

# Disease Surveillance and Investigation Branch DISEASE SURVEILLANCE REPORT

## Northern Ireland Disease Surveillance Report, April to June 2014

- Poisoning due to arsenic in cattle
- Poisoning due to lead in cattle
- Systemic pasteurellosis in lambs
- Enterotoxaemia in goats
- · LA-MRSA isolated from a piglet
- Avian TB in a crested partridge (roul roul)

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for April to June 2014

## CATTLE:

## Respiratory diseases

Respiratory disease was identified in 28 cattle post mortem submissions between April and June 2014. The most common pathogens identified included *Mannheimia haemolytica* (six cases), *Trueperella pyogenes* (five cases), *Mycoplasma bovis* (four cases) and *Pasteurella multocida (*four cases).

An adult suckler cow was submitted with a history of sudden death. Gross post-mortem examination showed marked oedema and haemorrhage in the sub cutis and muscles of the neck and a large sub-mucosal haematoma, (16 cm x 4.5cm in size) overlying the lumen of the trachea with ventral fracture of the cranial cartilage rings (Figure 1).



Figure 1

Tracheal cartilage ring fracture and haemorrhage in a heifer probably caused by crushing against a feed barrier It was postulated that this was a traumatic injury which had caused tracheal obstruction. Crushing against a feed barrier was considered to be a possible cause.

## Alimentary diseases

## BVD / Mucosal disease

Of 2651 blood samples that were tested for bovine viral diarrhoea virus (BVDV) by virus isolation or antigen capture ELISA 271 (10.2 per cent) were positive. In addition, 7 of 280 (2.5 per cent) submitted tissue and nasal mucus samples were positive by immunofluorescence. Two cases of mucosal disease were confirmed at post mortem examination during this period.

*Atresia ilei* was diagnosed in a three-day-old calf submitted with a history of fitting and foaming at the mouth. Gross post-mortem examination showed a collapsed and under-developed distal jejeunum, ileum, caecum and colon with sharp demarcation between the distended and collapsed jejunum (Figure 2). Test results for the presence of Schmallenberg virus nucleic acid by rt-PCR and antibody by ELISA were negative.



## Figure 2

Collapsed and underdeveloped sections of small intestine, caecum and colon in a threeday-old calf

Torsion of the reticulum, omasum and abomasum was diagnosed on gross post-mortem examination of a heifer calf submitted with a history of sudden death.

Necrotic enteritis and systemic mycosis was diagnosed in a three-month-old beef calf submitted with a history of profuse diarrhoea and pneumonia whilst at grass. Full post- mortem examination showed linear ulceration of the rugae of the abomasum and severe fibrinonecrotic enteritis with a 'towelling' effect present throughout the length of the small intestine mucosa with foci of thickening and haemorrhage. Histologically there was marked crypt abscessation with bacterial colonisation (mixed types including large rods) and presence of fungal hyphae, there was associated oedema of the submucosa and thrombosis of the submucosal blood vessels. There were scattered pale infarcts in the liver and histological examination showed the presence of fungal hyphae within thrombosed blood vessels. There was consolidation of around 25 per cent of the lung field and fibrinous tracheitis was detected. Fluorescent antibody test (FAT) and virus isolation results were negative for PI3, IBR, BRSV and BVDV and no significant bacteria were recovered from routine cultures. A diagnosis of necrotic enteritis and inter-current systemic mycosis and pneumonia was made. It was noted that necrotic enteritis is a disease of unknown cause which is occasionally seen in spring born sucked calves at grass.

## Arsenic poisoning in a group of heifers

Arsenic poisoning following access to copper acetoarsenite (Paris green) was diagnosed in a group of grazing heifers. Gross post-mortem examination showed marked abomasitis and rumenitis and arsenic was detected by the Reinsch test in the rumen contents. Arsenic levels in the liver were 13.3 ppm (acute toxic level: 2.0 - 15.0 ppm) and arsenic levels in kidney were 20.8 ppm (acute toxic level: 3.5 - 38.0 ppm). The statutory authorities were notified of the incident for further investigation.

## 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, April to June 2014

Dotheron	Number				
Pathogen	Tested	Positive ( per cent)			
Cryptosporidium species	342	100 (29.2%)			
Rotavirus	340	83 (24.4%)			
Coronavirus	348	28 (7.2%)			
Escherichia coli K99	130	2 (2.3%)			

## 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, April to June 2014

	Total	No of parasitic ova					
	Total	Negative	+	++	+++	++++	% positive
Liver fluke							
Bovine	661	553	75	26	3	4	16.3%
Ovine	238	214	17	4	1	2	10.1%
Paramphistome							
Bovine	705	425	95	114	37	34	39.7%
Ovine	237	210	10	9	4	4	11.4%
Coccidia							
Bovine	852	699	108	21	11	13	17.9%
Ovine	356	114	131	43	27	41	67.9%
Strongyle worm egg count	Total	<500 epg	≥500 epg			% Positive	
Bovine	821	763	58			7.1%	
Ovine	338	296	42			12.4%	

≥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 258 bovine faecal samples. 8 samples (3.1 per cent) contained acid-fast organisms typical of MAP. Of 5623 bovine blood samples that were tested for antibodies to MAP 454 (8.1 per cent) were positive.

