

Northern Ireland Disease Surveillance Report,
1st July to 30th September 2010

- Parasitic pneumonia in a four-year-old bull
- Congenital defects in calves
- Tapeworm infestation in sheep
- Chronic fasciolosis and *Salmonella* Agama infection in sheep
- Circovirus infection in pigeons
- Cholelithiasis in a spectacled bear

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1st July to 30th September 2010

CATTLE:

Respiratory diseases

Respiratory disease was identified in 86 cattle postmortem submissions between July and September 2010. The most common diseases or pathogens identified included parasitic bronchopneumonia or husk (sixteen cases), *Mannheimia haemolytica* (eleven cases), *Pasteurella multocida* (ten cases), *Arcanobacterium pyogenes* (four cases), *Histophilus somni* (two cases), infectious bovine rhinotracheitis virus (IBRV) (two cases) and *Mycoplasma bovis* (one case).

Parasitic pneumonia was diagnosed on postmortem examination of a four-year-old bull showing a painful dyspnoea and pyrexia with groaning whilst recumbent. There was no response to antibiotics but clinical improvement was noted on treatment with corticosteroids.

At necropsy a heavy lungworm (*Dictyocaulus viviparus*) infection was detected and there was an interstitial pneumonia (Figure 1). The history indicated that the bull had broken out into neighbouring cattle around one to two weeks prior to showing clinical signs.



Figure 1. Lungworm in a four-year-old bull.

Alimentary diseases

BVD / Mucosal disease

Of 2213 blood samples that were tested for bovine viral diarrhoea virus (BVDV) by virus isolation or antigen capture ELISA, 143 (11.30 per cent) were positive.

In addition, 12 of 349 (3.44 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. In 17 instances PCR testing of pooled blood samples was used to detect virus positive animals within a group. Subsequent individual sampling detected the presence of at least one antigen positive (antibody negative) animal in each group. BVDV was detected in 14 of 120 (11.66 per cent) bulk milk samples tested by real time RT-PCR.

Paralytic ileus in a heifer

A two-month-old heifer was submitted with a history of pneumonia and diarrhoea. At necropsy there was a striking accumulation of clear fluid in the abdomen and thorax. The rumen was under-developed and there was distension of the proximal jejunum with homogenous pasty-to-solid material, while the

Pathogen	Number	
	Tested	Positive (%)
<i>Cryptosporidium</i> species	190	55 (28.95%)
Rotavirus	147	32 (21.77%)
Coronavirus	148	5 (3.38%)
<i>Escherichia coli</i> K99	56	0 (0%)

Table 1. Pathogens identified in neonatal bovine faecal samples in Northern Ireland July to September 2010.

distal jejunum, caecum and colon were empty and collapsed. A diagnosis of intestinal stasis or ileus was made. It was considered likely that the ascites was the result of hypoproteinaemia resulting from digestive abnormality.

Neonatal enteritis

The pathogens identified in neonatal bovine faecal samples during the quarter are shown in Table 1. (page 2) Overall, *Cryptosporidium* species and Rotavirus were the most common pathogens identified.

Johne's disease

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 277 bovine faecal samples. Ten samples (3.6 per cent) contained acid-fast organisms typical of MAP.

Of 2286 bovine blood samples that were tested for antibodies to MAP 215 (9.41 per cent) were positive.

Other enteric conditions

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

Nutritional and metabolic disease

Poisoning due to lead was diagnosed in a three-month-old calf. The history indicated possible exposure through recent disturbance of an old lead mine within the grazing. At necropsy the meninges were suffusedly bright red in colour, there were petechial haemorrhages in the thymus and a purulent focus in one umbilical artery remnant. Histologically there were lymphohistiocytic cuffs present in the brainstem.

Table 2: Endoparasitic infections in ruminants in Northern Ireland, July to September 2010

	No of parasitic ova						% positive
	Total	Negative	+	++	+++	++++	
Liver fluke							
Bovine	969	876	75	16	2	0	19.6%
Ovine	1132	1007	87	24	9	5	11.0%
Paramphistome							
Bovine	818	551	137	95	25	10	32.6%
Ovine	966	682	145	102	27	10	29.4%
Coccidia							
Bovine	1196	899	238	28	10	21	24.8%
Ovine	1440	1002	348	51	17	22	30.4%
Strongyle worm egg count							
		<500 epg	≥500 epg				
Bovine	1129	966	163				14.4%
Ovine	1355	1118	237				17.5%

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

Kidney lead levels were 99.2µg per g (normal range: <25µg per g). A second calf submitted after treatment with Calcium EDTA had a kidney lead level of 20.8µg per g.

