

Disease Surveillance and Investigation Branch

DISEASE SURVEILLANCE REPORT

Northern Ireland Disease Surveillance Report- 1st July to 30th Sept 2018.

- Parasitic pneumonia in cattle
- Polioencephalomalacia in lambs and calves
- Dosing gun injuries in sheep
- Pituitary abscessation in pigs
- Tuberculosis in a cat

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1st July to 30th September 2018.

CATTLE:

Respiratory diseases

Respiratory disease was identified in 49 cattle postmortem submissions between July and September 2018. The most common pathogens identified included lungworm (fifteen cases), *Mycoplasma bovis* (ten cases), *Pasteurella multocida* (six cases), *Mannheimia haemolytica* (six cases) and respiratory syncytial virus (two cases).

Fifteen cases of pneumonia due to lungworm were recorded throughout the summer with most cases recorded in September. The number of cases recorded was slightly lower than the 18 cases recorded during the same period in 2017. In one case verminous pneumonia was diagnosed in two heifers based on gross pathology and histopathology (see figure 1). Ten other animals had already died in this batch. Lungworm pneumonia was also diagnosed in the plucks of culled cows taken from the abattoir to investigate non-responsive coughing in several herds of dairy cows.



Figure 1

Heavy lungworm burden in the trachea of a nine-month-old heifer.

Alimentary diseases

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 2018

Pathogen	Number	
	Tested	Positive (per cent)
<i>Cryptosporidium</i> species	72	23 (31.9%)
Rotavirus	73	19 (26.0%)
Coronavirus	73	4 (5.5%)
<i>Escherichia coli</i> K99	22	2 (9.1%)

Other enteric conditions

Parasitic ova found in ruminant faeces samples submitted during the period are shown in Table 2.

Table 2: Endoparasitic infections in ruminants in Northern Ireland, July to September 2018.

	Total	No of parasitic ova					% positive
		Negative	+	++	+++	++++	
Liver fluke							
Bovine	518	471	44	3	0	0	9.1%
Ovine	227	194	19	12	1	1	14.5%
Paramphistome							
Bovine	518	292	52	95	30	49	43.6%
Ovine	227	186	9	21	5	6	18.1%
Coccidia							
Bovine	555	365	163	8	8	11	34.2%
Ovine	231	41	163	19	5	3	82.6%
Strongyle worm egg count							
	Total	<500 epg	≥500 epg		% Positive		
Bovine	555	519	36		6.5%		
Ovine	231	148	83		35.9%		

≥500 eggs per gram of faeces (epg) was considered of likely clinical significance

+ Low, ++ Moderate, +++ High, ++++ Very high

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out on 335 bovine faecal samples by PCR. MAP was detected in 64 samples (19.1 per cent). Of 1786 bovine blood samples that were tested for antibodies to MAP, 254 (14.2 per cent) were positive.

Johne's disease was diagnosed in a six-year-old dairy cow that had been losing body condition for 6 weeks and eventually became recumbent. On histological examination there was granulomatous enteritis and typhlitis with cell associated acid fast bacilli. There was also marked endocardial mineralisation, mineralised alveolar walls, foci of pulmonary necrosis and abscessation associated with fungal proliferation. MAP was detected by PCR and antibody to MAP was also detected.

The jejunum of a five-year-old Holstein Friesian cow was obstructed by a long sausage-shaped luminal blood clot. Proximal to the obstruction small intestine was distended by a large volume of green

watery fluid while distal to the obstruction the ileum was void of content. It was considered that this may have been a case of jejunal haemorrhage syndrome (JHS). JHS is an increasingly reported condition in North America, Scotland and Europe. JHS affects dairy cattle more commonly than beef cattle. The definitive cause of JHS is unknown although *Clostridium perfringens* type A maybe involved. *Aspergillus fumigatus*, mycotoxins and nutritional factors may also be involved.



Figure 2

Jejunal haemorrhage syndrome.

