

Disease Surveillance and Investigation Branch

Northern Ireland Disease Surveillance Report,
1st April to 30th June 2011

- Atresia ilei in calves
- Babesiosis in cattle
- Botulism in sheep
- Copper poisoning in sheep
- Multicentric leukaemic lymphoma in a pig
- Circovirus infection in pigeons

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1st April to 30th June 2011

CATTLE:

Respiratory diseases

Respiratory disease was identified in 61 cattle postmortem submissions between April and June 2011.

The most common pathogens identified included *Pasteurella multocida* (18 cases), *Arcanobacterium pyogenes* (12 cases), *Mannheimia haemolytica* (eight cases), *Mycoplasma bovis* (four cases) and infectious bovine rhinotracheitis virus (IBRV) (three cases).

Malignant catarrhal fever was diagnosed in an eighteen-month-old heifer on the basis of gross necropsy, histopathology and serology. Widespread non-suppurative necrotising vasculitis was detected in all areas of the brain and brainstem. The animal was seropositive for malignant catarrhal fever.

Pneumonia and fibrinous pleurisy were diagnosed in a four-week-old suckler calf with a history of ill thrift and multiple treatments with different antimicrobials. *A. pyogenes* was recovered from the pleural fluid. The lung tissue was positive for *M. bovis* antigen and bovine virus diarrhoea virus (BVDV) antigen.

Shipping Fever was diagnosed in a three-month-old dairy-cross calf, one of a group of 13 that had

been purchased at market and then transported the previous day. *M. haemolytica* serotype A2 was recovered in septicaemic distribution.

A two-month-old calf was submitted for necropsy following death with respiratory signs. Postmortem examination showed haemorrhagic consolidation in a lobular pattern throughout all lung lobes. Multiple foci of acute, necrotising, suppurative bronchopneumonia with numerous fungal hyphae in and around the lesions was observed on histological examination of the lung tissue. It was suggested that mouldy feed or bedding was the most likely source of the fungal infection.

Alimentary diseases

BVD / Mucosal disease

Of 3084 blood samples that were tested for BVDV by virus isolation or antigen capture ELISA 213 (6.9 per cent) were positive. In addition, 12 of 262 (4.6 per cent) submitted tissues and nasal mucus samples were positive by immunofluorescence. Three cases of mucosal disease were confirmed at postmortem examination during this period.

Atresia ilei

A two-day-old calf was submitted for necropsy with a history of sudden death. Postmortem examination showed atresia of a 10 cm segment of the ileum. The small intestine proximal to the atresia was dilated by yellow-brown coloured fluid. The ileum and large intestine distal to the atresia were empty.

Intestinal torsion was diagnosed in an eighteen-month-old heifer which had been found recumbent and unresponsive to treatment.

Abomasitis and reticulitis in calves

Clostridium sordellii abomasitis with perforation and secondary peritonitis was diagnosed in a twenty-four-month old cow submitted during April. Tissues from the abomasum and spleen were negative for the presence of BVDV antigen by immunofluorescence.

A four-week-old heifer calf was submitted for necropsy following dysentery and death. Gross postmortem examination and histopathology showed severe invasive fungal reticulitis, rumenitis and abomasitis with vasculitis and infarction of the abomasum and reticulum (Figure 1). *Aspergillus fumigatus* was cultured from the reticulum.

Abomasitis and peritonitis due to *Mannheimia septicaemia* were diagnosed in a two-month-old calf. Tissues from the abomasum, mesenteric lymph node and spleen were negative for bovine virus diarrhoea virus (BVDV) antigen by immunofluorescence.

Chronic hepatic fibrosis in a calf

A three-month-old suckler calf was submitted and at necropsy the main gross findings were of jaundice and hepatic enlargement and discoloration. Histologically there was severe disruption of hepatic architecture with hepatic degeneration, necrosis and bridging fibrosis along with bile duct hyperplasia. The lesions affected 50-70% of the hepatic parenchyma. The histological lesions were considered to represent chronic active fibrosing hepatitis and the extent of the lesions was considered to be consistent with jaundice and death due to hepatic failure. A definitive cause of these lesions was not identified; differentials would include chronic salmonellosis.

Neonatal enteritis

The pathogens identified in neonatal bovine faecal samples during the quarter are shown in Table 1.

Other enteric conditions

Parasitic ova found in ruminant faeces samples submitted during the period are shown in Table 2, page 3.



Figure 1: Fungal reticulitis in a heifer

Johne's disease

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 335 bovine faecal samples. Twelve samples (3.6 per cent) contained acid-fast organisms typical of MAP. Of 3075 bovine blood samples that were tested for antibodies to MAP 249 (8.1 per cent) were positive.

Reproductive and mammary diseases

Abortion

Specimens from 104 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 49 cases (47.1 per cent).