Reproductive and mammary diseases

Abortion

Specimens from 115 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 55 cases (47.8 per cent).

Of these, *Salmonella* Dublin (15 cases, 13 per cent) was the most commonly identified pathogen. Other pathogens identified included, *Escherichia coli* (13 cases, 11.3 per cent), *Leptospira Hardjo* (10 cases, 8.7 per cent), *Neospora caninum* (8 cases, 7 per cent), BVDV (7 cases 6.1 per cent), *A. pyogenes* (2 cases, 1.7 per cent) and *Bacillus licheniformis* (2 cases, 1.7 per cent).

Mastitis

A total of 1344 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases.

In 142 (10.6 per cent) samples, cultures yielded more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 110 samples. *E. coli* was the most frequently isolated organism and accounted for 21.6 per cent of isolates cultured.

Other frequently identified organisms included: *Streptococcus uberis* (16.2 per cent), *Staphylococcus aureus* (11.4 per cent), other *Staphylococcus* species (10.7 per cent), other *Streptococcus* species (8.9 per cent), *Bacillus* species (4.2 per cent), *Enterobacter* species (3.9 per cent), *Pseudomonas* species (3.5 per cent), *Enterococcus* species (2.9 per cent), *Streptococcus dysgalactiae* (2.4 per cent) and *Aeromonas* species (1.9 per cent).

Neurological diseases

Botulism in cattle

Clostridium botulinum type D toxin was detected in seven cases during the 3rd quarter of 2010.

In one case, in which two 27-month-old bullocks died, the history indicated that dead crows had been found in a water trough in the field.

Other neurological diseases

A 15-month-old heifer was euthanased and submitted with a history of dullness and recumbency lasting several days. At necropsy there was an excess of cloudy fluid in the meningeal space and an abscess containing approximately 10 ml of thick green pus was observed in the pituitary fossa. A large fibrin clot was present on the ventral surface of the brain. Suppurative meningitis was seen on histological examination. *E. coli* and *A. pyogenes* were recovered from the abscess. It was noted that the pituitary fossa is a predilection site for abscess formation caused by bacteria of haematogenous origin.

A three-week-old calf was submitted from a herd with a history of seven calves with similar neurological signs having being born already over a period of less than ten weeks. At gross necropsy there was a profound cerebellar hypoplasia.

Histology confirmed the hypoplasia and showed a sparse residual inflammatory infiltrate to be present. Immuno-stained brain sections were negative for the presence of bovine virus diarrhoea antigen.

Calves persistently infected with BVDV had been diagnosed previously in the herd and a vaccination programme advised. This was only partially complete at the time of the submission. Advice was given on completing the vaccination of the herd as soon as possible and on appropriate screening for possible future persistently infected calves.

Other Diseases

Salmonellosis in dairy cattle

S. Dublin infection was diagnosed as being the cause of problems in a dairy herd. Malaise and death were seen in milking cows and several abortions occurred. Necropsy and histology findings were consistent with salmonellosis. *S. Dublin* was isolated from the viscera of adult

cows submitted for postmortem examination and from abortion material. Appropriate advice on control and vaccination was given.

Bovine neonatal pancytopenia

Twelve cases of bovine neonatal pancytopenia were diagnosed during the reporting period. In some cases there were significant secondary infections. *Mannheimia varagena* and *E. coli* were recovered from affected, septicemic calves.

Urinary tract diseases

Two interesting cases involving the urinary tract were seen during the reporting period. Bilateral polycystic kidneys were found at necropsy of a four-month-old calf showing anorexia and dullness. The lesions were considered to be congenital and to represent a developmental defect. Ulcerative cystitis leading to rupture of the bladder was diagnosed in a 30-month-old bull submitted with a history of malaise and pain. Necropsy revealed the bladder rupture with associated fibrinous peritonitis; there was no evidence of urolithiasis.

Sporadic lymphoma in cattle

Two cases of sporadic bovine lymphoma were reported during the period, one was the adult form of the disease in a two-year-old heifer with multicentric lesions within the abdominal cavity. Numerous large pale nodules were found attached to the omentum, the serosal surface of the abomasum, the serosal surfaces of other abdominal viscera and the peritoneum. Multiple pale soft nodules almost replaced the kidney tissue and surrounded the aorta and renal vessels. A few small neoplastic foci were attached to the parietal pleura and to the epicardium. Histological examination confirmed the neoplastic tissue to be a lymphoma comprised of a uniform population of small round lymphoid cells with a low mitotic index.