Severe necrotizing mycotic reticulorumenitis was diagnosed in a ten-year-old cow. Grossly the walls of the reticulum and rumen were thickened, oedematous and haemorrhagic. Histologically there was necrosis, haemorrhage and inflammation with thrombosis. There were large numbers of branching fungal hyphae in the mucosa, submucosa and affected blood vessels. It was considered possible that a recent change in feeding potentially causing carbohydrate overload may have resulted in ruminal acidosis predisposing to the mycotic infection.

Toxic conditions

A one-year-old Holstein heifer calf which had failed to thrive for three months was euthanased after developing nervous signs and pneumonia and submitted for postmortem examination. Three other animals from the batch were presenting similarly and a further three animals had already died. Similar problems had been experienced last year. On postmortem examination the liver was firm and pale, while there was fresh blood and mucus in the proximal small intestine with darker blood more distally. Histologically there was severe generalised hepatoparenchymal fibrosis with extensive biliary hyperplasia and nodular regeneration. Hepatocytes were irregular in size, and many had conspicuously large nuclei, suggestive of megalocytosis. The histological features of the liver were suggestive of poisoning due to pyrrolizidine alkaloids (ragwort poisoning). It was considered that the enteric haemorrhage may have been a result of blood clotting defects consequent to the severe hepatopathy. The nervous signs described were considered characteristic of animals with hepatoencephalopathy.

Two cases of copper toxicity in cows were recorded during the quarter. One case affected a 3.5 year old Jersey cow which suddenly stopped eating and milking and died within 24 hours. At postmortem examination the carcass was icteric, kidneys were dark, the liver was orange brown and there was haemoglobinuria. Liver (298.7 µg/g wet weight) and kidney (197.1 µg/g wet weight) copper levels were considered high to toxic.

Neurological diseases

Two cases of polioencephalomalacia were recorded during the quarter (see figures 3-6). One case involved two five-month-old heifers which presented with nervous signs including staggering. On gross postmortem examination pallid areas were present in the cerebral cortex which autofluoresced under ultraviolet light. Histologically there was severe rarefaction of the deeper layers of cerebral grey matter with neuronal necrosis and glial cell activation. Histological findings in both calves were consistent with polioencephalomalacia (PEM). PEM may result from thiamine deficiency. It may also occur in animals given access to water after a period of deprivation, or occur in animals on diets or with access to drinking water with high level of sulphates. PEM may also be seen in animals fed high levels of sugar beet pulp or certain *Brassica* plants. PEM is also occasionally described in cases of lead poisoning in cattle.

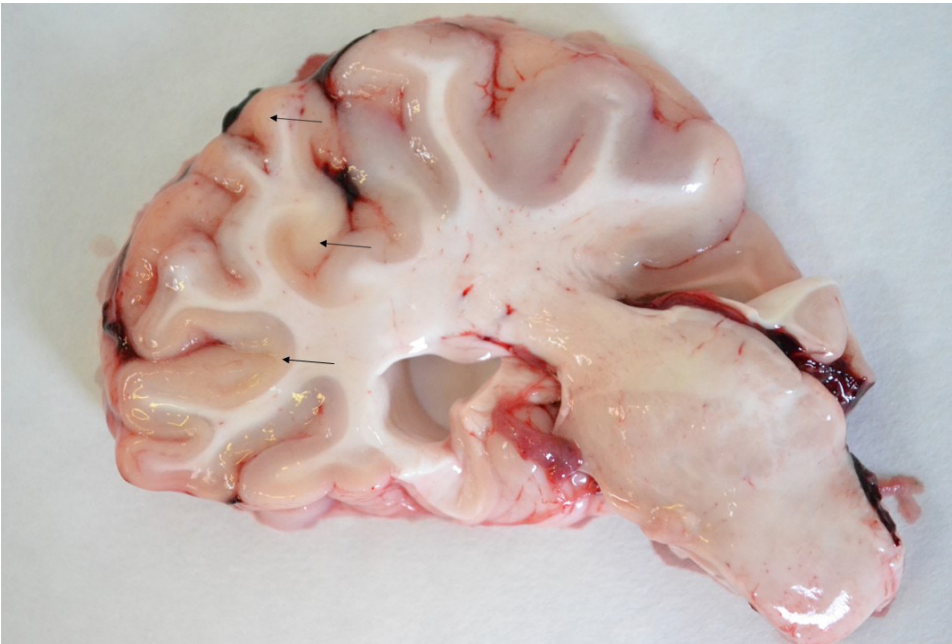


Figure 3

Pallid areas of degeneration in the cerebral cortex (at black arrows)