Of these, *Escherichia coli* (11 cases, 10.6 per cent) was the most commonly identified pathogen.

Other pathogens identified included: *A. pyogenes* (8 cases, 7.7 per cent), *Bacillus licheniformis* (8 cases, 7.7 per cent), BVDV (7 cases, 6.7 per cent), *Neospora caninum* (7 cases, 6.7 per cent) and *Leptospira Hardjo* (2 cases, 1.9 per cent).

Table 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, April to June 2011.

Pathogen	Number	
	Tested	Positive (%)
<i>Cryptosporidium</i> species	133	41 (30.8%)
Rotavirus	391	124 (37.7%)
Coronavirus	397	15 (3.8%)
<i>Escherichia coli</i> K99	180	8 (4.4%)

Table 2: Endoparasitic infections in ruminants in Northern Ireland, April to June 2011.

	No of parasitic ova						% positive
	Total	Negative	+	++	+++	++++	
Liver fluke							
Bovine	648	600	35	11	2	0	7.4%
Ovine	227	221	6	0	0	0	2.6%
Paramphistome							
Bovine	652	472	78	58	27	17	27.6%
Ovine	237	162	47	24	3	1	31.6%
Coccidia							
Bovine	859	672	136	19	10	22	21.8%
Ovine	288	100	127	33	22	6	65.2%
Strongyle worm egg count							
		<500 epg	≥500 epg				
Bovine	831	783	48				5.8%
Ovine	285	267	18				6.3%

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

Mastitis

A total of 781 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases.

69 (8.8 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 125 samples.

E. coli was the most frequently isolated organism and accounted for 24.7 per cent of isolates cultured.

Other frequently identified organisms included: *Streptococcus uberis* (21.4 per cent), *Staphylococcus aureus* (9.5 per cent), other *Streptococcus* species (6.4 per cent), *Pseudomonas* species (6.8 per cent), other *Staphylococcus* species (5.1 per cent), other *Bacillus* species (4.8 per cent), *Enterococcus* species (3.2 per cent), *Streptococcus dysgalactiae* (2.8 per cent) and *Corynebacterium bovis* (2.7 per cent).

Neurological diseases

One case of *Clostridium botulinum* type D toxicosis was diagnosed during the second quarter of 2011.

Listerial encephalitis was diagnosed in a twelve-month-old steer which was euthanased after being unable to rise.

Bovine Neonatal Pancytopenia

Fourteen cases of bovine neonatal pancytopenia were recorded during the quarter. Advice was sent out to practising veterinary surgeons concerning aspects of the condition and its control.

Cardiovascular disease

A ventricular septal defect was diagnosed in a three-week-old Holstein male calf. The calf was in good condition but had presented recumbent twenty four hours before death. At postmortem examination the heart appeared large and flabby, there was a 6 cm diameter hole in the inter-ventricular septum and hydropericardium was present.

Vegetative endocarditis and septic arthritis due to *Streptococcus suis* infection were detected in a thirty-month-old heifer with a history of ill thrift and weight loss. It was noted that *S. suis* infection occurs sporadically in cattle, goats, horses and dogs.

Babesiosis was diagnosed in a one-year-old heifer showing clinical jaundice whilst at grass for the first time. Liver histology showed paracentral to midzonal acute liquifactive hepatic necrosis. Parasitaemia was detected by examination of blood smears and haematological examination demonstrated anaemia. The liver lesions were ascribed to local anoxia resulting from the anaemia.

SMALL RUMINANTS: SHEEP:

Respiratory diseases

Respiratory disease was identified in 23 ovine postmortem submissions during this quarter. *M. haemolytica* (six cases), *P. multocida* (four cases), jaagsiekte (three cases) and laryngeal chondritis (two cases) were the most common diagnoses.

Pneumonia due to *M. haemolytica* infection was diagnosed at necropsy in a three-year-old ewe at grass with lambs at foot. Acute *Mannheimia* mastitis was also present and the distribution of the lung lesions seen on histology suggested embolic spread from the udder in this case.

Alimentary diseases

Necrobacillosis was diagnosed in a two-month-old lamb. Gross examination of the liver showed the presence of military pale yellow foci, *Fusobacterium necrophorum* was recovered from cultures.

Perforation of the rumen by a bite was the cause of death in a shearling ram subject to attack by a dog. At necropsy there was a massive cellulitis and myositis of the left flank associated with perforation and fistulation of the dorsal rumen wall. A profuse growth of *E. coli* was recovered from systemic cultures.

Johne's disease

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

Nutritional and metabolic diseases

Copper poisoning was diagnosed in four lambs aged six to eight weeks. The flock had suffered losses around three hours after oral dosing with a benzimidazole anthelmintic supplemented

with selenium and cobalt and concurrent over-dosing with a mineral supplement containing copper and cobalt. At necropsy there were muscle haemorrhages, pulmonary oedema, thoracic and abdominal effusions and abomasitis. Liver copper levels were at the high end of the normal reference range while kidney copper levels were elevated (15 to 21 ppm wet weight: normal range 4.0 to 5.5 ppm wet weight).

