

Northern Ireland Disease Surveillance Report, 1st April to 30th June 2012.

- Lesions suggestive of bovine TB in the udder of a reactor cow
- Fungal pneumonia in five-year-old cow
- Oral vascular hamartoma was detected in a 16-day-old calf
- Lungworm in two three-year-old ewes
- *Listeria monocytogenes* encephalitis in one-week-old chickens

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1st April to 30th June 2012.

CATTLE:

Respiratory diseases

Respiratory disease was identified in 77 cattle postmortem submissions between April and June 2012. The most common pathogens identified included, *Trueperella* (formerly *Arcanobacterium*) *pyogenes* (ten cases), *Mannheimia haemolytica* (ten cases), *Mycoplasma bovis* (seven cases), *Pasteurella multocida* (seven cases), *Histophilus somni* (four cases) and infectious bovine rhinotracheitis (three cases).

Fungal pneumonia

Fungal pneumonia was diagnosed in a five-year-old cow with a history of coughing, nasal discharge, collapse and death. On gross postmortem examination pericarditis, mediastinal emphysema and pulmonary abscessation with emphysematous bullae, were present. Histologically there was severe fibrinonecrotic

pneumonia with haemorrhage and abscess formation. *Aspergillus fumigatus* was cultured from the lung.

Alimentary diseases

BVD / Mucosal disease

Of 3599 blood samples that were tested for bovine viral diarrhoea virus (BVDV) by virus isolation or antigen capture ELISA 300 (8.3 per cent) were positive. In addition, 24 of 402 (6.0 per cent) submitted tissues and nasal mucus samples were positive by immunofluorescence. Nine cases of mucosal disease were confirmed at postmortem examination during this period.

Neonatal enteritis

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

TABLE 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, April to June 2012

Pathogen	Number	
	Tested	Positive (%)
<i>Cryptosporidium</i> species	177	45 (25.4%)
Rotavirus	500	160 (32.0%)
Coronavirus	503	21 (4.2%)
<i>Escherichia coli</i> K99	222	14 (6.3%)

Overall, *Cryptosporidium* species and rotavirus were the most common pathogens identified.

Other enteric conditions

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

TABLE 2: Endoparasitic infections in ruminants in Northern Ireland, April to June 2012

	No of parasitic ova						
	Total	Negative	+	++	+++	++++	% positive
Liver fluke							
Bovine	679	605	58	16	0	0	10.9%
Ovine	182	164	9	5	2	2	9.9%
Paramphistome							
Bovine	679	402	128	125	22	2	40.8%
Ovine	182	133	26	19	3	1	26.9%
Coccidia							
Bovine	889	733	119	16	9	12	17.5%
Ovine	305	116	123	29	22	15	62.1%
Strongyle worm egg count							
		<500 epg	≥500 epg				
Bovine	829	794	35				4.2%
Ovine	256	229	27				10.5%

≥ 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 microscopic examination, with Ziehl-Neelsen staining, on 303 bovine faecal samples. Seven samples (2.3 per cent) contained acid-fast organisms typical of MAP. Of 5623 bovine blood samples that were tested for antibodies to MAP 574 (10.2 per cent) were positive.

Abomasal impaction

Abomasal impaction was diagnosed in a pregnant nine year old cow. On postmortem examination the omasum and abomasum were distended and impacted with solid concretions of ingesta. There were scant, watery contents in the small and large intestines. Abomasal impaction is reported in pregnant cattle and has been linked to the ingestion of low quality roughage (low protein, low energy). The condition may occur in mini outbreaks. Death usually occurs in a few days due to mineral imbalance and dehydration.

Reproductive and mammary diseases

Abortion

Specimens from 118 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 49 cases (41.5 per cent). Of these, *Neospora caninum* (12 cases, 10.2 per cent) was the most commonly identified pathogen. Other pathogens identified included: *Bacillus licheniformis* (10 cases, 8.5 per cent), *Leptospira* Hardjo (8 cases, 6.8 per cent), BVDV (7 cases, 5.9 per cent), *E. coli* (7 cases, 5.9 per cent) and *T. pyogenes* (5 cases, 4.2 per cent).

Mastitis

A total of 408 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. 48 (11.8 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 43 samples. *E. coli* was the most frequently isolated organism and accounted for 24.3 per cent of isolates cultured.

Other frequently identified organisms included:

Streptococcus uberis (16.9 per cent), *Staphylococcus aureus* (8.3 per cent), *Pseudomonas* species (8.3 per cent), *Streptococcus* species (7.4 per cent), *Streptococcus dysgalactiae* (4.4 per cent), non-haemolytic *Staphylococcus* species (3.9 per cent) and *Streptococcus* alpha-haemolytic (3.7 per cent).

Mastitis due to *Mycobacterium bovis*

Lesions suggestive of tuberculosis were detected in the udder (Figure 1) and supramammary lymph node of an eleven-year-old Holstein cow which had been a reactor at a recent tuberculin (TB) test. Numerous acid-fast bacilli were detected in Ziehl-Neelsen stained sections of udder (Figure 2) and supramammary lymph node. Several young calves, which had been multi-suckled on this cow, were also reactors at the TB test.