The other case was an instance of the thymic form of the disease in a 14-week-old calf which presented with a history of swelling behind the left angle of the jaw.

At necropsy, a large rather irregular swelling was found extending caudally along the left

and ventral aspects of the neck. On incision, this was seen to comprise large, contiguous, nodular masses of pale-coloured tissue with occasional haemorrhagic foci. The mass was displacing the trachea and oesophagus and there was a retro-pharyngeal abscess within the neoplastic tissue close to the larynx. Histology confirmed the presence of a lymphoma comprised of well-differentiated uniform small to medium sized lymphoid cells in a light fibrous matrix. *S. Dublin* was recovered from selenite enrichment cultures of the small intestine.

Ventricular septal defect in cattle

A three-week-old calf was submitted with a history of sudden death. At necropsy the carcass was pale and moist with an excess of clear fluid in the body cavities. The heart was enlarged and rounded and on incision, a large defect was found in the inter-ventricular septum. The liver showed marked centrilobular necrosis associated with circulatory failure.

SMALL RUMINANTS: SHEEP

Respiratory diseases

Respiratory disease was identified in 12 ovine postmortem submissions during this quarter. *Mannheimia haemolytica* (four cases), bronchopneumonia (four cases), laryngeal chondritis (two cases), *Pasteurella multocida* (one case) and Jaagsiekte (one case) were the most common diagnoses.

Alimentary disease

A three-month-old lamb submitted for necropsy in July was found to have intestinal obstruction caused by two *Monezia expansa* tapeworms, each several metres in length. It was noted that intestinal obstruction is a well documented complication of tapeworm infection in sheep.

A three-month-old lamb died suddenly and samples of lung and liver were submitted for histology. Sections of the liver showed marked portal congestion with severe haemorrhagic parasite tracking present throughout the parenchyma. There were occasional profiles of *Cysticercus tenuicollis* in the damaged tissue (Figure 2).

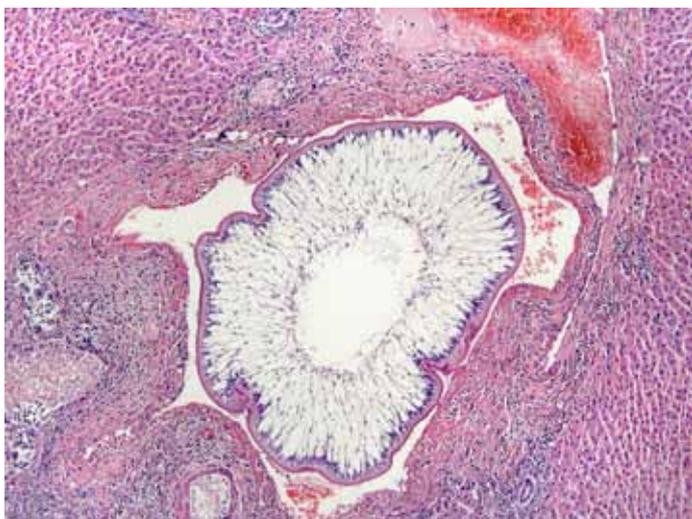


Figure 2. *Cysticercus tenuicollis* in the liver of a three-month-old lamb.

The lesions were considered to be consistent with invasion by migrating cysticerci of the cestode *Taenia hydatigena* (also known as *Cysticercus tenuicollis*).

Fasciolosis

Two cases of chronic fasciolosis in adult sheep were considered to be worthy of further investigation because the treatment history of both flocks suggested that resistance to triclabendazole was a possibility in each case. These investigations are ongoing.

In one case deaths in ewes were associated with *Fasciola hepatica* and concurrent infection with *Salmonella* Agama. This organism has previously been associated with clinical disease in sheep. Wildlife and environmental contamination including duck ponds are important reservoirs of infection.

Johne's disease

Six ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. No samples contained acid-fast organisms typical of MAP. Eleven ovine blood samples were tested for antibodies to MAP, one of which was positive.

Reproductive diseases

Abortion

The causes of ovine abortions in the 2010 lambing season are shown in Figure 3.

