

Disease Surveillance and Investigation Branch

DISEASE SURVEILLANCE REPORT

Northern Ireland Disease Surveillance Report, July to September 2015

- Endocarditis in a cow
- Blackleg in unvaccinated calves
- Copper poisoning in pedigree sheep
- Malignant oedema in a ram
- Fungal pneumonia and air-sacculitis in turkeys
- Salmonellosis in fattening pigs
- Coccidiosis and Marek's Disease in game fowl

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for July to September 2015

CATTLE:

Respiratory diseases

Respiratory disease was identified in 41 cattle post mortem submissions between July and September 2015. The most common pathogens identified included *Mycoplasma bovis* (eleven cases), *Pasteurella multocida* (eight cases), *Mannheimia haemolytica* (seven cases) and *Trueperella pyogenes* (five cases).

Ten instances of parasitic pneumonia (husk) due to *Dictyocaulus viviparus* infection were diagnosed at necropsy in first and second season calves during the reporting period. It was noted that control of lungworm infection can be achieved by both vaccination and appropriate use of anthelmintics and that development of immunity is also important for protection.

Pulmonary embolism in a dairy cow

A three-year-old dairy cow was submitted with a history of pneumonia which was unresponsive to treatment. On gross examination there was vegetative endocarditis of the tricuspid valve and a severe thrombo-embolic pneumonia with the presence of multiple septic emboli, haemorrhage, pulmonary oedema and a sub acute inflammatory infiltration. *T. pyogenes* was recovered in profuse growth from the heart and lung lesions.

Alimentary diseases

BVD and Mucosal disease

Fibrino - purulent pleurisy and epicarditis were diagnosed in a four-week-old calf which was presented with a history of collapse and death. On gross examination there was fibrino -purulent pericarditis and epicarditis with a profuse amber pleural effusion. There was fibrino-purulent pleurisy with loose adhesions between parietal and visceral pleura. The left middle and anterior lung lobes were consolidated. *M. haemolytica* was recovered from the lung and BVDV nucleic acid was detected by RT-PCR indicating acute or persistent infection with BVDV. There was also a heavy infestation of the biting louse *Damalinia bovis* in the inguinal region.

Abomasitis and abomasal rupture

Abomasitis due to *Clostridium sordellii* infection was detected in a two-month-old calf submitted with a history of sudden death. There had been rupture of the hyperaemic and oedematous abomasal wall and *Cl. sordellii* was detected in the lesions by fluorescence.

Abomasal rupture following ulceration was diagnosed in a three-year-old bull which had a history of a change of husbandry from pasture to indoor feeding of concentrates. The change in management had been necessitated by the poor summer weather.

An unusual case of abomasal rupture following traumatic de-vitalisation of the abomasal wall was recorded in August. A young calf had landed on the pen wall when jumping out of the pen and had thereafter been noted as dull and inappetent. At gross post mortem there were two large areas of necrosis of the abomasal serosa and mucosa with loss of the mucosa. There was an associated fibrinous peritonitis. No significant pathogens were detected.

Jejunal haemorrhage syndrome in a dairy cow

A five-year-old dairy cow was submitted with a history of sudden death following a brief period of dullness and fall in milk yield over the previous three milkings. Clinical examination had detected abdominal pain and undigested grain had been noted in the faeces. Five other cows in the herd had died over a short period of time. On gross examination there was a fibrinous peritonitis associated with the small bowel and there was a large adherent blood clot present in the distal jejunum and proximal ileum. There were multiple perforations of the bowel wall in the same region and intestinal contents were free in the abdomen. The rumen pH was low (5.27) and a diagnosis of acidosis and jejunal haemorrhage syndrome was made. It was noted that the aetiology of this condition is uncertain but it is likely to be associated with feeding a diet high in fermentable carbohydrate. The role of *Clostridium perfringens* type A toxin, *Aspergillus fumigatus*, other mycotoxigenic fungi and Shiga toxin producing *E. coli* is subject to debate. Risk reduction involves the maintenance of normal abomasal and intestinal motility, consistent diet in high feed intake cows, stress reduction and possible vaccination with polyvalent clostridial vaccines.

Neonatal enteritis

The pathogens identified in neonatal bovine faecal samples during the quarter are shown in TABLE 1. Overall, *Cryptosporidium* species and Rotavirus were the most common pathogens identified.

