

Disease Surveillance and Investigation Branch

Northern Ireland Disease Surveillance Report,
1st October to 31st December 2010

- Actinobacillosis in a cow
- Enteritis cystica profunda in a bullock
- Leptospirosis in milking cows
- Forest Flame poisoning in cattle and sheep
- Copper poisoning in sheep
- Ascites in broilers

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1st October to 31st December 2010.

CATTLE:

Respiratory diseases

Respiratory disease was identified in 127 cattle postmortem submissions between October and December 2010.

The most common pathogens identified included:

Mycoplasma bovis (twenty seven cases),
Mannheimia haemolytica (twenty two cases),
Arcanobacterium pyogenes (sixteen cases),
Pasteurella multocida (fourteen cases),
respiratory syncytial virus (BRSV) (five cases),
Histophilus somni (three cases) and
infectious bovine rhinotracheitis virus (IBRV)
(two cases).

Parasitic pneumonia was diagnosed in two five-month-old calves. At necropsy the lungs were found to be over-inflated and emphysematous with patchy consolidation throughout the cranioventral and caudodorsal lobes. Lungworms (*Dictyocaulus viviparus*) were seen in the airways and numerous adult lungworms were found in the trachea.

A six-month-old calf was diagnosed as having died from drowning on the basis of full gross necropsy and histological examination of lung tissue. The left diaphragmatic lung lobes oozed clear fluid on sectioning, persistent white foam was present in the left side airways and there

was petechiation of the mucosa at the tracheal bifurcation. Histological examination showed extensive alveolar emphysema, congestion and haemorrhage. Clumps of vegetation debris and basophilic bacteria were present in the alveolar spaces.

Pleuropneumonia and tracheitis were diagnosed in an eighteen-month-old bullock which had been found dead whilst indoors feeding on silage. Severe focal to confluent necrotising bronchopneumonia with extensive bacterial colonisation was found in the lung tissue. There was also evidence of early abscessation in the lungs. *A. pyogenes* was isolated in pure culture in a septicaemic pattern. Antigens of *Mycoplasma bovis* were also identified by antigen capture ELISA in the lung tissue.

Alimentary diseases

BVD / Mucosal disease

Of 7138 blood samples that were tested for bovine viral diarrhoea virus (BVDV) by either virus isolation or antigen capture ELISA, 2234 (31.3 per cent) were positive.

In addition, 18 of 370 (4.9 per cent) submitted tissues and nasal mucus samples were positive by immunofluorescence.

Seven cases of mucosal disease were confirmed at postmortem examination during this period.

Actinobacillosis in a cow

A three-year-old cow was submitted for necropsy with a history of salivation and failure to thrive. Gross examination showed very marked enlargement of the head lymph nodes with swelling and fibrosis of the tongue. Histologically there was severe, chronic interstitial myositis in a focal to confluent pattern with oedema, congestion, focal myofibrillar necrosis and thrombosis; one club-colony of the *Actinobacillus* type was identified in a blood vessel.

The clinical presentation, gross necropsy appearance and histological findings were considered to be suggestive of actinobacillosis. Bluetongue (BTV) serology and bovine virus diarrhoea (BVDV) antigen capture ELISA results were both negative.

Diseases of the Rumen and Reticulum

Fungal rumenitis associated with ruminal acidosis (pH 4.9) was diagnosed at necropsy of a two-year-old heifer. There was also a severe fibrinous pleurisy and pneumonia, the aetiology of which was not established.

Acute haemorrhage into the abomasum caused the sudden death of a five-year-old Friesian Holstein cow that had calved five months previously. At necropsy the abomasum was full of clotted blood and the small intestine contents were bloody. There was a 15cm diameter para-reticular mass containing fibrous tissue, haemorrhage and blood vessels between the reticulum and abomasum and which had perforated through the abomasal wall (Figure 1).



Figure 1: Abomasal haemorrhage associated with 'hardware injury' in a cow.

A 10cm length of galvanised wire was embedded in the reticular mucosa and the body of the para-reticular mass.

There was an associated extensive peritonitis. It was considered likely that this 'hardware injury' had been present for some considerable time.

