Northern Ireland Disease Surveillance Report, January to March 2022

- Pneumonic pasteurellosis in cattle
- Pulmonary embolism in cattle
- Johne’s disease in sheep
- Listerial encephalitis in sheep

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for January to March 2022

CATTLE:

Pneumonia due to Mannheimia haemolytica

Severe acute fibrinous pleuropneumonia due to primary *M. haemolytica* infection was diagnosed in a three-year-old dairy cow. At necropsy there was severe bronchopneumonia with marbling affecting 80-90% of the total lung volume. Fibrinous pleurisy was present and there were multiple foci of red – black haemorrhagic necrosis. Histology showed alveolar necrosis with intra-lesional bacteria present and associated infiltration of neutrophils, oat cells and macrophages. There was also oedema, fibrin exudation, haemorrhage and thrombosis. The interlobular septae were expanded by fibrin and the pleura were expanded by fibrin, oedema and inflammatory cells predominately neutrophils, oat cells and macrophages. Bronchioles contained necrotic debris, bacteria, fibrin and inflammatory cells. *M. haemolytica* was recovered in profuse growth from lung and spleen and RT-PCR testing did not detect the presence of BVD, RSV, PI3 or IBR nucleic acids.

Pneumonia due to Mycoplasma bovis

Pneumonia due to *Mycoplasma bovis* and IBR infection was diagnosed in heifers in a herd experiencing higher than usual losses. Arthritis and suppurative synovitis was also seen on post-mortem examination of heifers from this herd and RT-PCR testing showed the presence of *Mycoplasma bovis* nucleic acid thus strongly incriminating the organism in this arthritis.

In another herd severe chronic suppurative pneumonia, suppurative arthritis and middle ear disease (FIGURE 1) was diagnosed in growing calves.

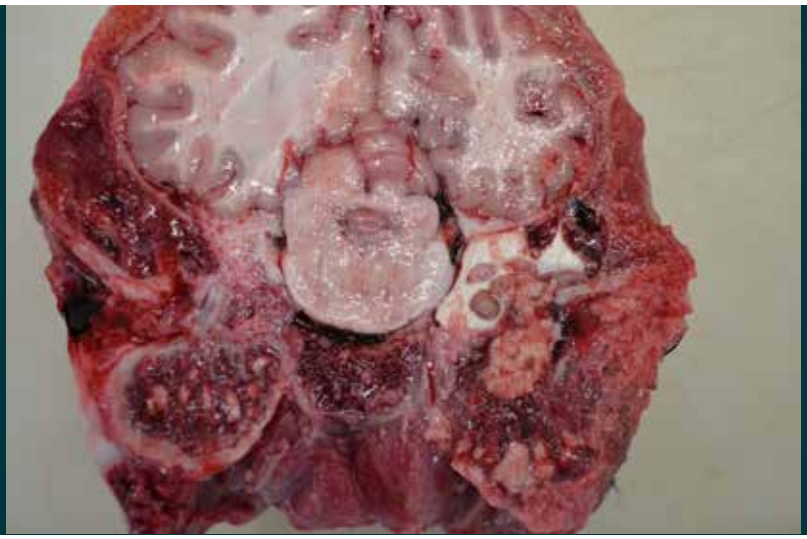

FIGURE 1: Suppuration in the tympanic bullae of a four-month-old calf with *Mycoplasma bovis* infection.

At necropsy there was severe antero-ventral consolidation affecting 75% of lung volume. There were miliary foci of suppuration/caseous necrosis throughout all lung lobes. There were fibrous pleural adhesions between visceral and thoracic wall pleura. Histological examination showed chronic suppurative bronchopneumonia; bronchi, bronchioles and alveolar spaces contained necrotic debris, macrophages, multinucleated cells and bacterial colonies. There were many large foci of caseous necrosis, some with central mineralisation, which were bordered by neutrophilic infiltrates.

