

Northern Ireland Disease Surveillance Report, 1 July 2011 to 30 September 2011

- Pulmonary adenocarcinoma in a dairy cow
- Parasitic pneumonia in adult cattle and calves
- *Salmonella* Dublin infection in calves
- Caseous lymphadenitis in a ram
- Hepatic necrosis in a blue crowned laughing thrush

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1 July to 30 September 2011.

CATTLE:

Respiratory diseases

Respiratory disease was identified in 53 cattle postmortem submissions between July and September 2011. The most common pathogens identified included:

Arcanobacterium pyogenes (eleven cases), parasitic bronchitis (ten cases), *Pasteurella multocida* (six cases), *Mannheimia haemolytica* (five cases), *Mycoplasma bovis* (four cases) and *Histophilus somni* (four cases).

Pulmonary adenocarcinoma

An adult Friesian cow was submitted for slaughter; at routine meat inspection a number of firm, orange or yellow coloured nodular lesions were seen to be spread through the lung parenchyma. Histology showed the presence of a papillary adenocarcinoma with an extensive connective tissue stroma (Figure 1). Serology for enzootic bovine leucosis (EBL) was negative. Primary lung tumours of cattle are rare and do not appear to cause clinical signs or economic

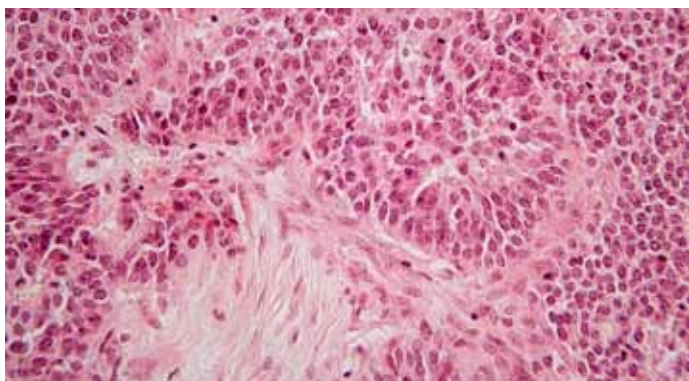


Figure 1: Pulmonary adenocarcinoma in a cow, showing the arboreal pattern of growth and acinar elements: Haematoxylin and Eosin stain X 400

loss - they are often incidental findings at slaughterhouses. Their importance lies in the need to distinguish them from the lesions of important animal and food chain safety diseases.

Laryngeal obstruction

Laryngeal obstruction was diagnosed at necropsy in a four-year-old cow submitted with a history of sudden collapse. A bolus of cud obstructing the laryngeal lumen was detected associated with petechial haemorrhages along the tracheal mucosa and mucosal haemorrhages underlying the obstruction. Vitreous humour magnesium and calcium levels were unremarkable and no pathology of the nervous system was detected.

Pneumonia

Two instances of pneumonia involving *H. somni* infection were diagnosed at necropsy during August. The first was in a group of three-month-old calves showing fibrino-necrotic lobar pneumonia. In the second case bacterial pneumonia was secondary to *Dictyocaulus viviparus* infection in a group of adult cows at grass.

Bovine lungworm infection

Two further cases of bovine lungworm infection were diagnosed in both a calf and an adult cow during September. In the latter case histological examination of the lung showed lesions consistent with postpatent *D. viviparus* infection and no lungworm larvae were detected in the faeces. There was an associated recent renal infarct, which was considered to be the result of embolism from the damaged lung tissue.

Thrombo-embolic pneumonia

A ten-year-old dairy cow was submitted in September with a history of progressive reduction in milk yield. Clinical examination had shown a jugular pulse and a positive reaction to the withers test. At necropsy two large abscesses were present on the medial aspect of the first and second ribs at the level of the costochondral junction. There were associated multiple necrotic foci in an embolic pattern throughout all lung lobes. Extensive focal myocardial and hepatic necrosis was also present. *A. pyogenes* was recovered from the abscesses, lungs and liver consistent with pyaemia originating from the site of the abscessation. Advice was given to the herd

owner on the hygienic storage of syringes and needles and aseptic injection technique.

