

Northern Ireland Disease Surveillance Report, 1st January to 31st March 2012

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1st January to 31st March 2012.

- Pulmonary bovine tuberculosis in a heifer
- Abomasal soft tissue sarcoma in a three-year-old cow
- White muscle disease in a one-week-old Charolais bull calf
- Cerebrocortical necrosis in a six-week-old lamb with a history of blindness and circling
- *Listeria monocytogenes* septicaemia in a nine-month-old llama

CATTLE:

Respiratory diseases

Respiratory disease was identified in 88 cattle post-mortem submissions between January and March 2012. The most common pathogens identified included *Mycoplasma bovis* (15 cases), *Pasteurella multocida* (11 cases), *Mannheimia haemolytica* (11 cases), *Trueperella* (formerly *Arcanobacterium*) *pyogenes* (11 cases), Infectious Bovine Rhinotracheitis (five cases) and Respiratory syncytial virus (three cases).

Pulmonary bovine tuberculosis in a heifer. Tubercloid granuloma lesions were detected histologically and confirmed by Ziehl-Neelsen staining in a one-year-old heifer submitted with a history of recumbency and breathing difficulties. Due to the limited extent of the lesions, bovine tuberculosis was not considered to have been the primary cause of death in this case.

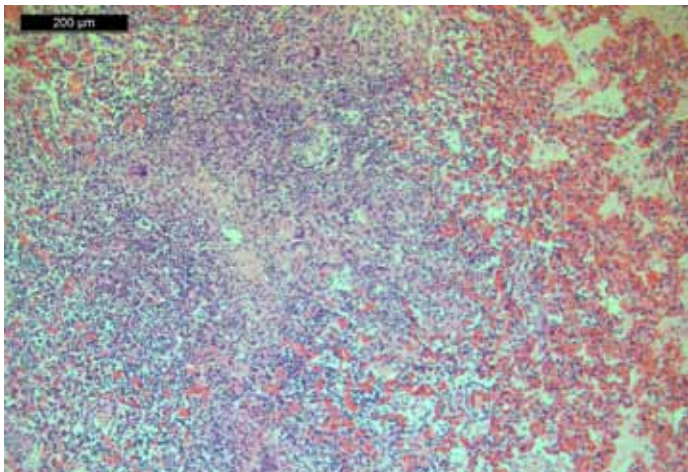


Figure 1: Histological lesion of pulmonary tubercloid granuloma in a one-year-old heifer. 10 x magnification, haematoxylin and eosin stain.

Alimentary diseases

BVD / Mucosal disease

Of 7093 blood samples that were tested for bovine viral diarrhoea virus (BVDV) by virus isolation or antigen capture ELISA 459 (6.5 per cent) were positive. In addition, 30 of 424 (7.1 per cent) submitted tissues and nasal mucus samples were positive by immunofluorescence. Thirteen cases of mucosal disease were confirmed at post-mortem examination during this period.

Abomasal soft tissue sarcoma

An abomasal soft tissue sarcoma was diagnosed in a three-year-old cow that was three weeks calved with a history of chronic weight loss. The mural mass had resulted in thickening and obstruction of the abomasal pyloric area. The rumen and abomasum were distended with watery, blood-stained content, while the small intestine was collapsed with scant content.

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, January to March 2012

Pathogen	Number	
	Tested	Positive (%)
<i>Cryptosporidium</i> species	226	44 (19.6%)
Rotavirus	666	194 (29.1%)
Coronavirus	666	46 (6.9%)
<i>Escherichia coli</i> K99	243	22 (9.0%)

Other enteric conditions

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

Johne's disease

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 343 bovine faecal samples. Seventeen samples (5 per cent) contained acid-fast organisms typical of MAP. Of 8540 bovine blood samples that were tested for antibodies to MAP 705 (8.3 per cent) were positive.

TABLE 2: Endoparasitic infections in ruminants in Northern Ireland, January to March 2012

	No of parasitic ova						% positive
	Total	Negative	+	++	+++	++++	
Liver fluke							
Bovine	818	734	64	16	3	1	10.3%
Ovine	248	213	23	6	4	2	14.1%
Paramphistome							
Bovine	820	494	160	124	34	8	39.7%
Ovine	247	196	41	7	3	0	20.6%
Coccidia							
Bovine	936	839	75	14	5	3	10.4%
Ovine	269	75	165	13	10	6	72.1%
Strongyle worm egg count							
		<500 epg	≥500 epg				
Bovine	910	891	19				2.1%
Ovine	262	238	24				9.2%

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

Reproductive and mammary diseases

Abortion

Specimens from 249 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 119 cases (47.8 per cent).

Of these, *Trueperella pyogenes* (24 cases, 9.6 per cent) and *Leptospira* Hardjo (24 cases, 9.6 per cent) were the most commonly identified pathogens.

