

Northern Ireland disease surveillance Quarterly Report

January-March 2009 Vol 5 No. 1

Northern Ireland Disease Surveillance Report, January to March 2009

- Septicaemic listeriosis in neonatal calves
- Fasciolosis in sheep
- Posterior paralysis in lambs
- Oedema disease in pigs
- Yew poisoning in a horse

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report, January to March 2009.

CATTLE:

Respiratory diseases

Respiratory disease was identified in 81 cattle postmortem submissions between January and March 2009. Pathogens identified included *Mycoplasma bovis* (thirteen cases), *Pasteurella multocida* (twelve cases), *Mannheimia haemolytica* (twelve cases), *Arcanobacterium pyogenes* (eleven cases) *Histophilus somni* (eight cases), bovine herpes virus 1 (BHV1) (seven cases) and bovine respiratory syncytial virus (BRSV) (one case).

Pneumonia due to *M. bovis* was commonly diagnosed during this quarter. One case involved a one-month-old dairy calf that had died suddenly. On postmortem examination the cranial lung lobes were consolidated. Acute bronchointerstitial pneumonia, with occasional bronchiolar epithelial syncytia, was seen histologically. Antigen capture ELISA and immunofluorescence tests were positive for *M. bovis* and BRSV respectively. *M. bovis* pneumonia was also seen in a two-week-old calf which had diarrhoea and dysphoea. Two other calves with similar clinical signs had died within the previous two weeks. On postmortem examination a severe acute necrotising bronchopneumonia with bronchiectasis and early abscessation affecting approximately 40 per cent of the cranioventral lung lobes was seen. M. bovis antigen was demonstrated in the lung tissue. A two-day-old calf that died suddenly was examined. Three other calves in this batch had died within the previous few weeks. On postmortem examination approximately 40 per cent of the lung tissue was consolidated, and histopathological changes characteristic of fibrinonecrotic bronchopneumonia due to *M. haemolytica* infection were seen. M.haemolytica serotype A6 was isolated in pure culture from the lung tissue. BHV1 antigens were also identified by immunofluorescence, although there was no evidence of haemorrhage or necrosis in the upper respiratory tract.

Alimentary diseases BVD / Mucosal disease

A total of 655 blood samples were tested by virus isolation or antigen capture ELISA for bovine viral diarrhoea virus (BVDV), of which 70 (10.7 per cent) were positive. In addition, 384 submitted tissues and nasal mucus samples were tested by immunofluorescence for BVDV, with 21 (5.5 per cent) being found positive. Seven cases of BVDV/mucosal disease were confirmed on postmortem examination during the quarter. One case involved a six-week-old Welsh Black calf that had died suddenly. On post mortem examination there was a torsion of the abomasum. Diffuse peritonitis with multiple abomasal ulcers and a large perforation in the abomasal wall were also present. Immunofluorescence for BVDV was positive on tissues from the abomasum, spleen and mesenteric lymph nodes.

On postmortem examination of a 15-month-old bull there were fibrinous adhesions between the abomasum and diaphragm with perforation of both the abomasum and diaphragm. Large amounts of altered blood and some abomasal content were present in the thoracic cavity. There was a limited amount of leakage of abomasal contents into the abdomen. Histological examination of the liver revealed acute centrilobular to mid-zonal necrosis, consistent with acute heart failure. Haemorrhagic abomasal ulceration was seen on postmortem examination of a 27-month-old cow that died on the same premises a few days earlier.

Torsion of the reticulum and abomasum was present on postmortem examination of a six-month-old female Limousin calf which died 24 hours after being dull and recumbent (Figure 1). The calf also had a partial rectal prolapse.



Figure 1. Torsion of the reticulum and abomasum in a calf

Neonatal enteritis

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

Escherichia coli, which tested positive for the K99 antigen, was detected on postmortem examination in the intestinal contents of a two-day-old calf that had diarrhoea. Three other deaths had occurred in this batch of calves, whose dams were first calving heifers.

TABLE 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, January to March 2009.

	Number					
Pathogen	Tested	Positive (per cent)				
Cryptosporidium species	678	265 (39.1%)				
Rotavirus	641	192 (30.0%)				
Coronavirus	655	17 (2.6%)				
Escherichia coli K99	280	8 (2.9%)				

*Samples were mainly submitted from neonatal calves, although the age was not always given.