TABLE 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, July to September 2015

Pathogen	Number	
	Tested	Positive (per cent)
<i>Cryptosporidium</i> species	119	21 (17.6%)
Rotavirus	112	27 (24.1%)
Coronavirus	112	7 (6.3%)
<i>Escherichia coli</i> K99	38	1 (2.6%)

Other enteric conditions

Parasitic ova found in ruminant faeces samples submitted during the period are shown in TABLE 2 (over page)

TABLE 2: Endoparasitic infections in ruminants in Northern Ireland, July to September 2015

	Total	No of parasitic ova					% positive
		Negative	+	++	+++	++++	
Liver fluke							
Bovine	713	659	44	7	3	0	7.8%
Ovine	246	228	11	5	1	1	7.3%
Paramphistome							
Bovine	713	454	77	118	33	31	36.3%
Ovine	246	205	18	19	4	0	16.7%
Coccidia							
Bovine	752	521	188	25	6	12	30.7%
Ovine	249	56	157	32	4	0	77.5%
Strongyle worm egg count							
	Total	<500 epg	≥500 epg				% Positive
Bovine	750	681	69				9.2%
Ovine	251	195	56				22.3%

≥500 eggs per gram of faeces (epg) was considered of likely clinical significance
 + Low, ++ Moderate, +++ High, ++++ Very high

Johne's disease

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 144 bovine faecal samples. 10 samples (6.9 per cent) contained acid-fast organisms typical of MAP. Of 2308 bovine blood samples that were tested for antibodies to MAP 258 (11.2 per cent) were positive.

Reproductive and mammary diseases

Abortion

Specimens from 72 bovine abortions and stillbirths were examined during the 3rd quarter. Significant pathogens were detected in 31 cases (43.1 per cent). Of these, *E. coli* (8 cases, 11.1 per cent) was the most commonly identified pathogen. Other pathogens identified included *Salmonella* Dublin (5 cases, 6.9 per cent), *Bacillus licheniformis* (3 cases, 4.2 per cent), *Neospora caninum* (3 cases, 4.2 per cent), and *T. pyogenes* (2 cases, 2.8 per cent).

Mastitis

A total of 345 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. 47 (13.6 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 31 samples. *E. coli* was the most frequently isolated organism and accounted for 21.7 per cent of isolates cultured. Other frequently identified organisms included *Streptococcus uberis* (19.1 per cent), *Staphylococcus aureus* (11.6 per cent), *Streptococcus dysgalactiae* (5.5 per cent) and *Bacillus cereus* (4.1 per cent).

Neurological diseases

Clostridium botulinum type D *toxicosis* was diagnosed in 11 cases during the 3rd quarter of 2015. As usual the spreading of broiler litter on pasture prior to grazing was a common factor.

Cerebrocortical necrosis

Cerebrocortical necrosis (CCN) was diagnosed by histological examination of the brain of a five-month-old calf which had been at grass before showing an acute onset of nervous signs including blindness. Two other calves in the group of twenty three had died recently after showing similar signs. It was noted that although sporadic, cases of CCN may occur in small clusters, and grazing of lush pasture may have been the trigger in this herd.

Urinary tract disease

Nephritis due to *T. pyogenes* was diagnosed in a six-week-old calf. Grossly there were miliary pale yellow necrotic foci in the renal cortices. The urine was haemorrhagic and there was a 6 – 7 cm long rubbery cast obstructing the penile urethra at the level of the sigmoid flexure. It was considered that the bacterial nephritis likely precipitated the urolith formation through shedding of bacteria, cellular debris and inflammatory and mucoproteins into the urinary tract.

Skin disease

Cutaneous actinobacillosis was diagnosed by histological examination of biopsies taken from numerous circumscribed, pedunculated skin lesions on the flank of a stirk.

Musculo-skeletal diseases

Blackleg in calves

Eighteen instances of blackleg were diagnosed by full post mortem examination during the reporting period and many of these involved multiple deaths. Affected calves were in the age range of four to sixteen months and both beef and dairy herds were affected. Blackleg can be prevented by vaccination and suitable vaccines are readily available.

Other diseases of cattle

Malignant catarrhal fever (MCF) was diagnosed on full post mortem examination of a steer which had died following pyrexia, muco-purulent nasal discharge and tachypnoea. At necropsy there was peeling of the skin of the muzzle, blood staining of the prepuce, haematuria and prominent mesenteric lymph nodes. Histological changes were suggestive of MCF and serology for MCF antibody was positive.