Calf pneumonia (BRD)

Calf pneumonia was diagnosed in an eight-month-old bullock. At gross postmortem examination, fibrinous pericarditis was noted, with 60% red consolidation of the cranio-ventral lung lobes, extending to the caudo-dorsal lobes. There was extensive fibrinous pleurisy with fibrinous pleural adhesions and bullae formation. The tracheal epithelium showed severe congestion and diphtheresis with stable foam and some ingesta in the lumen. There were multiple infarcts in both kidneys. Histologically, there was congestion, alveolar oedema and focal- to- confluent necrosis throughout the pulmonary parenchyma, with associated zonal toxically-modified neutrophilic inflammation and septal emphysema.

In the trachea there was fibrino-necrotic diphtheresis with acute tracheitis, bacterial colonisation (small rods) and squamous metaplasia of the epithelium. The lung tissue was positive by RT-PCR for *Mycoplasma bovis* and *Trueperella pyogenes* was recovered in a septicaemic pattern. IBRv was identified in the lung tissue (but not the trachea) by RT-PCR. It is likely that IBR was the primary cause of pneumonia in this case.

Alimentary diseases

Segmental necrosis of the small intestine with associated localised peritonitis was diagnosed on gross examination of a five-year-old dairy cow which had died following sudden onset of dullness and loss of milk. The cause of the necrosis could not be discerned but torsion or other circulatory compromise was considered most likely.

Johne's disease

987 sera were tested for MAP antibody during the reporting period, of these one hundred and seventy were positive.

Reproductive and mammary diseases

Abortion

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

Other reproductive diseases

Colonic atresia causing marked fluid distension of the caecum, small intestine and abomasum was seen in a four-day-old calf. This congenital lesion was considered to be genetic in origin.

Mastitis

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

Neurological diseases

Histophilus somni septicaemia and thrombotic meningo-encephalitis (TEME) were diagnosed in a heifer which was presented having died following neurological signs and recumbency. At necropsy, meningeal congestion, multifocal brain haemorrhages, laryngeal erosion, oesophagitis and excess

synovial fluid were detected in the carcase. All these lesions were considered suggestive of *H. somni* septicaemia. Multi-focal fibrinous vasculitis with presence of fibrin thrombi and haemorrhages in the cerebrum and cerebellum was detected on histological examination of the brain. *H.somni* was cultured from brain and lung. There were focally extensive areas of neuropil rarefaction containing neutrophils and gitter cells. These lesions are typical of TEME. RT-PCR detected the presence of BVDv nucleic acid in blood but not lung tissue, suggesting an acute intercurrent BVD infection in this case.

Other diseases of cattle

Vena caval thrombosis and pulmonary septic embolism sere seen on gross examination of an adult dairy cow which had developed clinical signs of pain and mania prior to death. There were multiple large hepatic abscesses some of which impinged on the posterior vena cava. There was pronounced oedema and emphysema of the lungs; histologically blood vessels and capillaries contained bacterial colonies and bacterial thrombi. There were increased numbers of neutrophils in alveolar septae and in capillaries, with necrosis, oedema and fibrin exudation.

Laurel poisoning and 'choke' in a bull

Ingestion of cyanogenic laurel (*Prunus laurocerasus*) and subsequent cyanide poisoning was considered to be a contributing cause of death in a bull which was presented with a history of sudden death. Interestingly a plastic bag was found in the anterior oesophagus, occluding the lumen of the larynx, with associated soft tissue haemorrhage and oedema. It was thought that choke had been the main cause of death but laurel ingestion and cyanosis may have contributed (FIGURE 2).

FIGURE 2: Occlusion of the larynx by a regurgitated plastic bag, laurel poisoning was a likely complicating factor in this case

SMALL RUMINANTS: SHEEP

Alimentary diseases in young lambs

Emphysematous abomasitis most likely caused by chemical damage to the mucosa resulting from high acidity due to the presence of fermenting undigested milk, subsequent Sarcina **ventriculi** infection and gas production was diagnosed in two five-week-old lambs from the same flock. Large numbers of coccidial oocysts were detected in the caecal contents of both lambs. Histological examination of the colon confirmed pathogenic coccidial infection with numerous macrogametes present within enterocytes and associated enterocyte rupture. The crypts were distended with inflammatory debris.

Lactobezoars causing retention of fluid in the lower small intestine and caecum were found to be the cause of death in four-week-old lambs in another flock.