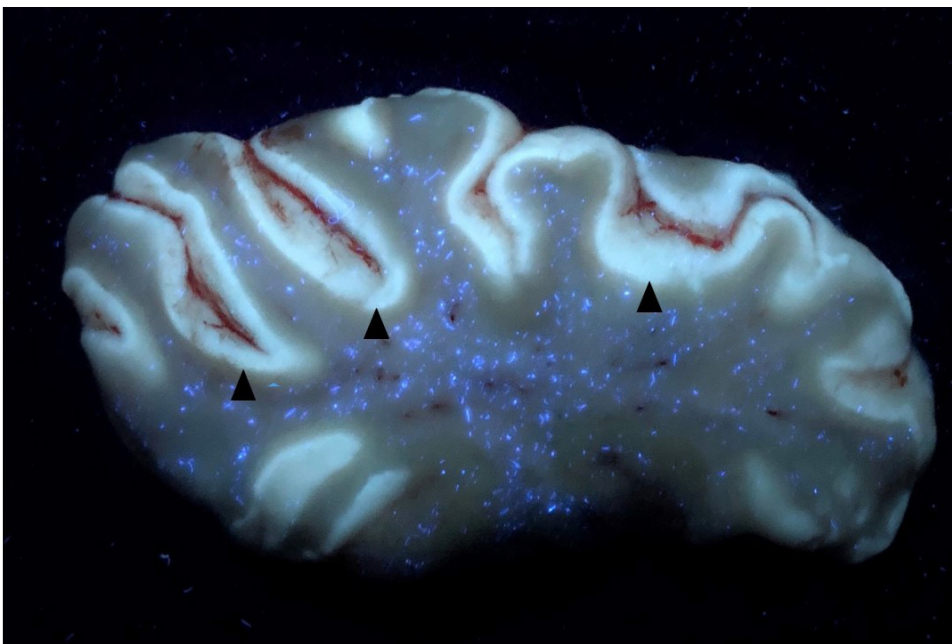
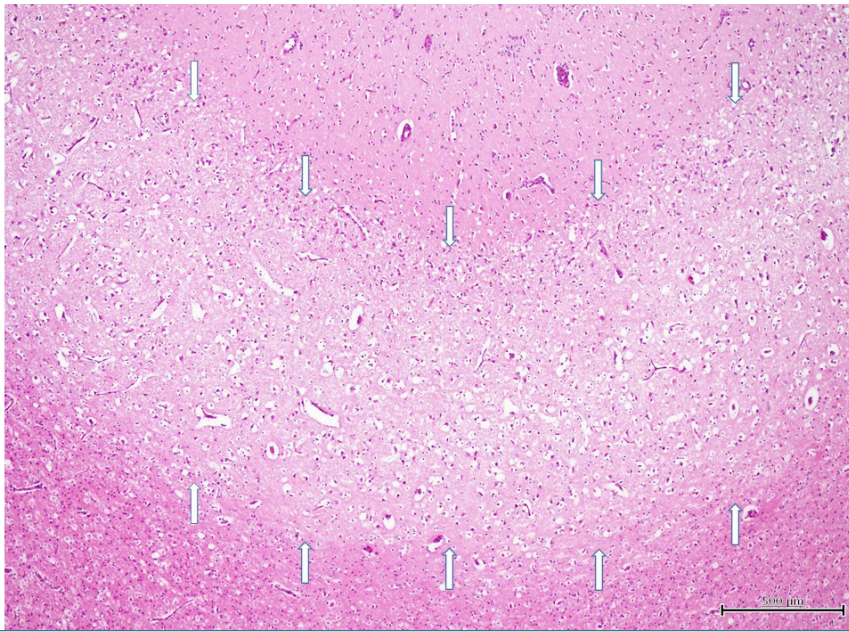


Figure 4

Autofluorescence of the cerebral cortex under ultraviolet light (black arrowheads).

