Northern Ireland Disease Surveillance Report, July to September2021

- Lungworm in cattle
- Blackleg in cattle
- ITME in cattle
- Haemonchosis in sheep
- Nephrosis in sheep
- Copper poisoning in sheep
- Oedema disease in pigs

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

CATTLE:

Respiratory diseases

Lungworm in cattle

Verminous pneumonia (*Dictyocaulus viviparus* and secondary bacterial infection) was diagnosed in three first season calves which had been submitted due to ill thrift. The carcasses were thin with no subcutaneous or perivisceral fat. In each there was faecal soiling of the perineum and ringworm patches on the head and neck. In the lungs there was 30% red-grey consolidation in the caudo-dorsal lobes mainly with patchy consolidation in the cranio-ventral lobes. The broncho-mediastinal lymph nodes were enlarged and adult lungworms were visible in the airways including the tracheal lumen. Lungworm larvae were detected in faecal samples, and lesions typical of parasitic bronchopneumonia, including presence of larvae in the pulmonary tissue, were recorded on histological examination. Anthelmintic treatment had been undertaken one month previously and re-infection was considered highly likely although a degree of anthelmintic resistance could not be ruled out.

Other cases investigated in different herds during the reporting period involved concurrent infection with IBRV and *Mycoplasma bovis*. In all there were ten reports of verminous pneumonia during this quarter and in four of these cases the cattle affected were more than twelve months of age.

Alimentary diseases

A twelve- month- old heifer was submitted with a history of having been treated for pneumonia. On post mortem examination there were extensive purulent lesions in the lungs. There was also a severe abomasitis; the lining of the abomasum was purulent. *Trueperella pyogenes* was recovered from multiple organs, including the lungs and the abomasum. On histology many *Ostertagia* sp. nematodes were identified in the abomasal epithelium. A strongyle egg count of 800 eggs per gram was also recorded.

Abomasal perforation

Abomasal ulceration with perforation and resulting *E. coli* septicaemia causing renal infarction and septic thrombo-embolic pneumonia was diagnosed in a two-month-old calf. Histologically there were multiple thrombi present in the lungs with an associated acute fibrino-necrotic lobar pneumonia. In the kidney, histological examination showed the presence of multiple infarcts with zones of coagulative parenchymal necrosis surrounded by a haemorrhagic border.

Johne's disease

1,171 sera were tested for MAP antibody during the reporting period, of these one hundred and fifty three were positive.

Reproductive and mammary diseases

Abortion due to *Salmonella* Kottbus infection

S. Kottbus was recovered in profuse pure growth from the foetal stomach contents (FSC) of a calf which was aborted around three weeks prior to term. One other abortion had occurred in the herd shortly before this case. *S.* Kottbus is a rare serovar in Northern Ireland but has been reported as causing disease in cattle and poultry, including abortion in cattle. It is considered that there is a potential zoonotic risk.

Ureaplasma abortion

Histological examination of the lungs from a bovine foetus of seven months gestation showed bronchopneumonia typical of Ureaplasma diversum abortion. Large lymphoid follicles were detected near the bronchi. No other significant organisms were detected and foetal serology was unremarkable.

Other reproductive diseases

Suspected congenital defects in calves

DORV (double outlet right ventricle) was diagnosed in a three-month-old Holstein heifer calf submitted after showing dyspnoea. In this condition, both the aorta and the pulmonary artery emerge from the right ventricle (FIGURE 1). The calf also had a septal defect. DORV is a rare condition in cattle and has been described in Angus, Brangus, Hereford, Chianina and Holstein breeds. DORV has been reported in humans with an incidence of 1 to 3 % of all congenital heart defects reported.

FIGURE 1: Double outlet right ventricle in a calf; this is a rare congenital heart defect in cattle. The aorta is on the right and the pulmonary artery is on the left

Congenital cardiomyopathy

Congenital cardiomyopathy was diagnosed in a fourteen- month -old Holstein heifer. At necropsy a large amount of clear yellowish fluid was seen in the abdomen, there was marked subcutaneous and peri-visceral oedema and the liver was enlarged, with a very firm, fibrous texture and an irregular rather nodular surface. Multiple fibrous pleural and pleural-pericardial adhesions were noted, but there was no pulmonary consolidation.