Other enteric conditions

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

Table 2, below.

Table 2: Endoparasitic infections in ruminants in Northern Ireland, January to March 2009.

		Ν					
	Total	Negative	+	++	+++	++++	% positive
Liver fluke							
Bovine	544	431	74	29	8	2	20.8%
Ovine	186	152	14	14	1	5	18.3%
Coccidia							
Bovine	781	634	108	20	10	9	18.8%
Ovine	218	96	85	17	10	10	56.0%
Strongyle worm egg count		<500 epg	≥500 epg				
Bovine	214	205	9			4.2%	
Ovine	212	184	28				13.2%

*>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 microscopy, with Ziehl-Neelsen staining, on 319 bovine faecal samples. Twelve samples (3.8 per cent) contained acid-fast organisms typical of MAP. A total of 2029 bovine blood samples were tested for antibodies to MAP, of which 196 samples (9.7 per cent) were positive.

Reproductive and mammary diseases Abortion

Specimens from 164 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 80 cases (48.8 per cent). Of these, *Leptospira* Hardjo and *Bacillus licheniformis* were the most commonly identified pathogens, and were detected in 17 cases each (10.4 per cent of cases). Other pathogens identified included *Arcanobacterium pyogenes* (15 cases, 9.1 per cent), BVDV (15 cases, 9.1 per cent), *E. coli* (7 cases, 4.3 per cent), *Salmonella* Dublin (3 cases, 1.8 per cent), *Listeria monocytogenes* (3 cases, 1.8 per cent), *Aspergillus* species (3 cases, 1.8 per cent) and *Neospora caninum* (2 cases, 1.2 per cent),

Mastitis

A total of 791 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. Sixty (7.6 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 130 samples. *E. coli* was the most frequently isolated organism and accounted for 22.5 per cent of isolates cultured. Other frequently identified organisms included *Streptococcus uberis* (15.8 per cent of isolates), *Enterococcus* species. (8.9 per cent), *Staphylococcus aureus* (8.7 per cent), *Streptococcus dysgalactiae* (4.6per cent), *Pseudomonas species* (6.5 per cent) and other *Staphylococcus* species (5.11 per cent).

A field visit was carried out in March to investigate a dairy herd with a clinical mastitis incidence rate of 72 cases per 100 cows per year and increased prevalence of mastitis in the late winter housing period with a high incidence of recurrent cases.

Rolling average bulk milk cell count for milk supplied during the three months prior to the visit was 230,000 cells per ml with total bacterial counts (TBC) fluctuating between 18,000 and 80,000 per ml. *S. uberis* was the most prevalent pathogen isolated from samples taken during the visit. A significant number of *Corynebacterium bovis* udder infections were also detected.

Observations made during sample collection included poor teat preparation prior to cluster application, clusters applied without prior stimulation to induce milk let-down, over-milking and significant teat end hyperkeratosis (> 20per cent of teats had very rough hyperkeratosis). Hygiene of treatment devices was very poor. Freshly milked high-yielding cows were being crowded into a very small, dirty yard for several hours post-milking due to on-going renovations in the collecting yard. Cubicle hygiene was also poor, particularly for dry cows.

Further investigation revealed that liners had done 5,000-6,000 milkings and had not been

replaced. It is recommended that liners be replaced after 2,500 milkings.

Recommendations arising from the field visit included improvements in parlour routine; pre-dipping and use of individual dry paper towel wipe prior to cluster application; instruction on sterile preparation of the teat end prior to introduction of treatment devices; increasing the automatic cluster removal take-off flow rate threshold and improvements in teat disinfection post-milking.

An extended antibiotic treatment regimen was applied to confirmed *S. uberis* cases as recommended by the veterinary practitioner. More frequent cleaning and bedding of cubicles and improvements in cow flow out of the parlour were also implemented. More frequent changing of liners on the parlour was also recommended. A reduction in clinical mastitis incidence was observed after implementation of pre-dipping and improvements in cubicle hygiene and cow flow.

Neurological diseases

A four-month-old calf which had been in lateral recumbency, unable to rise and had its legs extended was blood sampled and euthanased prior to postmortem examination. The erythrocyte transketolase test showed a 486 per cent increase (normal range < 95 per cent). Lesions typical of cerebrocortical necrosis were seen on histology.