Alimentary diseases

BVD / Mucosal disease

Of 3359 blood samples that were tested for bovine viral diarrhoea virus (BVDV) by virus isolation or antigen capture ELISA 241, (7.2 per cent) were positive. In addition, 20 of 234 (8.5 per cent) submitted tissues and nasal mucus samples were positive by immunofluorescence. Ten cases of mucosal disease were confirmed at postmortem examination during this period.

Jejunal rupture was diagnosed in a two- day-old calf which died suddenly. ESBL positive *Escherichia coli* was recovered from cultures of the intestinal contents. The history given made no mention of antibiotic therapy having being undertaken.

Liver disease

A six-year-old cow was submitted for examination following sudden death. The history indicated that

two cows out of a group of 29 had died suddenly. At necropsy there were multiple foci of necrosis throughout the liver. Histological examination of the lesions showed the presence of gram negative bacilli, often with a filamentous growth pattern present in the cellular debris at the periphery of the necrosis. Based on lesion and bacterial morphology *Fusobacterium* spp infection was suspected. No evidence of active alimentary tract disease or foot lesions was detected.

A six-year-old cow was submitted with a history of sudden death two days after calving and following treatment for milk fever by the farmer. On necropsy the liver appeared swollen, pale and greasy. Hepatic lipidosis was confirmed histologically.

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, July to September 2011.

Pathogen	Number	
	Tested	Positive (%)
<i>Cryptosporidium</i> species	43	11 (25.6%)
Rotavirus	163	54 (33.1%)
Coronavirus	159	9 (5.7%)
<i>Escherichia coli</i> K99	56	6 (10.7%)

Table 2: Endoparasitic infections in ruminants in Northern Ireland, July to September 2011.

	No of parasitic ova						% positive
	Total	Negative	+	++	+++	++++	
Liver fluke							
Bovine	860	800	49	11	0	0	7%
Ovine	129	118	10	1	0	0	8.5%
Paramphistome							
Bovine	866	603	130	94	28	11	30.4%
Ovine	129	110	15	4	0	0	14.7%
Coccidia							
Bovine	998	777	157	32	19	13	22.1%
Ovine	215	67	109	19	17	3	68.8%
Strongyle worm egg count							
		<500 epg	≥500 epg				
Bovine	985	910	75				7.6%
Ovine	214	158	56				26.2%

≥ 500 eggs per gram of faeces (epg) was considered of likely clinical significance

+ Low, ++ Moderate, +++ High, ++++ Very high

Other enteric conditions

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

Johne's disease

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 273 bovine faecal samples. 22 samples (8.1 per cent) contained acid-fast organisms typical of MAP. Of 1853 bovine blood samples that were tested for antibodies to MAP 179 (9.7 per cent) were positive.

Reproduction and mammary diseases

Abortion

Specimens from 114 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 51 cases (44.7 per cent).

Of these, *Salmonella* Dublin (13 cases, 11.4%) was the most commonly identified pathogen.

Other pathogens identified included:

A. pyogenes (7 cases, 6.1 per cent),
Leptospira Hardjo (7 cases, 6.1 per cent),
Neospora caninum (6 cases, 5.3 per cent),
Streptococcus species (6 cases, 5.3 per cent),
E. coli (5 cases, 4.4 per cent),
 BVDV (4 cases, 3.5 per cent) and
Bacillus licheniformis (3 cases, 2.6 per cent).

Congenital hepatic fibrosis was detected in an eight-month-old foetus. Histological examination of the liver showed the peri-portal areas to be expanded by fibrosis. There was associated bile duct reduplication and an infiltrate of lymphocytes and macrophages was present. The cause of congenital hepatic fibrosis is not known but it is potentially the result of circulatory disturbance or hypertension. The condition is likely to be a sporadic cause of abortion.

Dystocia

A thirty-month-old heifer died two days post calving. At necropsy a 25 cm vaginal laceration with associated haemorrhage was detected (Figure 2). This was considered to be the cause of death. Unfortunately the history which could be obtained was vague and it was not clear if assistance had been provided at calving.