Poisoning due to yew

Toxicity due to ingestion of the leaves of the common yew (*Taxus baccata*) was diagnosed as the cause of death in a two-month-old suckler calf. Other calves and cows in the batch which had also just been moved to new grazing were unaffected. Yews contain toxic alkaloids, nitriles and ephedrine as well as oil of yew. The principle toxin is taxine which causes cardiac arrest by blocking myocardial conduction by the disruption of calcium and sodium channels in cardiac myocytes.

Ventricular septal defect in a heifer

A ventricular septal defect was diagnosed in an eight-month-old heifer which was found dead. Pathology consistent with congestive heart failure was present including ascites, oedema of the abdominal mesentery, submandibular oedema, subcutaneous oedema of the neck and passive hepatic congestion. It was noted that ventricular septal defect is a common congenital condition in cattle (FIGURE 1 next page)

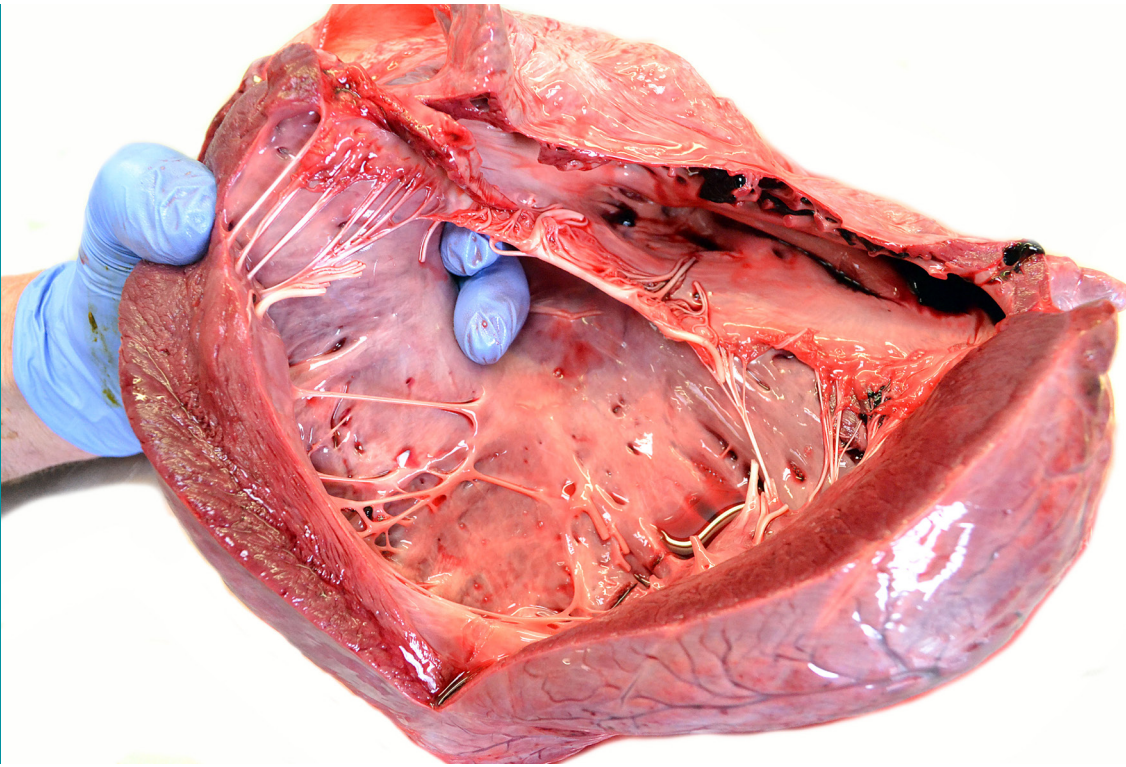
SMALL RUMINANTS: SHEEP

Respiratory diseases

Respiratory disease was identified in eight ovine post mortem submissions during this quarter. *M. haemolytica* (three cases), fibrinous pleurisy (two cases) and laryngeal chondritis (one case) were the most common diagnoses.

An unusual lesion was detected on post mortem examination of a five-month old ram lamb.