**Figure 5**

Pallid areas of laminar cortical necrosis and degeneration (between white arrows).

Reproductive and mammary diseases

Specimens from 72 bovine abortions and stillbirths were examined during the 3rd quarter. Significant pathogens were detected in 38 cases (52.8 per cent). Of these, *Salmonella* Dublin (9 cases, 12.5 per cent) was the most commonly identified pathogen. Other pathogens identified included *Trueperella pyogenes* (8 cases, 11.1 per cent), *Neospora caninum* (8 cases, 11.1 per cent), *Bacillus licheniformis* (4 cases, 5.6 per cent), and bovine viral diarrhoea virus (4 cases, 5.6 per cent).

Abortion due to *Ureaplasma diversum* was suspected based on suggestive histological changes in the foetal lungs which included diffuse well developed peribronchiolar and perivascular lymphocytic accumulation. *U. diversum* is related to *Mycoplasma* spp, and can be associated with sporadic abortions in cattle, although occasionally outbreaks may occur. *U. diversum* is often present on mucous membranes of the nasal passages, vulva, vagina and prepuce. It may also be present in semen and embryo transfer fluids, can remain viable for long periods and can be transmitted during breeding. Abortion usually occurs in the last trimester, or infection may manifest as premature delivery with the birth of weak or dead calves near term.

Mastitis

A total of 274 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. Thirty four (12.4 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 9 samples. *E coli* was the most frequently isolated organism and accounted for 21.5 per cent of isolates cultured. Other frequently identified organisms included, *Streptococcus uberis* (14.1 per cent), *Streptococcus* species (8.4 per cent), *Pseudomonas* species (6.9 per cent) and *Staphylococcus aureus* (6.9 per cent).

SHEEP:

Respiratory diseases

Respiratory disease was identified in 14 ovine postmortem case submissions during this quarter. *Mannheimia haemolytica* (two cases) and Jaagsiekte (two cases) were the most common diagnoses.

Poisoning

Copper toxicity was diagnosed in an 18-month-old ewe which died suddenly within 24 hours of purchase. At gross post-mortem examination, the carcass appeared jaundiced, the hepatic parenchyma had a yellow-orange discolouration and the kidneys were very dark. Urine was dark brown suggestive of haemoglobinuria. In histopathological sections stained with rubeanic acid there was granular grey-green pigmentation in the hepatocytes and also in the proximal tubuloepithelial cells of the kidney. Elevated liver and kidney copper levels were detected consistent with copper toxicity (liver copper levels were 347.7 µg/g and kidney copper levels were 205.2 µg/g wet weight).

Four cases of fatal poisoning due to ingestion of *Pieris* sp. (Forest Flame) leaves were recorded during the quarter. One of these cases involved garden trimmings which were discarded over the hedge onto adjacent grazing ground.

Alimentary tract conditions

Eighteen cases of parasitic gastro-enteritis due to heavy infections of *Teladorsagia circumcincta*, *Trichostrongylus vitrinus* and *Cooperia curticei* were recorded in first season lambs during the summer, compared to 26 cases during the same period in 2017. Three cases of nematodiriasis were recorded in September. While Nematodirus infection is usually associated with weaning lambs in spring, there is an increasing trend for infection to occur in older lambs in autumn.

Four cases of traumatic oropharyngitis due to suspected dosing/bolus gun injury were recorded during the quarter. All cases involved multiple deaths. In several cases large amounts of clotted blood were present in the reticulorumen due to haemorrhage from the pharyngeal area. In one six-month-old lamb a necrotic tract filled with foul smelling yellow-green purulent material extended from the left oropharynx, alongside the trachea, oesophagus and main blood vessels, through the neck and continued approximately 6-8cms into the dorsal mediastinum (see figure 6).