Reproductive diseases

Specimens from 31 ovine abortions and stillbirths were examined during the second quarter. Significant pathogens were detected in 18 cases (58.1 per cent).

Of these, *Chlamydophila abortus* and *Toxoplasma* were the most commonly identified pathogens and were both detected in 9 cases (29 per cent). Other pathogens identified included *Leptospira* (2 cases, 6.5 per cent) and *Campylobacter* (1 case, 3.2%).

Neurological diseases

One case of listeriosis was confirmed by postmortem examination during the second quarter of 2011. There was concurrent parasitic gastro-enteritis with 370 *Trichostrongylus axie*, 33,330 *Trichostrongylus circumcincta* and 740 *Telodosargia* spp present in gut washings.

Botulism in a ewe

C. botulinum type D toxin was diagnosed in a four-year-old ewe at pasture. The history indicated that the farm had lost fifteen of its cattle herd and fifteen of its sheep flock following the spreading of chicken litter on adjacent land. No significant abnormalities were detected at necropsy but botulism toxin detection tests gave positive results on small intestine contents and faeces. Botulism is uncommon in sheep in Northern Ireland. Clostridial enterotoxaemia (pulpy kidney disease) was diagnosed in a one-month-old lamb on the basis of alpha and epsilon toxin isolation and the presence of characteristic lesions in the cerebrum. Bilateral haemorrhages were seen grossly in the basal nuclei with perivascular haemorrhages, micro-thrombi and neuropil rarefaction being detected histologically.

Cardiovascular disease

Aortic dissection was diagnosed in a shearling ewe. There was an aortic tear with dissection and intra-thoracic haemorrhage. The ewe was heavily pregnant.

HORSES:

All 124 swabs that were examined for the presence of *Tayorella equigenitalis* were negative. Four swabs were cultured from horses with a history suggestive of strangles, two of which were positive.

PIGS:

Respiratory disease

Pneumonia and pericarditis due to infection with *Actinobacillus pleuropneumoniae* serotype 2 and *P. multocida* was diagnosed in pigs from a fatterer unit seeing a sudden upsurge in losses. No evidence of intercurrent porcine circovirus infection was found.

Alimentary diseases

Gastric ulceration and haemorrhage without perforation was seen in an adult sow submitted for necropsy. The history indicated a 2.0% loss of sows indoors, affected pigs showed pallor prior to death.

A problem associated with post-weaning diarrhoea and ill thrift was investigated on an intensive fattening unit. *Salmonella* Typhimurium was recovered in septicaemic distribution from pigs of between 47 and 54 days of age. Cryostat sections of mesenteric lymph node were weakly positive for porcine circovirus-2 (PCV-2) antigen. Histological examination of the spleen and mesenteric lymph nodes showed lesions consistent with PCV-2 infection. Advice was given to vaccinate against PCV-2.

Neurological diseases

Fibrinous and lymphohistiocytic meningitis due to *S. suis* infection was diagnosed in growing pigs of between 47 and 67 days of age.

Lymphoma

Multi-centric leukaemic lymphoma was diagnosed in a 15-week-old male pig. At necropsy there were bilateral multifocal, raised, dark red, well circumscribed, nodules in the renal cortex (Figure 2). The liver was enlarged and showed a lobular pattern. Diffusely



Figure 2: Renal lesions of multi-centric leukaemic lymphoma in a growing pig.

enlarged mesenteric lymph nodes and hepatic lymph nodes with dark red parenchyma were present. There was pulmonary congestion and enlargement of the mediastinal and bronchial lymph nodes. *Salmonella* Typhimurium was recovered in profuse growth from systemic cultures.

BIRDS: Cage and aviary

Pigeon circovirus infection was diagnosed in a group of young pigeons which were fading away and dying at around ten to twelve weeks of age. Fourteen out of 80 birds in the loft had died at the time of submission. On histological examination lesions consistent with degenerative circoviral bursitis including intracytoplasmic inclusion bodies in the histiocytes were present.

WILDLIFE and EXOTICS

Fungal air sacculitis due to *A. fumigatus* infection was diagnosed in an adult Gentoo penguin (*Pygoscelis papua*) from a zoological collection. The bird had presented with respiratory distress of four days' duration.

Starvation and hypothermia due to maternal separation was diagnosed in a neonatal harbour porpoise (*Phocoena phocoena*). Over-inflation of the lungs and the presence of rib imprints on the caudal surfaces suggested that live-stranding had occurred. It was noted that harbour porpoises calve during the spring and summer months off the coast of Ireland and that starvation and hypothermia are common causes of deaths in neonates at this time of year.

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.