Mastitis

A total of 1370 bacterial isolates were cultured from milk samples submitted from acute and chronic



Figure 2: Vaginal laceration in a heifer.

mastitis cases. 138 (10.1 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 257 samples.

Streptococcus uberis was the most frequently isolated organism and accounted for 19.5 per cent of isolates cultured.

Other frequently identified organisms included:

E. coli (18.5 per cent),
Staphylococcus aureus (12.8 per cent),
 Other *Staphylococcus* species (13.7%),
Streptococcus species (6.8 per cent),
Pseudomonas species (4.3 per cent),
Bacillus licheniformis (4.2 per cent),
Corynebacterium bovis (3.9 per cent) and
Streptococcus dysgalactiae (3.1 per cent).

Neurological disease

Clostridium botulinum type D toxin was diagnosed in three cases during the 3rd quarter of 2011.

Musculoskeletal disease

Blackleg was diagnosed in a three-month-old bullock which presented following sudden death. At necropsy there were focal, hard dark red coloured friable lesions present in the gluteal muscle mass on the left side and in the intercostal muscles on the right side. There was blood tinged gelatinous oedema of the fascial planes. In this case, the first injection of the primary course of vaccination had been given. Advice was given to complete the vaccination course.

Osteomyelitis due to *Salmonella* Dublin infection

Two cases of osteomyelitis due to *S. Dublin* infection were diagnosed during the recording period. Each was in a three-month-old calf which had failed to show response to treatment for lameness or recumbency.

In the first case, osteomyelitis of the final cervical vertebra with necrosis and pathological fracture of the vertebral body had occurred (Figure 3).



Figure 3: Osteomyelitis, vertebral fracture and spinal cord compression in a calf.

Displacement of the fracture had partly occluded the spinal canal and compressed the spinal cord. In the second case, yellow necrotic lesions were seen in the medulla of the first and second phalanges of both hind limbs with fibrino-necrotic strands in the inter-phalangeal and coffin joints of both hind limbs. In both cases, *S. Dublin* was recovered from swabs taken from the necrotic lesions.

Skin disease

A skin scrape from a three-month-old calf was submitted for bacterial culture. The history indicated that the calf was dull and listless with dermatitis and hair loss. *Staphylococcus hyicus* was recovered from the skin scrape.

Urinary tract disease

Cases of both renal infarction and pyelonephritis were diagnosed during the reporting period. A five-year-old dairy cow with a large injection site abscess in the right gluteal mass was found to have multiple renal infarctions at necropsy. *A. pyogenes* was recovered from swabs taken from the abscess. Advice was given on the importance of sterile injection technique.

A twenty-month-old heifer was submitted with a history of sudden death whilst at grass. On necropsy the carcass was found to be congested. The left kidney was much enlarged (30 cm x 30 cm), fibrosed, cystic and with fibrous adhesions to the surrounding peritoneum. The normal kidney architecture was unrecognisable and the cysts were full of foul smelling liquid pus. *A. pyogenes* was recovered from cultures and pyelonephritis due to ascending infection was diagnosed.

Uro-abdomen, necro-suppurative nephritis, necro-ulcerative cystitis and partial bladder rupture were diagnosed in a three-month-old calf submitted with a history of colic.

Other diseases

Bovine Neonatal Pancytopenia

Five cases of bovine neonatal pancytopenia (BNP) were recorded during the quarter.

Cardiovascular disease

Vegetative endocarditis of the tricuspid valve was diagnosed in a seventeen-month-old Simmental heifer which had been slowly deteriorating for two months and had intermittent appetite and elevated heart rate. *A. pyogenes* was recovered in pure culture from the affected valve. No septic focus was detected elsewhere in the carcass.

Lymphosarcoma

Leukaemic lymphoblastic lymphoma was diagnosed in an eighteen-month-old bullock which also had traumatic reticulitis or hardware injury ('wire'). At necropsy a large (26 x 28 x 13 cm), firm, white mass with multifocal, ecchymotic haemorrhages was adherent to the reticulum wall and diaphragm.