Choke and listeriosis was diagnosed in a one-year-old bullock that was found dead. A large bolus of course silage cud was found occluding the larynx. Histological lesions in the brainstem typical of listeriosis were present. An incidental finding was that a large number of paramphistomes that were present on ruminal mucosa.

Other diseases

On post-mortem examination of a four-day-old calf the carcase was found to be congested and dehydrated, with grey scour soiling the hindquarters. *L. monocytogenes* was isolated in a septicaemic pattern including the joints, with large numbers of organisms cultured from the mesenteric lymph nodes. The calf was one of a batch of 12 in calving pens which were being fed fresh milk.

Listerial septicaemia was also diagnosed in a five-day-old calf that was submitted for post mortem examination with a history of enteritis. Gross postmortem examination confirmed enteritis with a diptheritic exudate adhered to the mucosal surface of the distal ileum. *L. monocytogenes* was isolated from the lungs, liver and spleen.

SMALL RUMINANTS:

Respiratory diseases

Respiratory disease was identified in twelve ovine postmortem submissions during the quarter. Laryngeal chondritis (three cases) was the most common diagnosis. Jaagsiekte (two cases) and *Pasteurella multocida* (one case) were also detected at postmortem examination.

Laryngeal chondritis was diagnosed in a three-week-old lamb that presented with sudden onset dyspnoea. *A. pyogenes* was cultured from the abscessed arytenoid cartilages. A chain of bony exostoses affecting both sides of the ribcage midway between the costochondral and costovertebral junctions was present. These lesions may have been due to dystocia.

Alimentary diseases

Fasciolosis was diagnosed on postmortem examination of 16 sheep from separate premises during this quarter.

One case involved a one-year-old lamb that had died after a short period of inappetence. Several other deaths had occurred in this batch of lambs. On postmortem examination the carcase was very thin. Subcutaneous oedema was present and the body cavity contained copious amounts of serosanguinous ascitic fluid. The liver was shrunken, fibrotic and had a nodular surface. Many haemorrhagic tracts were seen in the liver and the distended bile ducts contained numerous adult fluke. Over 250 adult *Fasciola hepatica* were recovered from the liver.

Eight cases of coccidiosis were diagnosed at postmortem examination during this quarter. One case involved a seven-week-old lamb that was found collapsed at pasture with haemorrhagic diarrhoea. The lamb died a short time later. Coccidiosis was diagnosed on the basis of typical intestinal histological lesions and the detection of oocysts in faeces.

Johne's disease

Eleven ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP, all samples were negative. One ovine blood sample was tested for antibodies to MAP; the sample was positive.

Reproductive diseases

Specimens from 168 ovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 96 cases (57.1 per cent). Of these, Toxoplasmosis was the most commonly identified pathogen and was detected in 41 cases (24.4 per cent of cases). Other pathogens identified included *Chlamydophila abortus* 33 cases (19.6 per cent of cases), *Leptospira* (20 cases, 11.9 per cent) and *Campylobacter* (4 cases 2.4 per cent).

Five aborted lambs from different ewes and afterbirth were submitted for examination. The abortions all occurred within two days, one to two weeks before lambing.

The carcases were autolytic and one foetus had been scavenged. A placentitis was seen histologically. *Campylobacter fetus fetus* was recovered from all abortion material submitted. No other infectious agents were detected.

Neurological diseases

Nine cases of listeriosis were confirmed by postmortem examination during the 1st quarter of 2009.

A four-year-old ewe, one month before lambing, was found collapsed with marked twisting of the neck. The ewe was unresponsive to antimicrobial therapy and was subsequently euthanased. On histological examination of the brain, lesions characteristic of listeriosis were found in the brainstem. A moderate to severe lymphocytic meningitis was also present. The causative micro-organism was not isolated in this case.

Two four-week-old lambs were submitted with a history of posterior paresis, which did not respond to antimicrobial and steroid therapy. The tails of both lambs had been docked. No lesions were detected on postmortem examination of the spinal canal. However, when the cord of one of the lambs was transected a small area of discolouration was noted in the centre of the lumbar cord. An area of abscessation obliterating the grey matter was seen histologically. Low numbers of neutrophils were present in the brain tissue around the ventricles, probably reflecting spread of inflammation up the central canal of the spinal cord.