There was a 20 mm diameter, 60 mm long protrusion of the pharyngeal mucosa from the left lateral pharyngeal wall to form a thick-based pedunculated mucosa-covered mass of soft tissue with a central spicule of bony material measuring 15 mm by 3 mm.

**Figure 1**

Ventricular septal defect in a heifer

**Figure 2**

Copper poisoning in a Texel ewe, the yellow colouration of the carcass and omental fat can clearly be seen

The structure was mobile and the rounded tip was lying over the atrium of the larynx, and the rounded mass of tissue at the tip could reach the cranial laryngeal lumen. Histological examination showed a central spicule of bone with cartilage at either end and a growth plate at one end adjacent to a small medullary cavity. The bone was surrounded by connective tissue and clusters of mucus glands. Additionally there was severe pulmonary abscessation associated with *T. pyogenes* infection.

Alimentary diseases

Fourteen instances of parasitic gastro-enteritis were recorded in sheep submitted for post mortem examination during the reporting period. Most cases were in first season lambs including those bought during early autumn for winter finishing. In some cases lambs had not been dosed with anthelmintic whilst in others re-infection was likely because of the long interval between treatment and presentation.

Johne's disease

2 ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. No samples contained acid-fast organisms typical of MAP. Of 6 ovine blood samples that were tested for antibodies to MAP 1 (16.7 per cent) were positive.

Nutritional and metabolic disease Copper toxicity in pedigree sheep

There were ten recorded diagnoses of poisoning due to copper (FIGURE 2- previous page) during the reporting period. Ewes, rams (including recently purchased tup lambs) and lambs were affected and the pedigree sector was overly represented. The over-feeding of concentrates to pedigree breeding stock to achieve high growth rates may result in copper toxicity but other conditions such as mesenteric torsion in lambs, acidosis, clostridial enterotoxaemia and urolithiasis in ram lambs may also result from this practice.

Reproductive diseases

Abortion

No specimens from ovine abortions or stillbirths were examined during the 3rd quarter.

Neurological diseases

No cases of listeriosis were confirmed by post mortem examination during the 3rd quarter of 2015

Skin diseases

In one instance sheep affected by sheep scab (*Psoroptes ovis*) had been treated with an ivermectin based product, however only a single injection had been given rather than the recommended two injections separated by an interval of seven days. It was noted that manufacturer's usage instructions must always be followed when using veterinary medicinal products and that care must also be taken to avoid re-infestation as the mite can survive for up to fifteen days in the environment (FIGURE 3- next page).

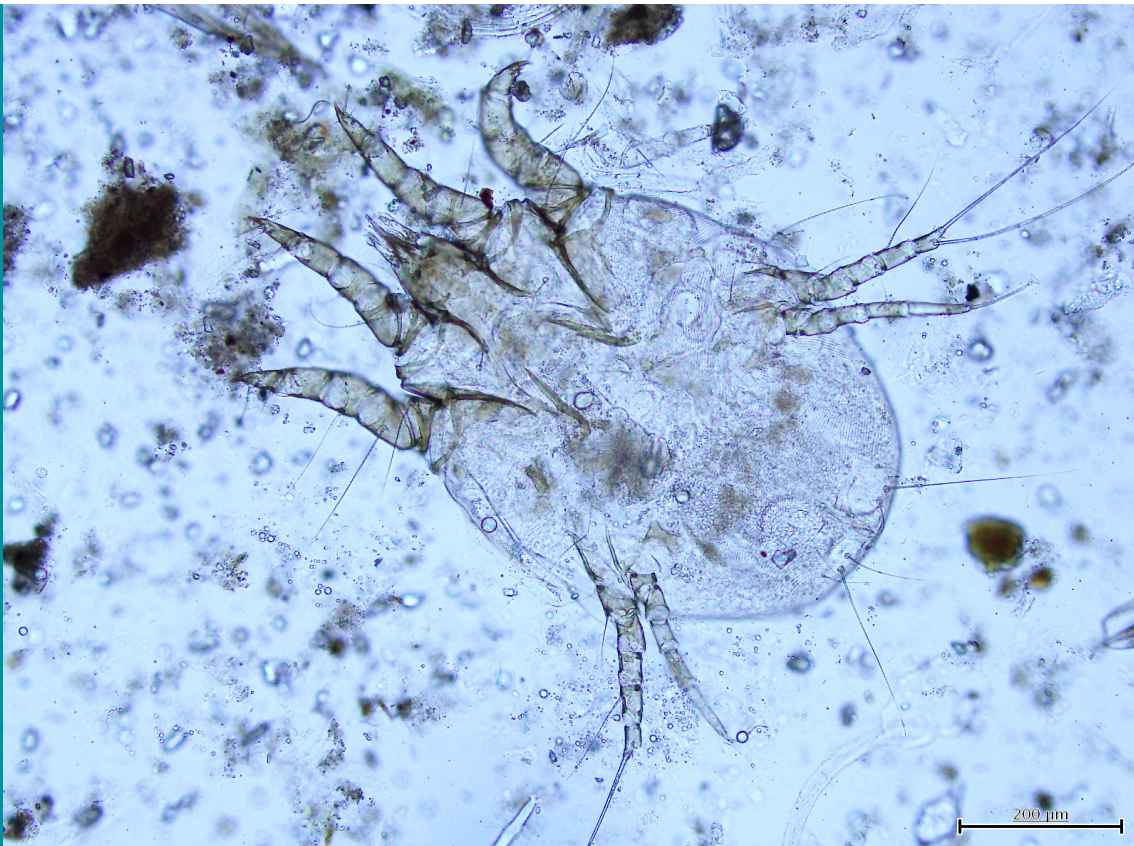
Malignant oedema of the scrotum was diagnosed in a six-month-old Jacob ram which died shortly after returning from a show. *Cl. sordellii* was demonstrated in the lesions by immunofluorescence.