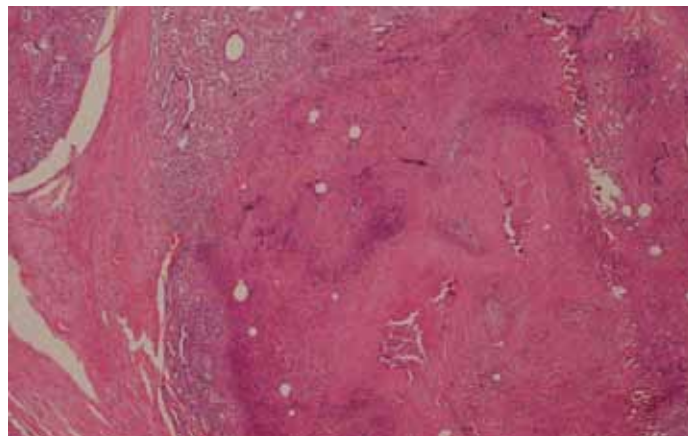


Figure 1. Tuberculosis in a bovine udder. Haematoxylin and eosin. X100

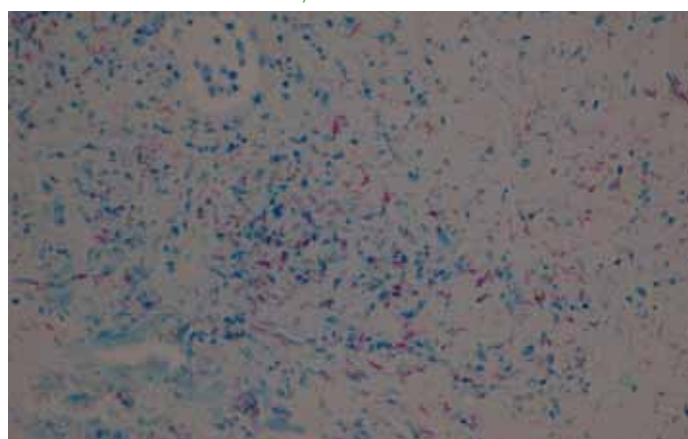


Figure 2. Numerous acid fast bacteria in a tuberculous bovine udder. Ziehl-Neelsen. X400.

Neurological diseases

Clostridium botulinum type D toxin was diagnosed in three cases during the second quarter of 2012.

Clostridium botulinum toxicity was detected in a two-year-old heifer that had been found collapsed in a field with no muscle tone and a prolapsed tongue. The field was in close proximity to poultry housing and previously other animals grazing this field had present with similar signs. On postmortem examination the main finding was autolysis. *Clostridium botulinum* type D toxin was detected in small intestinal contents.

Lead Toxicity

Lead toxicity was diagnosed in two four-month-old heifers that had died suddenly without any history of illness. Two other animals in the batch had also recently died suddenly. Analysis of kidney lead levels from both calves and blood lead levels from one calf revealed elevated lead levels (kidney lead 101.7 µg/g & 47 µg/g upper limit 25 µg/g, blood lead 7.32µM, upper limit 1.4µM). Some painted tin sheeting used as fencing within the field was suspected as the source of the lead.

Other diseases

Bovine neonatal pancytopenia

Four cases of bovine neonatal pancytopenia were diagnosed during the second quarter of 2012. All were characterised by diffuse trilineage hypoplasia of haematopoietic cells, which was evident in the sections of sternal and femoral bone marrow.

Oral Vascular Hamartoma

An oral vascular hamartoma was detected in a 16-day-old calf. On gross postmortem examination the lip, tongue and gingival surfaces had multifocal up to 1cm raised, firm, dark red circular lesions. There was clotted blood in the mouth around the lesions. The oesophagus and rumen contain red/brown fluid (haemorrhage) and ruminal contents were stained red/brown.

Histologically the lesions were characterised as a poorly demarcated vascular tumor within the epithelium, submucosa and superficial muscle. Tumour cells were flat to plump, resembling endothelial cells with a low mitotic rate and were forming large cavernous blood-filled spaces (Figure 3). The lesions were considered consistent with a vascular hamartoma (hemangioma). This is an uncommon tumour that is sometimes encountered as a congenital lesion in calves.

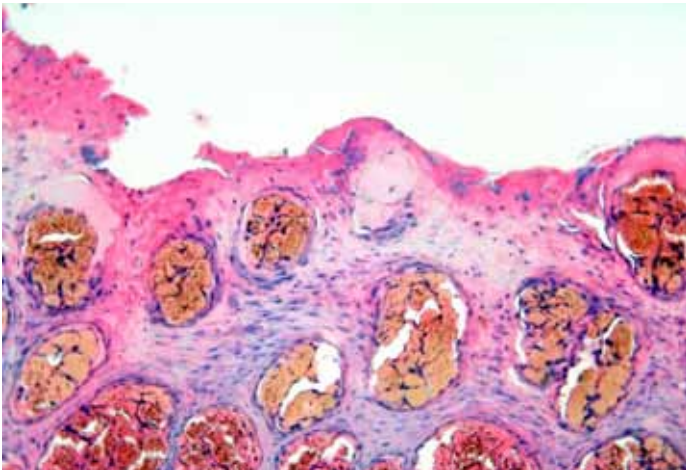


Figure 3. Oral vascular hamartoma in a 16-day-old calf. Haired skin, lip. The hyperplastic epithelium contains numerous cavernous vascular spaces lined by endothelial cells. Haematoxylin and eosin. X100