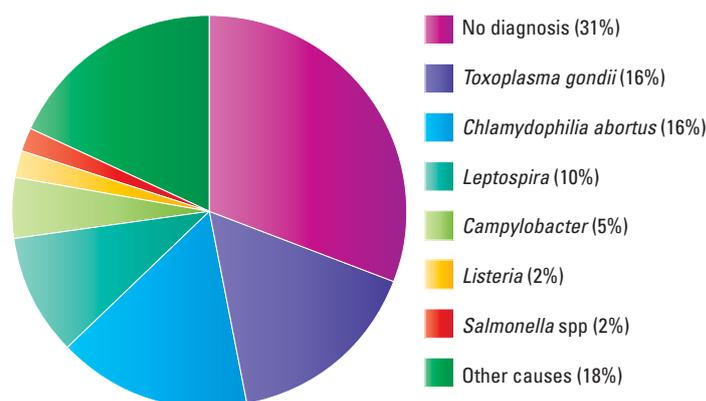


Figure 3. Causes of ovine abortion in 2010.

The most common causes of abortion were: *Chlamydophila abortus* (16.3%), *Toxoplasma gondii* (15.6%), *Leptospira* Hardjo (9.6%) and *Campylobacter* (5.3%).

No significant pathogens were detected in 31.2% of cases.

Neurological diseases

One case of listeriosis was confirmed by postmortem examination during the 3rd quarter of 2010.

Skin diseases

No cases of sheep scab were confirmed during the 3rd quarter of 2010.

Other diseases

Valvular endocarditis was diagnosed on postmortem examination and histology in a six-month-old lamb submitted for necropsy following sudden death. No bacteria could be recovered from the lesions. This lamb also had a significant level of gastrointestinal nematode infection (6800 epg: strongyle spp).

HORSES:

Twelve swabs were cultured from horses with a history suggestive of strangles, two of which were positive.

Significant *Strongyloides* worm burdens were detected in two cases. 15,300 *Strongyloides* species were detected in the small intestine of an eight week-old donkey foal. 111,600 *Strongyloides* eggs per gram were detected in

the caecal contents of a foal that died 48 hours after the onset of diarrhoea. Mild hepatitis was also detected histologically.

Large numbers of cyathostomes and tapeworms were found in the intestines of a mare that was submitted for postmortem examination after having reportedly being found in a ditch over 48 hours previously. The carcass was very autolysed. There were also several lacerations on the left carpus.

There was a 20 cm tear in the stomach wall of a six-year-old male horse that was euthanased due to severe colic. The stomach was dilated and filled with dry ingesta and there was secondary peritonitis. Torsion of the large intestine was diagnosed on postmortem examination of a seven-year-old stallion which had presented with colic.

PIGS:

Respiratory diseases

Intercurrent infection with pandemic H1N1/09 influenza A virus was diagnosed in pigs on a unit with a post weaning diarrhoea and ill thrift problem. At necropsy there was enlargement of the carcass lymph nodes and the colon contents of two of the pigs examined were yellow-grey in colour and watery in consistency. Although no gross abnormalities were found in the lungs, swine influenza antigens were detected by immunofluorescence in the lung tissue of two pigs and this finding was confirmed by PCR in one animal. The virus had already been detected in this herd in September 2009, the first such diagnosis in Northern Ireland. It was noted that infection with influenza virus had persisted in the unit. This is very likely to be the underlying cause of the post weaning diarrhoea and ill thrift problems due to the immunosuppressive effects of the virus allowing the establishment of *E. coli* and other infections.

BIRDS: Poultry

Salmonella Typhimurium infection was diagnosed in a group of 28 three-week-old ducklings. Although gross necropsy findings were non-specific, *S. Typhimurium* was isolated

in septicaemic distribution confirming the diagnosis.

BIRDS: Cage and aviary

Pigeon Circovirus infection was diagnosed in a group of pigeons also infected with pigeon paramyxovirus-1 (PPMV-1). It was speculated that the immuno-suppressive effects of the Circovirus infection had reduced the response to the PPMV-1 vaccine which had been used in the birds.

Hepatic haemochromatosis was diagnosed in a crested screamer. Histological examination of the liver showed the hepatocytes to be filled with a golden brown pigment. The presence of iron was confirmed using Perl's Prussian blue histological stain.

WILDLIFE AND EXOTICS:

Cholelithiasis and consequent hepatic cirrhosis was diagnosed in a 23-year-old spectacled bear (*Tremarctos ornatus*) from a zoological collection.

At necropsy the carcass was thin and jaundiced. The abdomen was distended with amber-coloured slightly viscous fluid and fibrin clots. The liver was small, very firm with multiple nodules and very little normal architecture remaining. The gall bladder was distended with a grey, opaque and viscous fluid and contained ten large gall stones. Histology showed severe and generalised hepatic fibrosis with regenerative nodules of hepatocytes present. The diagnosis was advanced hepatic cirrhosis probably secondary to long-standing cholelithiasis. Death was due to liver failure with associated jaundice and ascites.

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.