Other pathogens identified included:

Bacillus licheniformis (22 cases, 8.8 per cent), BVDV (15 cases, 6.0 per cent), *Neospora caninum* (14 cases, 5.6 per cent) and *Escherichia coli* (10 cases, 4.1 per cent).

Mastitis

A total of 529 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. 54 (10.2 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 61 samples. *E. coli* was the most frequently isolated organism and accounted for 22.9 per cent of isolates cultured.

Other frequently identified organisms included:

Streptococcus uberis (15.7 per cent), *Staphylococcus aureus* (8.1 per cent), *Streptococcus* species (7.0 per cent), *Streptococcus dysgalactiae* (6.0 per cent), *Streptococcus* alpha-haemolytic (4.9 per cent) and Non-haem *Staphylococcus* species. (4.7 per cent).

Bovine Neonatal Pancytopenia

A total of six cases of bovine neonatal pancytopenia (BNP) were diagnosed during the reporting period.

Urinary Tract Diseases

A ruptured bladder, uroperitoneum and hydronephrosis associated with urethral obstruction due to penile swelling were detected in a one-week-old male calf with a history of sudden onset lethargy and laboured breathing.

The carcass was dehydrated and the abdominal cavity contained fluid with a urine-like smell. The dorsal wall of the urinary bladder had a tear with associated haemorrhage and from which urine was leaking. The urethra was distended by urine to the level of the sigmoid flexure where the penis was swollen and haemorrhagic.

The kidneys were enlarged to twice normal size with dilation of the renal pelvises by urine and compression of medulla and cortex. Trauma to the penis was postulated as the underlying cause. Cystitis, pyelonephritis and chronic renal urolithiasis along with acute peritonitis were detected in a 14-month-old bull presented for post-mortem examination with a history of short recumbency and death following fighting among the pen of bulls.

On post-mortem examination there was copious foetid peritoneal fluid and the abdominal viscera were coated with fibrinous tags. The bladder was turgid and distended to 25 cm in diameter. The bladder wall was thickened and congested while the thickened bladder mucosa was coated with fibrin and creamy mineral concretions up to 3 mm in diameter. Both kidneys were markedly enlarged, pale and firm with multiple creamy, raised foci 2-3 mm in diameter on the capsular surface. The renal pelvises were dilated and plugged by numerous mineralised particles.

Other Diseases

White muscle disease

White muscle disease was diagnosed in a one-week-old Charolais bull calf with a history of ill thrift and scour. At post-mortem examination there were multifocal areas of myocardial pallor which were histologically characterised as multifocal to coalescing severe cardiomyofibre degeneration, necrosis and mineralisation with infiltration of macrophages and marked fibrosis.

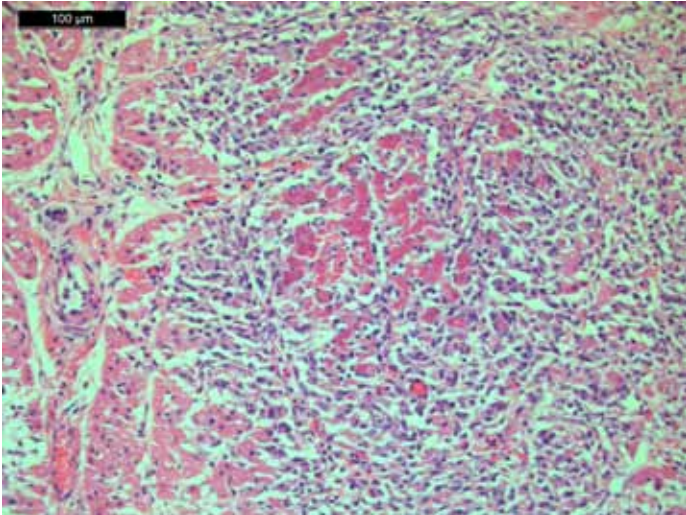


Figure 2: Histological lesions of white muscle disease in the heart of a one-week-old calf. 20 x magnification, haematoxylin and eosin stain.

Vitamin E levels (2.8 µg per g liver) (normal range >1 µg per g liver) were within normal expected range. Selenium levels (0.73 µg per g kidney) (normal range 0.9-3 µg per g kidney) were in the marginal range.

Lead poisoning

Lead poisoning was detected in a 10-year-old cow submitted for necropsy with a history of four cohort animals presenting with nervous signs including; head pressing and excessive salivation. Kidney lead levels were 57.0 µg per g. Kidney lead levels greater than 25 µg per g are considered toxic.

SMALL RUMINANTS:

Respiratory diseases

Respiratory disease was identified in 23 ovine post-mortem submissions during this quarter. Jaagsiekte (seven cases), fibrinous pleurisy (six cases) and *Mannheimia haemolytica* (two cases) were the most common diagnoses.

Mycoplasma ovipneumoniae pneumonia was detected in a one-year-old ewe that was presented for post-mortem examination following sudden death. On gross post-mortem examination there was generalised pulmonary congestion and oedema. Histologically there was marked diffuse hyperplasia of bronchiolar associated lymphatic tissue and occasional alveoli and bronchioles contained degenerate neutrophils. *Mycoplasma ovipneumoniae* infection was confirmed by immunohistochemistry.

