



# afbi

## Northern Ireland Disease Surveillance Report, October to December 2021

- Adenovirus infection in a bullock
- Atypical interstitial pneumonia (fog fever) in cows
- Myocarditis due to *Histophilus somni* infection in a heifer
- Salmonella Dublin infection in cows
- Urolithiasis in a ram
- Adenomatous intestinal polyps in a ewe
- Copper poisoning in a goat

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

## CATTLE:

### Respiratory diseases

#### Parasitic pneumonia (husk)

Parasitic pneumonia due to infection with *Dictyocaulus viviparus* was common during the reporting period. Typical cases showed red-grey coloured consolidation mainly in the caudal lung lobes with emphysematous bullae present in some cases. Adult lungworm were detected in the airways and the presence of lungworm larvae in the faeces was demonstrated by use of the Baerman test. Secondary bacterial infection was common. Histologically there was broncho-interstitial pneumonia with marked presence of eosinophils in the interstitium, airways and alveoli, pneumocyte hyperplasia, hyalinisation, petechial haemorrhage and septal emphysema.

#### Fog fever in cattle

Atypical interstitial pneumonia was diagnosed in a five – year - old cow based on gross and microscopic pathology. The cow had been moved from bare to lush pasture less than two weeks prior to death. Grossly the lungs were emphysematous and with marked interstitial oedema present. Histologically there was alveolar oedema, presence of alveolar hyaline membranes and hyperplasia of type II pneumocytes with macrophages and occasional eosinophils in the alveolar spaces. There was emphysema in the inter-lobular spaces and dilation of interlobular lymphatics (due to oedema).

#### Aspiration pneumonia

Severe aspiration pneumonia was diagnosed in a ten –day –old calf which was being treated for diarrhoea. Histologically there was broncho-pneumonia with the bronchi and bronchioles containing foreign material including plant material, bacterial colonies and neutrophils. There was attenuation and sometimes necrosis of bronchial and bronchiolar epithelium, alveolar necrosis, inflammation and haemorrhage. Occasionally bronchioles and alveoli were lined by hyaline membranes (FIGURE 1).

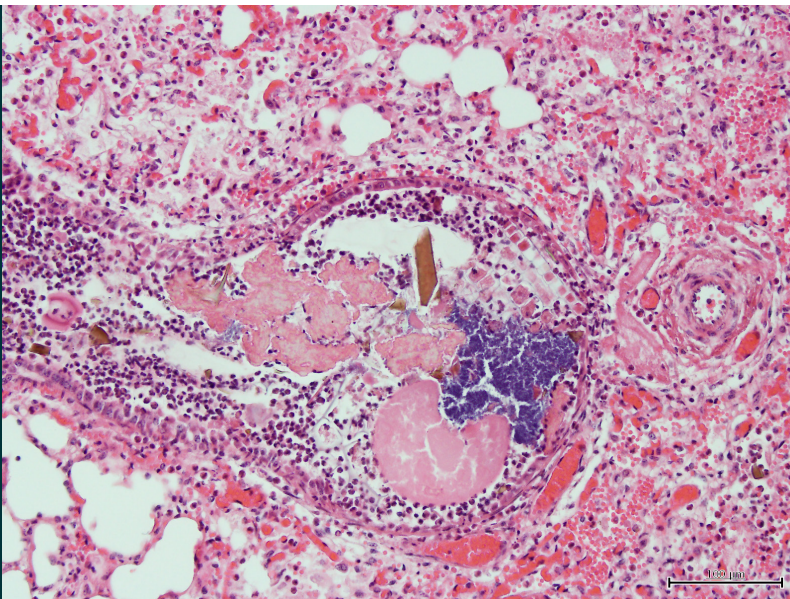


FIGURE 1: Aspiration pneumonia in a calf: Bronchiole containing aspirated plant material, bacterial colonies and inflammatory reaction.

## Alimentary diseases

### Adenovirus infection

Enteritis due to adenovirus infection was diagnosed in an eight-month-old bullock. At necropsy the mucosa of the small and large intestine was congested and the lumen was distended with blood stained fluid containing fibrin casts. On histological examination the small intestine was found to have fibrin and cellular debris over the mucosa with areas of necrosis and a heavy lymphocytic infiltrate. In the large intestine there was cellular debris and haemorrhage superficially, with thickening of the mucosa. Blood vessel profiles in the muscularis and submucosa exhibited swollen endothelial cells with large eosinophilic nuclear inclusion bodies present and chromatin marginated. There were areas of necrosis in the mucosa, with a heavy lymphocytic infiltrate which extended through the submucosa and muscularis (FIGURE 2).