Johne's disease

3 sera were tested for MAP antibody during the reporting period, of these one was positive.

Johne's disease was diagnosed in two-year-old ewes in two separate flocks. At necropsy large intestineal contents were very watery and the caecal lymph node was enlarged. Histology showed lesions in the intestine and mesenteric lymph node which were considered consistent with Johne's disease. Multi-focally the intestinal mucosa was expanded by an infiltrate of large epitheliod macrophages and fewer lymphocytes. Similar inflammatory infiltrates were present in submucosa and Peyer's patches of the small intestine. The mesenteric lymph node showed focal necrosis with mineralisation and an inflammatory infiltrate of macrophages and multinucleated giant cells. MAP nucleic acid was detected in the faeces by RT-PCR. The ewe submitted from one flock had an intercurrent chronic bronchopneumonia.

Nutritional and metabolic disease

Copper poisoning

Copper toxicity was diagnosed in a two-year-old Dutch Spotted ewe which showed icterus and characteristic gun-metal grey kidneys at necropsy. Kidney and liver copper levels were in the usually stated toxic range, being 45 ug/g and 289 ug/g wet weight respectively.

Reproductive diseases

Abortion

Abortion due to *Chlamydophila abortus* (EAE) or*Toxoplasma gondii* were most common during the reporting period. *T. pyogenes* and *E. coli* were also recorded frequently as causes of sporadic bacterial abortion. *Salmonella* Dublin was diagnosed in two flocks and abortions due to *Salmonella* Diarizonae, some associated with foetal / placental retention and ewe deaths were diagnosed in one flock. *Arcanobacterium pluranimalium* was considered to be the cause of some of the abortions occurring in a lowland flock experiencing a higher than usual abortion rate..

Several separate flock showed abortion storms due to *Campylobacter fetus*. In one flock 30 of 150 pregnant ewes aborted. Carrier sheep are important in the epidemiology of this disease but once abortions begin to occur the rapid transmission of infection to pregnant ewes must be abrogated as far as possible. Strict hygiene and biocontainment, disposal of abortion material and separation of aborted ewes from the flock are very important. Flock or group treatment with long acting oxytetracycline products may also be of benefit.

Other reproductive disease

Uterine prolapse with or without vaginal rupture was seen in several separate flocks especially in over-condition ewes. Prolapse is a complex condition, but high levels of intra-abdominal fat, rumen over- fill and large lambs may all serve to increase intra-abdominal pressure.

Neurological diseases

Listerial encephalitis

Listerial encephalitis was diagnosed in ewes from two different flocks during the reporting period. In one flock botulism had originally been suspected because of the use of poultry litter on sheep pasture. *Clostridium botulinum* C/D toxin was not detected by ELISA in this case. In both submissions the diagnosis was made on the basis of brain histology. There was 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. There was oedema and rarefaction of the neuropil.

Urinary tract disease

Gross postmortem examination of a 7-month-old lamb submitted showed there was intense congestion of the bladder wall with bladder rupture. The abdominal cavity contained a large excess of yellowish fluid smelling of urine. The bladder content was bloody with white gritty material present, and cytospin preparation of the urine revealed large amounts of blood, inflammatory cells, epithelioid cells, spermatozoa and numerous crystalline concretions. Individual crystals and small groups exhibited a needle-like crystal structure, likely calcium phosphate. Urolithiasis was therefore confirmed in this lamb. On histological examination of the bladder wall, there was interstitial haemorrhage and oedema with acute necrotising cystitis and complete loss of the bladder epithelium. The kidneys were enlarged with focal capsular adhesions and a large amount of urine was present in the pelvis of each kidney. On histological examination there was oedema, haemorrhage, necrosis and acute inflammation associated with the calyces. Ascending pyelonephritis associated with the urolithiasis was diagnosed.

In another flock, an unusual case of urethral obstruction associated with bladder rupture was recorded in a ewe, in this case the obstruction was caused by a bladder mucosal slough which had resulted from cystitis.

HORSES:

One swab wasexamined for the presence of *Streptococcus equi* during the quarter, this was negative.

Fifty four swabs were examined for the presence of *Tayorella equigenitalis* , all were negative.