On histological examination marked centri-lobular and bridging congestion with mid-zonal intrahepatic cholestasis was noted in the liver. In the heart there was segmental myofibrillar degeneration and interstitial oedema with mild fibrosis. Cardiomyopathy and hepatic changes associated with heart failure were diagnosed. The histological changes in the myocardium are possibly suggestive of a congenital aetiology rather than an infectious or nutritional cause.

Mastitis

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

Neurological diseases

CASE 010220 VRO SF

Infectious thrombotic meningoencephalitis (ITME) caused by *Histophilus somni* was diagnosed in a seven-month-old heifer calf submitted with a history of meningitis. On gross examination of the brain there were multifocal discrete haemorrhages in the cerebral hemispheres, midbrain and hindbrain. Histopathology was typical of ITME with multifocal areas containing thrombotic blood vessels, haemorrhage, bacterial colonies and neutrophilic infiltrate with oedema and malacia of adjacent neuropil. Muscle lesions consistent with ischaemic necrosis due to recumbency were also present in this case.

Cerebrocortical necrosis (CCN)

CCN characterised histologically by laminar malacia and activation of cortical blood vessels with swollen endothelial cells and perivascular clear space was diagnosed on full postmortem examination of a six-month-old calf which presented with neurological signs.

Urinary tract diseases

Urolithiasis with resultant cystitis and urethral obstruction were diagnosed on full postmortem examination of a three-month-old castrated male calf. On gross examination, the carcase was found to be congested and there was a large amount of clear fluid in theabdomen which had a uraemic smell. Massive gelatinous oedema surrounded both kidneys, which also featured fluid-filled cysts at the cortico-medullary boundary. There was a pale area in the cortex of the left kidney, representing infarction. The bladder lining was haemorrhagic. The urethra was blocked by a brown elongated urolith 3cm long, with congestion in the urethral wall surrounding it (FIGURE 2). Histological examination of the obstruction and cytospin examination of scrapings from the bladder wall revealed the presence of large amounts of crystalline material, and the morphology of the crystals was consistent with struvite (phosphatic) crystals. The obstruction itself comprised laminated fibrin, inflammatory cells and other cell debris as well as incorporated crystalline material.

FIGURE 2: Urolithiasis in a castrated male calf, the large brown coloured urolith can clearly be seen

Musculoskeletal diseases

Clostridial myositis (Blackleg) was diagnosed in two growing bullocks from the same herd. In each case the carcase was congested with a butyric smell and there was copious blood-tinged fluid in the thoracic and abdominal cavities. In one animal, the left chest wall musculature and the right thigh and gluteal muscles were dark, haemorrhagic and oedematous. In the other animal the myocardium was similarly affected. Blackleg was confirmed in each case by histological examination which showed mild interstitial oedema, haemorrhage, acute inflammation and mild myofibrillar necrosis. In all, sixteen cases of Blackleg were reported during the quarter.

SMALL RUMINANTS: SHEEP

Alimentary diseases

Parasitic gastroenteritis (PGE) was common during the reporting period with thirty one incidents being investigated in total.

Haemonchosis in a ewe

Haemonchosis was diagnosed in a two-year-old ewe submitted after collapsing in the shearing pen. At gross post-mortem examination the carcase was found to be anaemic, but there was no obvious cause of blood loss. Parasitic gastroenteritis (PGE), possibly haemonchosis, was suspected, and an abomasal wash resulted in the recovery of 99,900 *Haemonchus contortus* worms (FIGURE 3). In addition 50,900 *Trichostrongylus vitrinus* were recovered from the small intestine. It is likely that the stress of shearing precipitated collapse in animals weakened by anaemia. In all three cases of haemonchosis were diagnosed in different flocks during the quarter.