There was enlargement of the hepatic lymph node and focally extensive hepatic parenchymal invasion by a well demarcated, solid, white mass. Multifocal, variably sized, pale areas were present in the liver parenchyma. There was enlargement of the mediastinal and other lymph nodes. Serology for EBL was negative.

SMALL RUMINANTS: SHEEP

Respiratory diseases

Respiratory disease was identified in 13 ovine post mortem submissions during this quarter, including *Mannheimia haemolytica* infection (three cases), pulmonary oedema (two cases), *Pasteurella* infection (one case) and Jaagsiekte (one case).

Alimentary diseases

In mid-August, acute fasciolosis was diagnosed in a fifteen-month-old ewe. It was noted that this was likely to be due to the over-wintering of infected snail populations.

Johne's disease

Twenty-three ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. Four samples (17.4 per cent) contained acid-fast organisms typical of MAP. Eleven ovine blood samples were tested for antibodies to MAP, 1 (9.1 per cent) of which was positive.

Reproductive and mammary diseases

No specimens from stillbirths and abortions were examined during the 3rd quarter.

Neurological disease

No cases of listeriosis were confirmed by postmortem examination during the 3rd quarter of 2011.

Otitis externa, *otitis media* and meningitis were diagnosed in a five-month-old lamb, one of eight amongst a group of 500 which had died over a short period of time. Mixed bacteria were recovered from cultures, suggesting that the infection had spread from the external ear canal. Ear mites (possibly *Psoroptes cuniculi*) were suggested as a possible predisposing cause as it was unlikely that such a young lamb would have been dipped. It was not clear if this particular case was representative of the problem as a whole.

Louping ill

Louping ill was suggested in an eighteen-month-old ewe on the basis of an unremarkable gross examination and severe lymphoid meningitis on histological examination. Virus detection and serology were not attempted.

Skin diseases

No cases of sheep scab were confirmed during the 3rd quarter of 2011.

Other diseases

Caseous lymphadenitis was diagnosed in a one-year-old ram which had died after a short period of non-specific illness. At necropsy there were multiple, large, green, purulent foci in the right prescapular lymph node, the left retropharyngeal lymph node and the left parotid lymph node. *Corynebacterium pseudotuberculosis* was recovered from the abscessed lymph nodes.

HORSES:

No Four swabs were cultured from horses with a history suggestive of strangles, none of which were positive.

A four-week-old foal was submitted with a history of malaise and joint swelling. Parasitism was the most significant finding with a total worm count of 240,000 *Strongyloides westeri* nematodes in the small intestine. The joint effusions were aseptic.

PIGS:

Reproductive and mammary diseases

Abortion

Leptospirosis was diagnosed in a sow litter on the basis of positive *L. bratislava* serology and the detection of antigen in foetal kidney.

Other diseases

Postweaning multisystemic wasting syndrome (PMWS) was diagnosed in three-week old piglets from a herd experiencing increased losses in young pigs. The history indicated that new gilts had been brought into the herd six weeks before the problem began. At necropsy there was extensive fibrinous polyserositis, pneumonia and enteritis. *Streptococcus suis* was cultured from the lung. PCV-2 antigen was detected in lymph nodes and the spleen by immuno-histochemistry and histological examination showed lympho-depletion and amphophilic granular inclusion bodies in the gut-associated lymphoid tissue.

BIRDS:

Hens

Coccidiosis with heavy burdens of coccidia being detected throughout the intestines was diagnosed in an emaciated and anaemic adult laying hen. The infection was likely to have been mixed but *Eimeria tenella* was thought to be responsible for the severe caecal lesions seen. The history indicated that this was a small back yard flock experiencing heavy losses.

BIRDS:

Blue-crowned laughingthrush

Necrotising hepatitis due to *Hafnia alvei* infection was diagnosed in a fledgling blue crowned laughingthrush submitted from a zoological collection. It was noted that *H. alvei* is a cause of necrotising hepatitis, splenitis and septicaemia in laying hens.

Eider duck

Avian tuberculosis and amyloidosis was diagnosed in an adult male eider duck. In this case the extent of the pancreatic amyloidosis detected had caused the loss of a large proportion of the pancreatic islets.

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.