HORSES:

1 swab was examined for the presence of *Tayorella equigenitalis* during this quarter, this swab was negative. 8 swabs were cultured from horses with a history suggestive of strangles during this quarter, all of which were negative.

PIGS;

Porcine reproductive and respiratory syndrome virus (PRRSV) was isolated from the lung of a pneumonic piglet diagnosed with pneumonia and septic arthritis. No virus specific lesions were seen on lung histology but it was considered that secondary infection with *P. multocida* and *T. pyogenes* had caused severe lesions of bacterial pneumonia which may have masked underlying pathology. *Salmonella choleraesuis* was recovered from the liver, lung and spleen and this organism was also considered to be a potential primary pathogen.

**Figure 3**

Psoroptes ovis
sheep scab
mite

**Figure 4**

Oviductal
adenocarcinoma
in a hen, trans-
coelomic spread
is evident

BIRDS: Poultry **Chickens**

Adenovirus infection of the gizzard

Histological examination of gizzards from twenty-four-day old chickens showed acute necrotising gastritis, with mixed inflammatory infiltrate extending the full depth of the glandular layer with necrosis and loss of the koilin layer. There was a mononuclear cell infiltrate and oedema surrounding blood vessels in the muscularis and intranuclear inclusion bodies typical of adenoviral inclusions were evident in the glandular layer.

Impaction of the gizzard

Impaction of the gizzard, pylorus and proximal duodenum was diagnosed in eight-week-old free-range broilers. The alimentary tracts of affected birds were obstructed by plugs of matted grass up to 8 cm long. In each case there was only scant grit present in the gizzard. A total of six birds had died prior to submission. Advice was given on grass management and access to adequate insoluble grit.

Oviductal adenocarcinoma

Two instances of oviductal adenocarcinoma with trans – coelomic implantation of the intestinal serosa, mesentery and pancreatic capsule were recorded during the reporting period (FIGURE 4- previous page). The age range of birds affected was thirty months to four years.

Turkeys

Severe pyo-granulomatous pneumonia and air-sacculitis due to fungal infection was diagnosed in a group of four-month-old turkeys which presented with a history of weight loss and dyspnoea. On gross examination, thick creamy coloured plaques were seen on the thoracic air-sac membranes and in the lungs. Histology confirmed the presence of branching, septate, Periodic acid – Schiff (PAS) positive fungal hyphae within pyogranulomas.

Game fowl

Coccidiosis and Marek's disease were diagnosed on full post mortem examination of game fowl which presented with a unilateral limb paralysis.

WILDLIFE and EXOTICS:

Lymphosarcoma was diagnosed in a twenty-five-year old palm Cockatoo (*Probosciger artemimus*) submitted from a zoological collection. There was severe and generalised infiltration of the hepatic parenchyma by heterogenous lymphoid-type cells with a high mitotic index with an associated fibrinoid hepatic necrosis.