius of a similarly aged unaffected lamb, the growth plate is barely noticeable

HORSES:

45 swabs were examined for the presence of *Tayorella equigenitalis*, all were negative. One swab was cultured from a horse with a history suggestive of strangles during this quarter, this was negative.

BIRDS: Cage and aviary

Iron storage disorder was tentatively diagnosed on the basis of histological changes in the liver of an Ecuadorian red-lored amazon (red lored parrot: *Amazona autumnalis*). The liver was congested, and throughout the hepatic parenchyma the normal architecture was disrupted by ill-defined nodular proliferation of hepatocytes, suggestive of regeneration; there were very numerous megalocytes which were distributed in a poorly-defined periportal- to-bridging pattern; within the cytoplasm of most hepatocytes there was yellow-brown -granular material, often forming dense intra-cytoplasmic clusters. Perl's staining for haemosiderin was strongly positive. Histological findings on the liver were considered suggestive of chronic hepatopathy, possibly linked to an iron storage disorder.

CAMELIDS:

TB in alpacas

Tuberculosis (TB) was diagnosed in three alpacas from the same farm during the reporting period. In the first case, weakness and dyspnoea of around six weeks duration was noted in the history; prior to death the animal had become cachexic. At necropsy the lungs were found to be substantially consolidated and presented miliary pale lesions suggestive of tubercles. Histological examination showed multi-focal to confluent caseo-necrotic lesions to be present in the lungs and associated lymph nodes. Each lesion displayed peripheral fibrosis and lympho-granulocytic inflammation; the lesions were positive for acid fast organisms by Ziehl-Neelsen (ZN) staining, and *Mycobacterium bovis* spoligotype 272 was identified by culture.

The second submission involved two animals and the history was supplemented by the report of a positive result in each case from a commercially available multiplex serological test used to detect antibody to *Mycobacterium bovis*. At gross examination, lesions suggestive of TB were noted in the lungs, respiratory tract associated lymph nodes and - in one alpaca - the liver. Histological examination showed multiple lesions featuring lympho-granulocytic peripheral cuffing with caseo-necrotic cores and heavy presence of degenerating neutrophils in the lungs, lymph nodes and liver. Occasional acid fast organisms were seen in ZN stained tissue sections in both cases. TB was again confirmed by culture of *Mycobacterium bovis*.

Nephritis in an alpaca

A nine-year-old alpaca was submitted having been euthanased on welfare grounds following lethargy and recumbency. At necropsy the kidneys were enlarged with pale cortices. Histological examination showed multifocal cortical mineralisation mainly confined within the profiles of distended distal tubules; there was sub-acute interstitial nephritis, mainly peri-tubular in distribution and many proximal tubules and collecting ducts were filled within eosinophilic material. Some glomerular capsules were distended with eosinophilic non-cellular content. The findings were considered consistent with a protein losing nephropathy which was chronic and on-going. The presence of neutrophils and lymphocytes in the interstitium suggested a bacterial cause.

WILDLIFE and EXOTICS

Cystinuria was diagnosed in a nine-year-old maned wolf submitted from a zoological collection. At gross post-mortem examination both kidneys were found to be rather enlarged, and the bladder wall was severely congested and petechiated. Grossly, no large urinary concretions were noted in the kidneys, bladder, ureters or urethra.

Urine analysis revealed a high level of ketones in the urine (likely the consequence of recent food refusal), together with blood and protein. The pH was 5.0. Contusion/petechiation seen in the urethral wall was probably due to passage of a catheter. Cytospin analysis of the urine revealed very numerous small hexagonal crystals in addition to haemolysed and un-haemolysed RBCs, inflammatory cells (mostly neutrophils) and epithelioid cells. The morphology of the crystals (FIGURE 5) matched that of cystine uroliths, which are occasionally found in samples of acidic urine. Histological examination of the kidneys revealed tubulo-epithelial necrosis of the proximal tubules and marked tubulo-epithelial vacuolation of the distal tubules with frequent dark brown non-cellular irregular concretions and occasional yellow or clear crystals in the tubule lumen. There was intracellular brown granular pigment in the epithelium of some distal tubules and collecting ducts and eosinophilic non-cellular content in many collecting ducts. In the bladder there was congestion, haemorrhage, fibrinous oedema and chronic inflammation throughout the full thickness of the wall, with epithelial necrosis and occasional inclusion of unstained crystalline material in the superficial layer. Cystinuria is an inborn error of metabolism characterized by defective transport of cystine by the tubulo-epithelial cells of the kidneys.

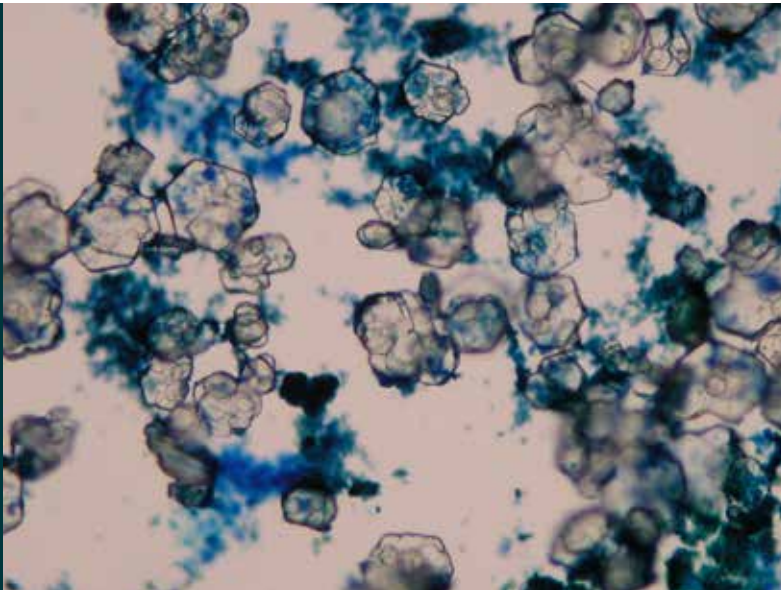


FIGURE 5: Cystine uroliths detected in the urine of a maned wolf