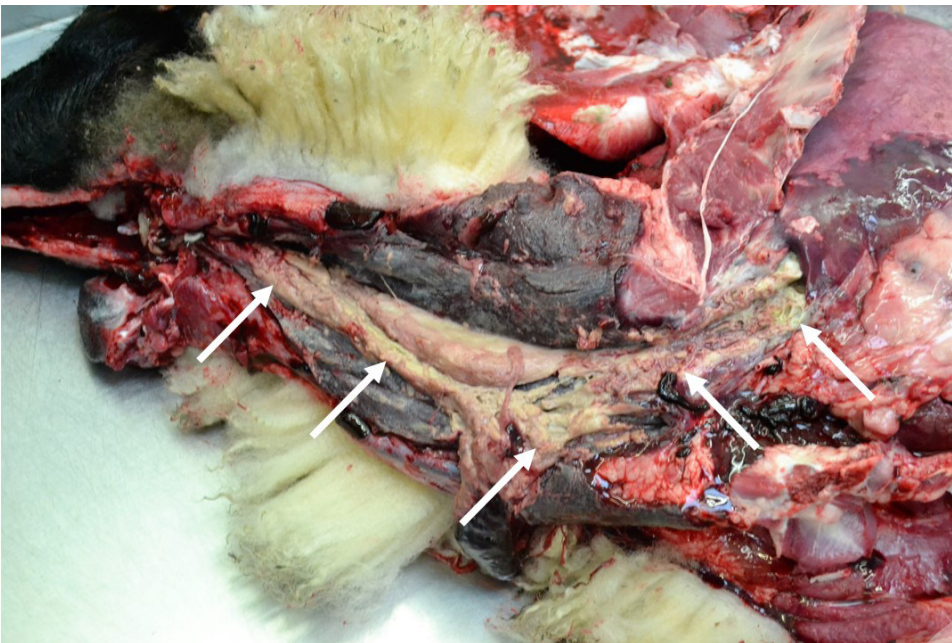
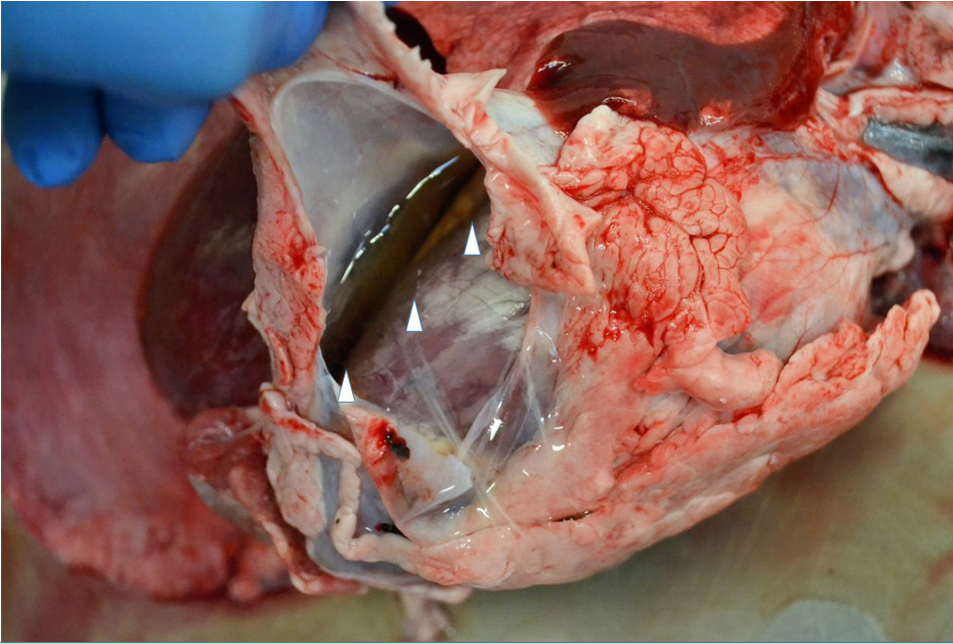


Figure 6

A necrotic tract in a lamb extending from the pharynx to the mediastinum. (White arrows mark the necrotic tract).