## Nutritional and metabolic disease

Hypomagnesaemia was diagnosed in a three-month-old calf on the basis of a rib bone calcium: magnesium ratio of 148:1, the Ca: Mg ratio in normal calves is 55:1 while values over 90:1 indicate hypomagnesaemia. Endocardial masses on left ventricle consistent with mural endocarditis were also detected in this case but there was no evidence of embolic disease.

## Reproductive and mammary diseases Abortion

Specimens from 91 bovine abortions and stillbirths were examined during the 2nd quarter. Significant pathogens were detected in 37 cases (40.7 per cent). Of these, *Neospora caninum* (8 cases, 8.8 per cent) was the most commonly identified pathogen. Other pathogens identified included *Leptospira* Hardjo (7cases, 7.7 per cent), *T. pyogenes* (5 cases, 5.5 per cent), *Listeria monocytogenes* (3 cases, 3.3 per cent), BVDV (3 cases, 3.3 per cent), *E. coli* (3 cases, 3.3 per cent), *Salmonella* Dublin (3 cases, 3.3 per cent) and *Bacillus licheniformis* (3 cases, 3.3 per cent).

## Mastitis

A total of 491 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. 45 (9.2 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 27.5 per cent of isolates cultured. Other frequently identified organisms included Streptococcus uberis (16.3 per cent), Staphylococcus aureus (8.1 per cent), coagulase negative staphylococci (4.3 per cent), Bacillus cereus (3.5 per cent) and Streptococcus dysgalactiae (2.4 cent).

## Neurological diseases

Clostridium botulinum type C / D toxicosis was diagnosed in 8 cases during the 2nd quarter of 2014.

## Lead poisoning

Two instances of lead poisoning in cattle in different herds were investigated during the reporting period. A four- month- old calf died after showing blindness and a staggering gait. Gross findings were unremarkable but high levels of lead were detected in the kidney tissue (69.2  $\mu$ g / g: normal range 0.2 to 2.0  $\mu$ g / g). The remains of an old battery were found during a field walk.

In the other case a two-year-old cow was presented with acute nervous signs and mania. Numerous flecks of bright blue-green substance, possibly flakes of paint, were detected among the ruminal contents at necropsy. Kidney lead levels (200.0  $\mu$ g / g: normal range 0.2 to 2.0  $\mu$ g / g) were high. Three cows in total presented with signs consistent with lead poisoning. The animals had been pastured next to a water recreation facility and access to lead based boat paints was the presumed source of the toxicity.

## Urinary tract disease

Urolithiasis with secondary rupture of the bladder and uro-peritoneum was diagnosed at post-mortem examination of a one-year- old bull. There was thickening and swelling of the pelvic urethra and haemorrhage of the urethral mucosa at the sigmoid flexure with several hard calculi present. There was another 5-6 mm hard calculus at the tip of the penile urethra. The peritoneal cavity was filled with profuse blood tinged fluid which had a uraemic smell. Chemical analysis showed that magnesium and calcium ammonium phosphates were there predominant types of calculi present.

Lesions of renal dysplasia and nephrosclerosis were detected on full post-mortem examination of a six-weekold calf which died following dullness, depression and ill thrift from birth. Gross findings were unremarkable save for small and fibrous kidneys. Histological examination showed dysplastic and sclerosing lesions to be present in the kidney. There was tubule dilatation (ectasia) in some cases and some narrowing also. Glomeruli were present in a disorganised pattern and there was sclerosis of the glomerular basement membranes with glomerular atrophy. Masson's Trichrome and Elastin Van Giesson stains showed diffuse interstitial and especially peri-glomerular fibrosis. It was considered that these changes may have been consistent with a previously described juvenile nephropathy of unknown aetiology that occurs sporadically in calves in the UK.

## Other diseases of cattle

## Malignant catharral fever

Sheep associated malignant catharral fever due to infection with ovine herpes virus – 2 (OvHV-2) was confirmed in two groups of cattle in the same herd. The history indicated that co-grazing with sheep had taken place since the spring lambing. In all eight out of a total of one hundred animals died. Full gross post-mortem examination, histology, serology and OvHV-2 PCR were used to confirm the diagnosis.