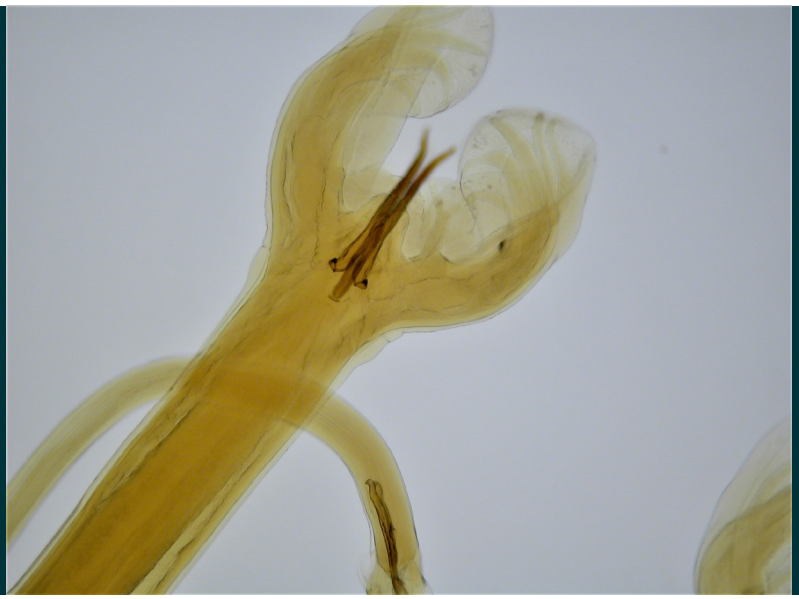

FIGURE 3: *Haemonchus contortus*, this nematode is not very common in sheep in Northern Ireland. This image shows the copulatory bursa of the male worm

Coccidiosis and nephrosis in lambs

Coccidiosis and associated nephrosis were diagnosed in a 3-4-month old lamb. At postmortem examination there was a large amount of blood-stained fluid in the abdomen and thoracic cavity, and there was a pronounced uraemic smell from the carcase, although no evidence of urolithiasis was noted. Histologically, the kidneys were found to be autolytic making interpretation uncertain, but there was tubulo-epithelial necrosis affecting proximal tubules and presence of non-cellular eosinophilic material in many distal tubules and collecting ducts. Parasitological examination revealed PGE and ++++ coccidiosis.

Small intestine content was negative for clostridial toxins. The changes seen in the kidney are most likely to reflect nephrosis of the type reported in lambs of this age following coccidiosis and / or nematodirosis. The aetiology of the condition is not understood and it is sporadic in occurrence.

Autumn nematodirosis in lambs

Nematodirosis was diagnosed in September in three 4-month-old lambs submitted with a history of scour and ill-thrift. At necropsy the intestinal content, including that of the large intestine and caecum, was watery, and the mesenteric lymph nodes were much enlarged. Gut wash and faecal egg count revealed clinically significant PGE, which featured large numbers of *Nematodirus battus* (worm counts up to 35,000). This is a rather unusual finding late in the season, but is consistent with increasing numbers of reports of autumn nematodirosis in recent years, possibly linked to changing weather patterns or the emergence of *Nematodirus* strains which are less temperature dependent for hatching.

Chronic fasciolosis in ewes

Sub-acute and chronic fasciolosis was diagnosed in two adult ewes in mid-September. In the livers of both there was sub-capsular haemorrhage associated with the migration of immature flukes and there were numerous adult Fasciola hepatica in the bile ducts and gall bladder. Juvenile fluke counts were much lower than the adult counts and the faeces were ++++ for liver fluke eggs clearly demonstrating that the burden was mostly mature and likely to be associated with so-called winter infection of snails.

Johne's disease

One ram tested during the quarter was seropositive for MAP.

Nutritional and metabolic disease

Copper toxicity was diagnosed on the basis of full post-mortem examination and tissue chemistry in a Zwartble ewe which died following over-supplementation with copper. The gross pathology included jaundice (FIGURE 4 - next page), dark kidneys and haemoglobinuria. Liver and kidney copper levels were 91 and 67 ug/g respectively.

FIGURE 4: Jaundice in a copper poisoned ewe, the yellowing of body and omental fat can clearly be seen

HORSES:

Two swabs were examined for the presence of *Stretococcus equi* during the quarter, both were negative.

PIGS:

Oedema disease due to infection with *E. coli* O-139 was diagnosed on full post-mortem examination of three fourteen-week-old gilts. Gross findings were not striking but there was peri-orbital oedema and fibrin stranding in the peritoneal cavity in each case. Histologically there was perivascular oedema in the brain.

Necrotic enteritis

Necrotic enteritis was diagnosed in two eight-month-old Tamworth pigs. Histopathology showed serosal congestion and petechiation of the colon with severe focal necrotising enteritis of the mucosal surface and associated bacterial colonisation (mixed types including large rods). There was full-depth ulceration of the mucosa with associated fibrinous diphtheresis and oedematous thickening of the colonic wall and acute inflammation extending deep into the submucosa. In the small intestine there was serosal congestion with petechiation and fibrin strands, affecting mainly the distal jejunum and ileum.