Systemic conditions

Three cases of clostridial enterotoxaemia (pulpy kidney) were detected in 4-6 month old lambs. Typically cases occurred in strong fast growing lambs at grass. At postmortem examination there was profuse amber coloured pericardial perfusion containing a gelatinous fibrinous clot and there were strands of fibrin in thoracic and abdominal cavities (figure 7). Epsilon toxin was detected in small intestinal content in each case.

**Figure 7**

Hydropericardium in a five-month-old lamb due to clostridial enterotoxaemia. (White arrowheads demark excess pericardial fluid).

Nervous disease

Cerebrocortical necrosis was diagnosed in five cases occurring in both lambs and adults. Affected cases presented with nervous signs. Diagnosis was based on histological findings.

PIGS:

Pituitary abscessation in pigs

Two cases of abscessation of the pituitary gland were recorded in pigs during the quarter. The cases were recorded in a five week old pig and in an eight to twelve week old pig. Both cases occurred in pigs from the same farm. *Trueperella pyogenes* was cultured from the pituitary abscess of both pigs. In the older pig there was an associated severe acute meningitis. Both pigs also had a significant pneumonia. Pituitary abscess syndrome is an uncommon condition believed to result from haematogenous spread of bacteria from established infections elsewhere in the body.

Salmonella Typhimurium in pigs

Salmonella Typhimurium was cultured in four cases, generally in cases associated with colitis or typhlitis. Affected pigs aged from five to 14 weeks.

OTHER SPECIES:

Tuberculosis was diagnosed in a one-year-old domestic cat from a rural area of N Ireland. This was one of a multi-cat household. The cat was in poor condition. The cat had been treated at a veterinary practice for a chronic respiratory infection. There was red-grey consolidation of anteroventral lungs with approximately 50% of lung volume affected. Discrete necrotic foci were not a feature however and although bronchomediastinal lymph nodes were enlarged focal necrosis was not grossly apparent. Histopathological examination of the lungs revealed multifocal to confluent mainly lymphogranulocytic inflammation with large macrophages and abundant lymphocytes. Neutrophils were present, mainly in the centres of granulocytic nodules, and there was marked alveolar oedema. Very numerous elongated acid-fast microorganisms were present associated with the granulocytic inflammation in Ziehl-Neelsen stained sections. These histological features were considered indicative of TB. *Mycobacterium bovis* was cultured from carcass lymph nodes.

Although tuberculosis due to *M bovis* is increasingly recognized in cats in Great Britain where it is most frequently seen in southwest England and Wales, in N Ireland it remains a rare and sporadic condition. From 1995 to 2018 in Northern Ireland 13 cats have been investigated as suspect TB with five of 13 confirmed positive. In Great Britain infected cats usually present with cutaneous lesions and/or lymphadenopathy. While the epidemiology of feline TB is still unclear it is considered that most cats become infected from bites from infected rodents when hunting. Cats can also become infected by ingestion or inhalation of *M bovis*. Cases of TB in cats in the UK are generally restricted to endemic bovine TB areas. TB in cats is a notifiable disease in N Ireland. In 2013 the joint Human Animal Infections and Risk Surveillance (HAIRS) group assessed the risk of transmission of *M bovis* from cats to humans as very low.

References:

1. Gunn-Moore, D.A., (2014) Feline tuberculosis caused by *Mycobacterium bovis*. *Veterinary Record*:174,13: 322-323
2. Human Animal Infections and Risk Surveillance (HAIRS) group. Qualitative assessment of the risk that cats infected with *Mycobacterium bovis* present to human health. <https://www.gov.uk/government/publications/hairs-risk-assessment-mycobacterium-bovis-in-cats>