## **SMALL RUMINANTS: SHEEP**

## **Respiratory diseases**

Respiratory disease was identified in 13 ovine post mortem submissions during this quarter. *M. haemolytica* pneumonia (seven cases), Jaagsiekte (three cases) and laryngeal chondritis (one case) were the most common diagnoses.

Laryngeal chondritis and secondary pulmonary abscessation was diagnosed in a three-year-old Texel ram. On gross examination there was severe cavitation and necrosis of the laryngeal cartilages and abscessation of the right cranial lung lobes. A profuse growth of *T. pyogenes* was recovered from the lung abscesses.

## Alimentary diseases

Abomasal dilatation, distension and rupture were diagnosed in a five-year-old Blackface ewe. No obvious cause(s) for the condition could be found on gross examination and tests for scrapie were negative. It was noted that the gross changes were similar to those seen in abomasal emptying defect which occurs in some lowland breeds of sheep. However, abomasal emptying defect, which is of unknown aetiology, has not been described in hill breeds.

## Enterotoxaemia in goats

Clostridial enterotoxaemia was diagnosed in an eight-month-old goat from a herd with a history of losses amongst kids following short episodes of severe diarrhoea. This doe had shown enteric signs prior to submission and had died suddenly. Small intestinal contents tested positive for *Clostridium perfringens* epsilon toxin most likely associated with *C. perfringens* type D enterotoxaemia in this case. It was considered that acute enterotoxaemia may also have been the cause of the losses amongst the kids in this herd.

#### Johne's disease

19 ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. No samples contained any acid-fast organisms typical of MAP. 5 ovine blood samples were tested for antibodies to MAP none of which were positive.

## Reproductive diseases Abortion

Specimens from 30 ovine abortions and stillbirths were examined during the 2nd quarter. Significant pathogens were detected in 21 cases (70 per cent). Pathogens identified included *Chlamydophilia abortus* (10 cases, 33.3 per cent) *Toxoplasama gondii* (7 cases, 23.3 per cent) and *B. licheniformis* (1 case, 3.3 per cent).

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## Neurological diseases

No cases of listeriosis were confirmed by post mortem examination during the 2nd quarter of 2014 C / D botulinum toxin was detected by ELISA after enrichment culture of caecal contents from a three-year-old ewe which was one of a group of seven post lambing ewes to die over a three day period.

## Cerebrocortical necrosis

Marked vesiculation of the cerebral grey matter, tracts of encephalomalacia with occasional macrophages present and laminar cerebrocortical necrosis were seen on histological examination of the brain of a three-month-old lamb. The histological changes seen in the brain were considered to be consistent with cerebrocortical necrosis. There was an inter-current parasitic gastroenteritis in this case.

## Skin diseases

No cases were examined for sheep scab during the 2nd quarter of 2014.

## Other diseases

Systemic pasteurellosis, due to Bibersteinia trehalosi infection was diagnosed in a six-week-old lamb which died following loss of condition. Pinpoint foci of necrosis were observed grossly in the liver and B. Trehalosi was recovered from multiple tissues. The lamb was also diarrhoeic and large numbers of coccidial oocysts were detected in the faeces and numerous coccidial stages were observed on histological examination of the small intestine.

## **HORSES**:

98 swabs were examined for the presence of Tayorella equigenitalis during this quarter, all of which were negative. 10 swabs were cultured from horses with a history suggestive of strangles during this quarter, all of which were negative.

#### PIGS;

Livestock – associated methicillin resistant *Staphylococcus aureus* (LA-MRSA) was recovered from the liver, lung and spleen of a pneumonic piglet. The piglet was one of a group of five six to eight – week – old piglets submitted with a history of pneumonia and wasting. There was a herd history of 10 per cent post-weaning mortality over a two to three month period. Gross post-mortem findings and histology were consistent with pneumonia. *P. multocida* and *Streptococcus suis* were recovered from routine cultures and European strain porcine reproductive and respiratory syndrome virus (PRRSV) nucleic acids were detected by PCR in tissues from piglets in the group. The MRSA was considered to be an incidental finding and infection with PRRSV was considered to be the main disease factor in this case. This is believed to be the first reported isolation of LA-MRSA from a pig in the UK.

#### WILDLIFE and EXOTICS:

Avian tuberculosis, hepatic amyloidosis and *Heterakis gallinarum* infection were diagnosed in a crested partridge (roul-roul) submitted from a zoological collection. On gross examination there was significant pathology in the liver with the presence of multiple, discrete, mineralised granulomatous lesions. Histological examination of the liver showed extensive infiltration with a pink amorphous substance, focal aggregations of haemosiderinophages and extensive focal pyogranulomas with fibrous encapsulation. Ziehl – Neelsen (ZN) stained sections showed the presence of large numbers of acid fast organisms within the necrotic granulomatous lesions. Congo red stained sections confirmed the amorphous infiltrating substance to be amyloid.