Fractured Spine

A euthanased six-month-old recumbent bull calf was examined post mortem. The ventral body of the fourth lumbar vertebra was fractured, with upward displacement of a fracture fragment into the spinal canal and focal compression of the lumbar spinal cord. Trauma and nutritional osteodystrophy were considered among the possible aetiologies and a review of the diet and in particular mineral supplementation was recommended. Analysis of bone ash revealed very low calcium levels when expressed as percentage of bone ash (20%; normal 37%).

SHEEP:

Respiratory diseases

Respiratory disease was identified in 30 ovine postmortem submissions during this quarter. *Mannheimia haemolytica* (eight cases), fibrinous pleurisy (six cases), Jaagsiekte (two cases) and parasitic pneumonia (two cases) were the most common diagnoses.

Dictyocaulus pneumonia

Dictyocaulus filaria infection was diagnosed in two three-year-old ewes (Figure 4). Both sheep were heavily pregnant and in poor body condition. Lungworm larvae were detected on the tracheal and bronchial mucosa. Adult lungworm were identified as *Dictyocaulus filaria* and typical lungworm larva were detected in faeces. High strongyle and *Nematodirus* faecal egg counts were also detected in one of the ewes.



Figure 4. Lungworm (*Dictyocaulus filaria*) infection in a three-year-old ewe.

Ovine Pulmonary Adenocarcinoma

Ovine pulmonary adenocarcinoma was detected on histological samples from a three-year-old ram that had died suddenly at shearing. Copious fluid had issued from the nares. On histological examination scattered throughout the lung there are multifocal occasional small areas of type II pneumocyte proliferation lining the alveoli. Although the histological lesions examined were considered mild for this disease, further unexamined extensive lesions may have been present in this case which would have contributed to respiratory arrest and death.

Johne's disease

Four ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. One sample (25 per cent) contained acid-fast organisms typical of MAP. Five ovine blood samples were tested for antibodies to MAP, one (20 per cent) of which was positive.

Reproductive diseases

Specimens from 32 ovine abortions and stillbirths were examined during the 2nd quarter. Significant pathogens were detected in 25 cases (78.1 per cent).

Pathogens identified included:

Toxoplasma (16 cases, 50.0 per cent),
Chlamydophila (7 cases, 21.9%),
Leptospira (2 cases, 6.3 per cent),
E. coli (2 cases, 6.3 per cent) and
T. pyogenes (2 cases, 6.3 per cent).

Neurological diseases

Pituitary Abscess

A pituitary abscess was detected in a six-week-old lamb with a history of sudden death. Histologically the pituitary architecture was effaced by infiltrations of degenerate neutrophils, foamy macrophages and lesser numbers of lymphocytes with hemorrhage, fibrin, edema and myriad colonies of coccoid bacteria. Alpha-haemolytic *Streptococcus* species were isolated from the abscess. The routes usually considered important in the aetiology of this syndrome (cranial trauma, tooth infections, ear infections and nose infections) were all grossly normal in this lamb.

Spinal abscess

A spinal abscess was detected in a one-year-old ewe which had been recumbent for one week. At postmortem examination the joint capsule at the right lateral articulation between the last cervical and first thoracic vertebra was distended by pus and bulged into the spinal canal. The spinal cord at this point was overlaid by a fleshy adhesion which incorporated the right ventral nerve roots. Histologically the spinal cord at the level of the first thoracic vertebra was infiltrated by lymphocytes and plasma cells with occasional foci of neutrophils and mineralisation. Prominent swollen axons and chromatolysis were present in all sectors of the white matter.

HORSES:

One hundred and twenty-nine swabs were examined for the presence of *Tayorella equigenitalis* during this quarter, all of which were negative. Twenty swabs were cultured from a horse with a history suggestive of strangles, all of which were negative.

Myopathy

A five-week old male foal died after a few days of lameness. It had an extensive bilateral degenerative myopathy of the muscles of the thighs, gluteals and caudal lumbar muscles. No cause was found. Vitamin E levels were normal. This foal also had a significant *Strongyloides* worm burden.

BIRDS:

Listeria

Listeria monocytogenes encephalitis was detected in a batch of 43 one-week-old chickens with a history of nervous signs and torticollis. Histologically within the brain there was marked lymphoid and heterophil perivascular cuffing. There was focal encephalomalacia in white matter of cerebellum and brainstem and occasional heterophilic accumulations (microabscesses) in cerebellar white matter some of which contained bacterial colonies. *L. monocytogenes* was isolated in a septicaemic pattern from these birds. The isolation of *L. monocytogenes* in a septicaemic pattern is unusual in chickens, but is consistent with the reported histological findings. Listeriosis in free range chickens has sometimes been associated with wet underfoot conditions, possibly on ground that was flooded.

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.