Skin diseases

Three cases of sheep scab were confirmed during the 1st quarter of 2009.

PIGS:

Alimentary diseases

Twenty six-week-old pigs on a high health unit were found dead. The pigs had been weaned 10-14 days previously. On postmortem examination pronounced oedema of the greater curvature of the stomach (Figure 2)



Figure 2. Gut oedema disease in the stomach of a pig

and periorbital oedema were seen. These postmortem findings are typical of gut oedema disease. *E. coli*, serotypes O78, O20 and O141, were isolated from the pigs. All these serotypes have previously been associated with gut oedema of pigs.

Gut oedema was first described at VSD, then VRL Stormont, by Shanks and Lamont in 1938 (VR, 1938, 50, 356-7). However, the disease has been infrequently diagnosed in recent years.

Neurological diseases

Two ten-week-old pigs were submitted for postmortem examination with a history of neurological signs followed rapidly by death. Histology of brain tissue revealed meningoencephalitis with oedema and eosinophil accumulations around the blood vessels of the cerebral cortex and meninges with laminar malacia of cerebral cortex. These lesions are typical of salt poisoning. There had been severe night-time frost in the few nights prior to the deaths and frozen water pipes were thought to have interrupted the water supply.

BIRDS:

Formalin-fixed brain and peripheral nerves were submitted for examination from backyard bantam chickens that were showing neurological signs. Occasional perivascular monocytic foci were noted in the cerebrum and there was lymphocytic infiltration of peripheral nerve with presence of frequent large intensely basophilic cells. These features are suggestive of Marek's disease.

A three-year-old Harris hawk was found dead. On postmortem examination the liver had an irregular pale appearance. Severe acute hepatocyte necrosis was seen histologically. A number of hepatocytes had eosinophilic intranuclear inclusions with nuclear margination. A moderate cholangiohepatitis with mainly lymphocytic infiltrate, but also plasma cells, macrophages and heterophils was also present. The most likely cause was adenovirus infection.

An eight-month-old duck, from a back yard flock of 30 laying ducks, died after a short illness. Several ducks in this flock had developed inappetence and became recumbent for several days prior to death. On postmortem examination foreign body peritonitis was present (Figure 3). Numerous pieces of wire and metal had perforated the gizzard. The flock had been housed at night on wood shavings produced from reclaimed timber, which contained numerous pieces of wire and metal. The bedding was replaced with shavings containing no metal fragments and deaths have since ceased.



Figure 3. Metal fragments in the gizzard of an eight-month-old duck

HORSES:

Three hundred and sixty-seven blood samples were submitted for serology for equine viral arteritis by virus neutralisation test, 6 of which were positive from 5 different premises. All 229 swabs that were examined for the presence of *Tayorella equigenitalis* were negative. Two swabs were cultured from horses with a history suggestive of strangles, both of which were negative.

Nine postmortem cases were examined this quarter inclusive of five foetuses and one stillbirth. Significant cases included an abortion due to a possible foetal abnormality. This was diagnosed in a foetus that aborted six weeks before term. At postmortem examination there was severe abdominal haemorrhage associated with a ruptured cyst-like structure. The cyst was approximately 14cm in diameter, was attached to the liver and contained friable red material. There was also a fracture of the spine at the thoraco-lumbar junction.

Two foetuses from different premises were submitted for postmortem examination. In both cases a profuse growth of *Streptococcus zooepidemicus* was recovered from the tissues cultured.

A two-year-old horse with a history of sudden death was submitted for postmortem examination. There was an acute fibrinous peritonitis with digesta free within the abdominal cavity. A full 360 degree torsion of the small intestines with a partial torsion of the large intestine and caecum was present. The source of the digesta was not identified.

A two-year-old horse with a history of swollen lymph nodes was submitted for postmortem examination. A large abscess containing purulent material, surrounding the tracheal cartilages at the level of the thoracic inlet, was present. The position of the abscess at this point was causing compression of the trachea. A pure growth of *Streptococcus equisimilis* was isolated from abscess swabs.

Yew tree poisoning was diagnosed in an eleven-year-old horse which had previously broken out of its enclosure into a neighbouring paddock which contained a yew tree. At postmortem examination numerous fragments of yew tree leaves were present in the stomach. 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.