Johne's disease

Three ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. No samples contained acid-fast organisms typical of MAP. Twelve ovine blood samples were tested for antibodies to MAP, three (25 per cent) of which were positive.

Reproductive diseases

Specimens from 311 ovine abortions and stillbirths were examined during the 1st quarter. Significant pathogens were detected in 188 cases (60.5 per cent). Pathogens identified included:

Toxoplasmosis (79 cases, 25.4 per cent), *Chlamydophila* (59 cases, 19.0%), Leptospirosis (20 cases, 6.4 per cent), *Escherichia coli* (18 cases, 5.8 per cent), Listeriosis (11 cases, 3.5 per cent), *Trueperella pyogenes* (nine cases, 2.9 per cent) and *Salmonella* Dublin (nine cases, 2.9 per cent).

Neurological Diseases

Cerebrocortical necrosis (polioencephalomalacia) was diagnosed in a six-week-old lamb with a history of blindness and circling. On post-mortem examination there was coning of the cerebellum and flattening of the cerebral gyri. There was multifocal autofluorescence in the cerebral cortex under ultraviolet light (Wood's lamp).



Figure 3: Gross lesions of cerebellar coning and brain swelling in a six-week-old lamb with cerebrocortical necrosis.

Histologically laminar rarefaction in the cerebral cortex along with, neuronal necrosis, hypertrophy of endothelium and occasional non-suppurative perivascular cuffs were detected.

Other diseases

Pulpy kidney disease

Pulpy kidney disease was detected in a two-day-old lamb with a history of fever and spasm followed by death. On post-mortem examination there was copious pericardial fluid and the kidneys were soft and friable. *Clostridium perfringens* epsilon toxin was detected in small intestine content.

Pieris poisoning

Pieris species poisoning was detected in a 10 month old ewe lamb that presented for post-mortem

examination with a history of sudden death while at pasture. On examination the rumen was distended with frothy contents and contained leaf fragments consistent with *Pieris*, which is highly toxic for animals.

PIGS

Respiratory diseases

Actinobacillus pleuropneumonia serotype 7 pneumonia was detected in a four-month-old pig that presented with a history of sudden death from a unit experiencing increased death in this age group of pigs.

At post-mortem examination there was haemorrhagic consolidation throughout cranio-ventral and caudo-dorsal lung lobes and fibrinous pleurisy. Histologically a severe fibrinonecrotic bronchopneumonia with oat-cells and perivascular neutrophil cuffing along with bacterial colonies was detected. The bacteria were identified as *A. pleuropneumonia* serotype 7.

Other diseases

Porcine dermatitis and nephropathy syndrome was detected in two 20-week-old pigs with a history of wasting and Porcine Circovirus 2 (PCV-2) vaccination.

On post-mortem examination there were numerous multifocal to coalescent red skin lesions, with central craters, concentrated on the hindquarters and shoulders. The kidneys were enlarged with multiple subcapsular petechiae. Mesenteric lymph nodes were enlarged. Histologically the iliac lymph node had acute lymphadenitis with necrosis of germinal centres and presence of numerous multinucleate macrophages. The skin had focal necrosis of dermal collagen associated with lymphogranulocytic inflammation, perivascular oedema and haemorrhage. PCV-2 was not detected by immunofluorescence but the pathological changes seen in PDNS often develop after viral antigen has disappeared.

HORSES:

176 swabs were examined for the presence of *Tayorella equigenitalis* during this quarter, all of which were negative. One swab was cultured from a horse with a history suggestive of strangles, the result was negative.

MISCELLANEOUS

Flying fox

Yersiniosis was detected in a Rodrigues flying fox (*Pteropus rodricensis*) submitted for post-mortem examination. There were no significant findings on gross post-mortem examination. However, acute necrotizing hepatitis with associated bacterial colonies was detected histologically. *Yersinia pseudotuberculosis* was cultured from multiple organs.

Llama

Listeria monocytogenes septicaemia was detected in a nine-month-old llama submitted with a history of sudden death. On post-mortem examination, excess pericardial fluid and epicardial haemorrhages along with copious fluid in abdominal cavity were detected. *Listeria monocytogenes* was cultured from multiple organs.

This summary has been compiled by the Veterinary Sciences Division of the Agri-Food and Biosciences Institute (AFBI*) of Northern Ireland and is based on diagnostic submissions to AFBI's veterinary laboratories at Stormont, Belfast, and Omagh, Co Tyrone. <http://www.afbini.gov.uk/index/services/diagnostic/adds.htm>

*AFBI was created on 1st April 2006 as the amalgamation of DARD Science Service and the Agricultural Research Institute of Northern Ireland. AFBI operates a farm animal disease diagnostic service on behalf of the Department of Agriculture and Rural Development for Northern Ireland.