Diseases of the small and large Intestine

Enteritis cystica profunda was diagnosed in a sixteen-month-old bullock submitted with a history of long-standing ill thrift. At necropsy the carcass was in poor body condition. Creamy-white nodules were visible beneath the congested serosal surfaces of the small and large intestine. The intestinal mucosa was pale in colour with raised pseudo-diphtheritic plaques.

Histological examination showed extensive inflammatory lesions beneath the muscularis mucosae and the presence of ectopic glandular mucosal elements and cysts filled with mucin (Figure 2).

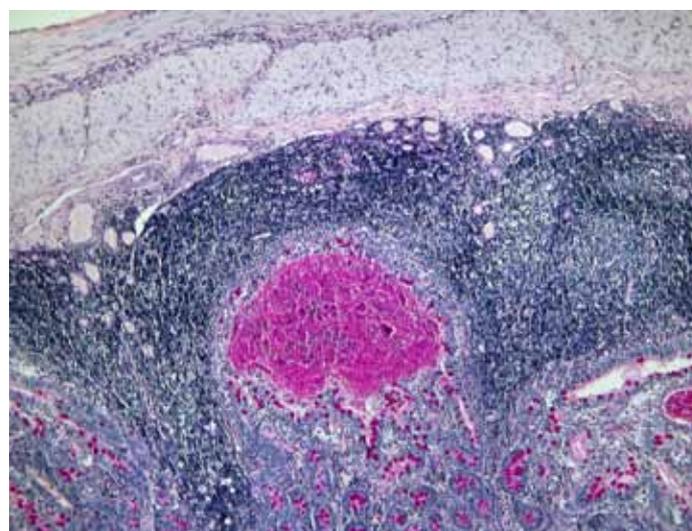


Figure 2: Enteritis cystica profunda in a bullock, mucin filled cysts in the submucosa

The case was considered notable due to the rarity of the condition in cattle and the extent of the lesions throughout the small and large intestine. The predisposing cause was not identified.

Yew poisoning in a cow

Yew tree (*Taxus bacatta*) poisoning was diagnosed in a three-year-old cow submitted for necropsy with a history of sudden death following breaking out into a neighbouring field.

Examination of the rumen contents revealed the presence of finely masticated yew tree leaves. Two similar cases were also reported and one of these also involved the ingestion of *Pieris* species.

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.

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 249 bovine faecal samples. 11 samples (4.4 per cent) contained acid-fast organisms typical of MAP.

Of 3510 bovine blood samples that were tested for antibodies to MAP 270 (7.7 per cent) were positive.

Reproductive and mammary diseases

Abortion specimens from 114 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 65 cases (57 per cent).

Of these, *Salmonella* Dublin (20 cases, 17.5 per cent), was the most commonly identified pathogen. Other pathogens identified included *Leptospira* Hardjo (13 cases, 11.4 per cent), *Bacillus licheniformis* (11 cases, 9.6 per cent), *Neospora caninum* (7 cases, 6.1 per cent), *Arcanobacterium pyogenes* (4 cases, 3.5 per cent), BVDV (4 cases, 3.5 per cent), *Streptococcus* species (4 cases, 3.5%) and *E. coli* (3 cases, 2.6%).

Table 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, October to December 2010

Pathogen	Number	
	Tested	Positive (%)
<i>Cryptosporidium</i> species	494	169 (34.2%)
Rotavirus	476	153 (32.1%)
Coronavirus	479	50 (10.4%)
<i>Escherichia coli</i> K99	208	9 (4.3%)

Table 2: Endoparasitic infections in ruminants in Northern Ireland, October to December 2010.

	No of parasitic ova							% positive
	Total	Negative	+	++	+++	++++		
Liver fluke								
Bovine	1137	945	156	34	2	0	16.9%	
Ovine	194	157	21	14	1	1	19.1%	
Paramphistome								
Bovine	1057	641	198	161	38	19	39.4%	
Ovine	163	126	23	12	1	1	22.7%	
Coccidia								
Bovine	1298	1084	188	15	6	5	16.5%	
Ovine	211	80	101	23	5	2	62.1%	
Strongyle worm egg count								
		<500 epg	≥500 epg					
Bovine	972	909	63				6.5%	
Ovine	185	134	51				27.6%	

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

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

A dairy herd showed sudden drop in milk yield over a period of ten to fourteen days with lethargy, pyrexia and a responsive clinical mastitis in individual animals. *Leptospira* Hardjo microscopic agglutination test showed high IgM titres whilst parallel ELISA testing indicated low or nil IgG titres, indicating acute stage infection.