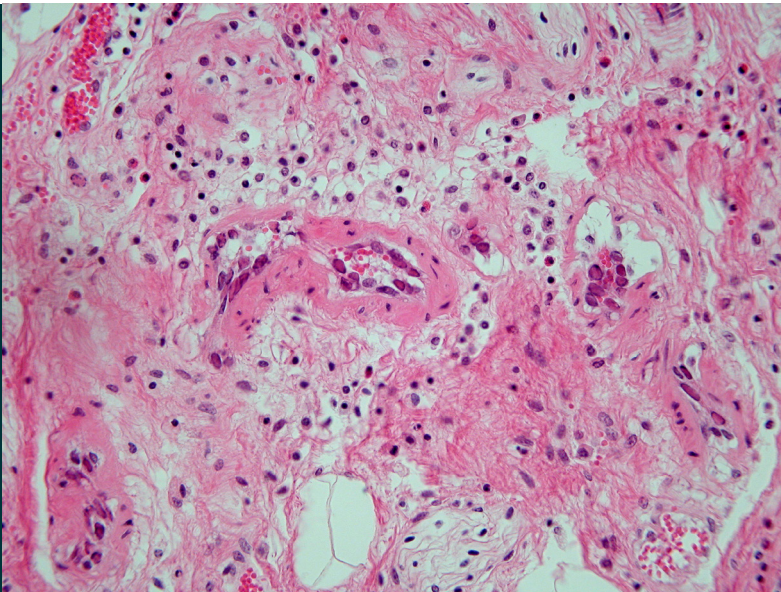


FIGURE 2: Adenoviral enteritis in a bullock, eosinophilic nuclear inclusion bodies can be seen in the swollen endothelial cells of blood vessel walls.

### *Salmonella* Dublin infection in cows

Numerous cases of *Salmonella* Dublin infection were seen in cows in separate herds during the reporting period; frequently, small outbreaks of disease occurred. At necropsy the liver of affected cows was swollen with rounded borders and had a bronze tint in colour; the cut surfaces showed centri-lobular necrosis. Histological examination typically showed extensive hepatic necrosis with both a peri-portal and a more generalised focal distribution. Unaffected hepatocytes (i.e. those not in the necrotic areas) frequently showed fatty degeneration. Focal histiocytic granulomas (scant neutrophils, lymphocytes and macrophages) were present at the margins of the necrotic areas.

### Johne's disease

1,835 sera were tested for MAP antibody during the reporting period, of these two hundred and fourteen were positive.

## Reproductive and mammary diseases

### Abortion

Abortion due to *Neospora* infection was diagnosed on the basis of histology and immunocytochemistry (IHC) in a bovine foetus submitted at around day 180 of gestation. There were focal areas of gliosis in the brain which stained positive for *Neospora* antigen by IHC. Foetal serology was negative in this case.

### Other reproductive diseases

#### Congenital colonic atresia

Congenital colonic atresia was diagnosed in a one-week-old calf in which there was no connection between the caecum and the colon, the latter being collapsed and underdeveloped. The intestinal tract proximal to the lesion was distended with meconium and fluid.

#### Clostridial metritis and myositis

Clostridial metritis and myositis associated with parturition were diagnosed in a five-year-old cow submitted post-partum. At necropsy there was marked vulval swelling with bruising of the reproductive tract, and the uterus, which had failed to involute, contained blood and liquid material. There were dark emphysematous areas in the pelvic musculature.

*Clostridium chauvoei* and *Clostridium septicum* were detected in the affected muscles and uterus.

### 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

### Thrombotic meningo-encephalitis

Thrombotic meningo-encephalitis due to *Histophilus somni* infection was diagnosed in a seven-year-old bull which presented with pyrexia and collapse. Microscopically in the brain, the vascular endothelium was thickened with neutrophils and there was rarefaction of the surrounding parenchyma with haemorrhage and infiltration by neutrophils. Occasional bacterial colonies were seen within the vessels within thrombi. *H. somni* was cultured from brain tissue.

## Cardiovascular diseases

Patent ductus arteriosus was diagnosed in an eighteen-month-old calf. At necropsy the right ventricular wall was of similar thickness to the left ventricular wall and the bulb of the aorta was much enlarged. The pulmonary veins were distended with clotted blood and the liver was congested (FIGURE 3).



FIGURE 3: Patent ductus arteriosus

## Myocarditis due to *H. somni* infection

Myocarditis due to *H. somni* was diagnosed in a seven-month-old Limousin heifer. On gross pathology there was oedema of the pericardium with loosely attached fibrin. There were suppurative foci in papillary muscles of the left ventricle, including a 2cm x 1.5cm pyramidal shaped septic infarct. There were variably sized suppurative foci from 5mm to 2cm diameter in the left ventricular muscle and in the myocardium of the interventricular septum. There were fibrous adhesions between the apex of the heart and pericardium. There was shallow ulceration of laryngeal cartilages and fibrinous pleuritis. *H. somni* was isolated in profuse pure culture from the heart. Left ventricular papillary muscles are a common site of lesions in cases of myocarditis due to *H. somni*.