Abortion due to *Neospora caninum* infection was diagnosed on the basis of brain histology in an aborted seven-month foetus from a second calver cow. The history indicated that a dog kennels was situated beside the grazing.

Mastitis

A total of 590 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases.

Fifty seven (9.6 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 127 samples.

Streptococcus uberis was the most frequently isolated organism and accounted for 18.8 per cent of isolates cultured. Other frequently identified organisms included:

Escherichia coli (18.1 per cent), *Staphylococcus aureus* (11 per cent), other *Streptococcus* species (10.2 per cent), *Bacillus* species (8.6 per cent), other *Staphylococcus* species (8.1 per cent), *Enterococcus* species (4.9 per cent), *Enterobacter* species (3.1 per cent), *Streptococcus dysgalactiae* (2.5 per cent), *Pseudomonas* species (2.4 per cent), and *Aerococcus* species (2.2 per cent).

Neurological diseases

Clostridium botulinum type D toxin was detected in three suspect bovine botulism cases during the 4th quarter of 2010. In one instance an outbreak in beef heifers was preceded by flooding of the pasture

Brain abscesses

Two cases of brain abscessation were diagnosed at necropsy during the reporting period; the first in a one-year-old heifer; the other is a sixteen-month-old heifer (Figure 3).

In both cases *Arcanobacterium pyogenes* was cultured from the pituitary gland and pituitary

fossa. In the latter case there was traumatic damage with infection of a broken horn stump and this may have been the portal of entry of infection in this case.

Other Diseases

Cardiovascular system diseases

Two cases of exsanguination were diagnosed during the reporting period, the first in a two-year-old Charolais heifer presented for necropsy in October. There was a large retro-peritoneal haematoma in the dorsal abdomen containing approximately five litres of clotted blood continuous with a ruptured aneurysm in the abdominal aorta at the level of the right renal artery.

In the second case, a five-year-old cow suffered a tear of the caudal vena cava 2cm caudal to the pericardium with evulsion of the caudal portion of the vena cava. A large blood clot was present in the right side of the pleural cavity.

Lymphosarcoma in a cow.

Lymphosarcoma was diagnosed in a three-year-old cow on the basis of necropsy and histological examination. The chest cavity was found to be full of bloody fluid, with fibrin clots attached to the pericardium.

There were pale discrete nodules of various sizes evident throughout the myocardium and sub-epicardium. There were also multiple pale nodules throughout the pulmonary tissue and mediastinum, extending into the abdomen along the course of the aorta. Histological examination revealed multi-focal lymphosarcoma comprising



Figure 3: Pituitary abscessation in a heifer.

rather uniform small lymphocytes showing a high mitotic index, with marginal invasion of the lung tissue. There was a light fibrous stroma present. Serology for enzootic bovine leucosis was negative.

SHEEP:

Respiratory diseases

Respiratory disease was identified in 15 ovine postmortem submissions during this quarter. *Mannheimia haemolytica* (seven cases), laryngeal chondritis (five cases), jaagsiekte (three cases), bronchopneumonia (one case) and fibrinous pleurisy (one case) were the most common diagnoses.

Alimentary diseases

Copper poisoning

Six instances of copper poisoning were recorded during the reporting period. Liver copper levels ranged from 184.7 ug/g to 748 ug/g wet tissue and kidney copper levels ranges from 34.9 ug/g to 149 ug/g (reference range >25µg/g.).

Forest flame poisoning

Nine cases of Forest flame (*Pieris*) poisoning in ewes were diagnosed during the reporting period. *Pieris* is the most common poisonous plant identified in ruminal contents by VSD and seasonality of poison cases may reflect adverse pasture conditions. Interestingly, in one case histological examination of lung tissue revealed the presence of significant amounts of ingesta associated with bacterial growth in the alveoli and airways. It was noted that several toxins produced by the closely related *Rhododendron* species cause vomiting in ruminants. There were two case of *Rhododendron* poisoning during the reporting period.

Parasitic disease

A six-month-old lamb was submitted for necropsy in October with a history of two previous deaths in a batch of 95 lambs grazing a fourteen acre field which had recently been flooded. Parasitic gastro-enteritis was the primary disease process diagnosed with a strongyle species egg count of 1900 epg. *Bibersteinia trehalosi* was recovered from the lung and liver. *Campylobacter* spp and *Escherichia fergusonii* were recovered from the small intestine.

These bacterial infections were considered to be secondary to the debilitation caused by the parasitic gastro-enteritis.

Johne's disease

Seven ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. One sample (14.3 per cent) contained acid-fast organisms typical of MAP. Four ovine blood samples were tested for antibodies to MAP, two of which were positive.

Reproductive diseases

Specimens from 16 ovine abortions and stillbirths were examined during the 4th quarter. Significant pathogens were detected in 11 cases (68.8 per cent). Of these, *Chlamydophila abortus* was the most commonly identified pathogen and was detected in 5 cases (31.3 per cent). Other pathogens identified included, *Toxoplasma* (3 cases, 18.8 per cent) and *E. coli* (3 cases, 18.8 per cent).

Neurological diseases

One case of listeriosis was confirmed by postmortem examination during the 4th quarter of 2010.

Skin diseases

No cases of sheep scab were confirmed during the 4th quarter of 2010.

Other diseases

An eighteen-month-old ram was submitted from a group with a history of swollen heads. At necropsy, severe tearing was found in the tissues at the left side of the base of the tongue with associated haemorrhage and necrosis. There were purulent sinus tracks and cellulitis extending into the musculature and connective tissue of the oropharynx and cranial neck. Dosing gun injury was thought to be the most likely cause.

Aortic rupture cranial to the heart was diagnosed in an eight-month-old lamb submitted for necropsy with respiratory signs. It was suggested that recent handling stress may have precipitated the rupture.

HORSES:

All 21 swabs that were examined for the presence of *Tayorella equigenitalis* were negative.

Two swabs were cultured from horses with a history suggestive of strangles, one of which was positive.

Parasitic disease

Cyathostomiasis was diagnosed in a three-year old donkey on the basis of full necropsy and histological examination of large bowel tissue. Large numbers of inhibited Cyathostome larvae were seen in the mucosa of the large intestine. Advice was given on appropriate anthelmintic treatment of the grazing group.

Strongylosis and parasitic endarteritis were diagnosed in an eight-year-old donkey submitted following a period of recumbency. At necropsy the main findings were of multifocal aortic and mesenteric artery endarteritis (Figure 4) with *Strongylus vulgaris* nematodes present and secondary myocardial and renal infarction.



Figure 4: Parasitic endarteritis in a donkey

Incidentally within the peritoneal cavity there were multifocal plaques, composed of necrotic adipocytes with occasional mononuclear infiltrates surrounded by mineralisation. Such lesions were possibly secondary to historic vitamin E deficiency.

BIRDS: Poultry

Ascites was detected in four 6 to 7 week-old broiler chickens. Twenty birds in a flock of 100 being reared in a redundant pig house had died over several weeks. Management options including reducing the dietary energy intake, dimming lights and feed re-formulation were discussed as were house ventilation and waste gas control.

Air sacculitis due to *Pseudomonas aeruginosa* infection was diagnosed in a unit with high losses amongst young chicks.

BIRDS: Cage and aviary

Avian tuberculosis was diagnosed in an adult pigeon with enteric lesions. On histological examination there was severe, diffuse villus blunting and fusion with diffuse infiltration of the lamina propria by foamy macrophages. Ziehl-Neelsen staining showed intra-macrophage acid fast bacteria to be present.

WILDLIFE AND EXOTICS

Hepatic amyloidosis was diagnosed in an adult white-faced tree duck (*Dendrocygna viduata*) that was found dead after a spell of bad weather. No inter-current chronic infection could be identified and it was presumed that this was a case of stress-induced amyloidosis.

Incidents of coumarin poisoning in a fox and ethylene glycol (antifreeze) poisoning in cats were investigated during the reporting period.

Viral haemorrhagic disease was diagnosed in a group of ten pet dwarf rabbits; advice was given on future control by vaccination.

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.