## Musculo-skeletal disease

Myositis with thrombo-embolisation and vasculitis was seen in a one-year-old heifer which had died suddenly. *Clostridium novyi* was recovered from the lesions and although no lesions typical of black disease were seen in the liver, the carcass was septicemic in appearance with ecchymosis of the musculature.

## SMALL RUMINANTS: SHEEP

### Alimentary diseases

Intestinal obstruction was diagnosed in a seven-year-old ewe submitted with a history of weight loss. Gross post mortem examination and histology revealed fluid distension of the abomasum due to the presence of benign adenomatous polyps at the pylorus which were blocking the opening into the duodenum.

### Johne's disease

361 sera were tested for MAP antibody during the reporting period, of these two were positive.

### Urinary tract disease

#### Urolithiasis

Urolithiasis was seen in an eighteen-month-old ram. On gross examination the bladder was distended with blood stained urine and there were numerous small yellow-brown smooth calculi in the bladder and penile urethra with associated blockage of the urethral appendage.

### Other diseases of sheep

Pyo-granulomatous erosion of a blood vessel wall with subsequent catastrophic haemorrhage was diagnosed in a two-year-old ewe which had been seen staggering in the field immediately prior to death. At necropsy the mouth cavity was full of blood with some ingress into the naso-pharynx; in the left lateral oro-pharynx there was a small nodule of infected granulomatous tissue, in the midst of which could be seen a large blood vessel remnant. Histologically, granulation tissue centered on a large blood vessel was detected and there was erosion of the endothelium with exudation of fibrin and the presence of a mixed cell inflammatory infiltrate in the ruptured blood vessel wall. Thrombo-embolic encephalitis was detected on brain histology. The cause of the original injury could not be ascertained, but a penetrating injury by a thorn or grass awn was thought likely.

## SMALL RUMINANTS: GOATS

### Copper poisoning

Copper poisoning was diagnosed in a six-month-old goat which was submitted after being euthanised on welfare grounds following jaundice and severe wasting. At gross post-mortem examination evidence suggestive of haemolytic crisis was noted. The jaundiced appearance of the carcass, together with discolouration of the liver, kidneys and urine was considered to be consistent with copper poisoning. Histological examination of the liver revealed that the Kupffer cells and many individual hepatocytes were engorged with yellow-brown granular pigment; there was mild hepatocellular necrosis. In the kidney there was intracytoplasmic yellow-brown granular pigment in the tubulo-epithelial cells of the proximal tubules and there was tubule-epithelial necrosis.

Large amounts of yellow-brown granular material were present in the lumen of the distal tubules and collecting ducts. Liver copper was in the high range (91 ug/g) while kidney copper was within the toxic range (39ug/g). Considering the previously reported findings of haemolytic crisis with hepato-cellular necrosis, chronic copper poisoning was considered likely in this case.

## HORSES:

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

## PIGS:

*Haemophilus parasuis* infection was diagnosed in two eight-week-old pigs from a unit in which growing pigs were showing neurological signs and higher-than-usual mortality rates.

On gross examination of both pigs there was fibrinous pericarditis, pleurisy and pulmonary consolidation with about 30 to 40% of the total lung field affected. Histological examination of the brain of one of the pigs showed severe thrombo-embolic meningo-encephalitis.

*H. parasuis* was recovered from systemic cultures.

## BIRDS: Cage and aviary

Pigeon paramyxovirus infection was diagnosed in a loft experiencing short onset high mortality with birds becoming dull and diarrhoeic before death. At necropsy all birds examined were dehydrated with presence of liquid small and large intestinal contents and green watery faeces. The kidneys were pale in each case and there was pulpiness of the spleen. Brain, intestinal and visceral tissue pools were positive for the presence of PMV-1 nucleic acid by RT-PCR.

## Necrotising hepatitis

Necrotising hepatitis was diagnosed in pigeons from a loft with a high mortality rate. Histological examination of the livers of affected birds showed multifocal to coalescing necrosis with individualisation of hepatocytes, hyper-eosinophilic hepatocytes and vacuolar degeneration of hepatocytes. Intra-nuclear inclusions were frequent and some were large and basophilic and expanded the nucleus or occurred with a haloed affect and margination of nuclear chromatin. Eosinophilic haloed inclusions were also frequent and there was peri-vascular lymphocytic cuffing with few heterophils. Herpesvirus or adenovirus infection was considered likely, and it was not possible to rule out co-infection.

## WILDLIFE and EXOTICS:

Pyo-granulomatous pneumonia due to *Otostrongylus circumlitis* infection and septicaemia due to *Streptococcus phocae* were diagnosed in a young harbour seal which was found dead on a County Down beach. It was noted that verminous pneumonia is common in juvenile harbour seals.