

## Disease Surveillance and Investigation Branch

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

- abomasitis due to *Candida albicans* in a two-week-old calf
- copper poisoning in a three-month-old calf
- larval paramphistomosis in 3-4 month-old lambs
- fowl typhoid (due to *Salmonella Gallinarium*) in a batch of 40-week old layers
- suspected closantel toxicosis in bongos

### CATTLE:

#### Respiratory diseases

Respiratory disease was identified in 60 cattle postmortem submissions between July and September 2012. The most common pathogens identified included *Mannheimia haemolytica* (eleven cases), *Dictyocaulus viviparus* (9 cases), *Trueperella (Arcanobacterium) pyogenes* (five cases), *Pasteurella multocida* (five cases), *Mycoplasma bovis* (four cases), peri-parturient respiratory distress (3 cases), *Histophilus somni* (one case) and bovine Parainfluenza-3 virus (one case).

Nine cases of pneumonia due to *Dictyocaulus viviparus* were diagnosed during the period. In one such case an adult cow was submitted in late August from a herd with a history of coughing in adult cows at grass. IBR vaccination did not alleviate the symptoms and the cows were treated with a pour-on product containing ivermectin and closantel. Cows continued to exhibit respiratory distress after treatment and some were subsequently treated with antibiotics.

Postmortem examination of a submitted carcase revealed *Pasteurella*-type pneumonia superimposed on a patent *Dictyocaulus viviparus* infection. Subsequent treatment of the herd with a pour-on product containing eprinomectin was reported to cause a marked clinical improvement.

#### Alimentary diseases

##### BVD / Mucosal disease

Of 2450 blood samples that were tested for bovine viral diarrhoea virus (BVDV) by virus isolation or antigen capture ELISA 206 (8.4 per cent) were positive. In addition, nine of 307 (2.9 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.

##### 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 2012

Pathogen	Number	
	Tested	Positive (%)
<i>Cryptosporidium</i> species	148	37 (25.0%)
Rotavirus	187	42 (22.5%)
Coronavirus	56	8 (14.3%)
<i>Escherichia coli</i> K99	185	2 (1.1%)

TABLE 2: Endoparasitic infections in ruminants in Northern Ireland, July to September 2012

	No of parasitic ova						
	Total	Negative	+	++	+++	++++	% positive
<b>Liver fluke</b>							
Bovine	851	784	54	11	1	1	7.9%
Ovine	376	332	26	12	4	2	11.7%
<b>Paramphistome</b>							
Bovine	852	599	152	75	18	8	29.1%
Ovine	375	335	27	10	2	1	10.7%
<b>Coccidia</b>							
Bovine	1004	705	227	38	13	21	29.8%
Ovine	465	118	260	54	27	6	74.6%
<b>Strongyle worm egg count</b>							
		<500 epg	≥500 epg				
Bovine	973	918	55				5.7%
Ovine	441	326	115				26.1%

≥ 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.

Abomasitis due to *Candida albicans* was diagnosed in a two-week-old calf which had been receiving treatment for diarrhoea. At postmortem examination there were multifocal to coalescing red-black lesions (3 cm to 7 cm diameter) extending through the full thickness of the abomasal wall with associated fibrinous adhesions on the serosal surface (Figure 1). Histologically there was a fibrinonecrotic abomasitis with severe thrombosis and numerous branching filamentous hyphae. *Candida albicans* was recovered on bacteriology.

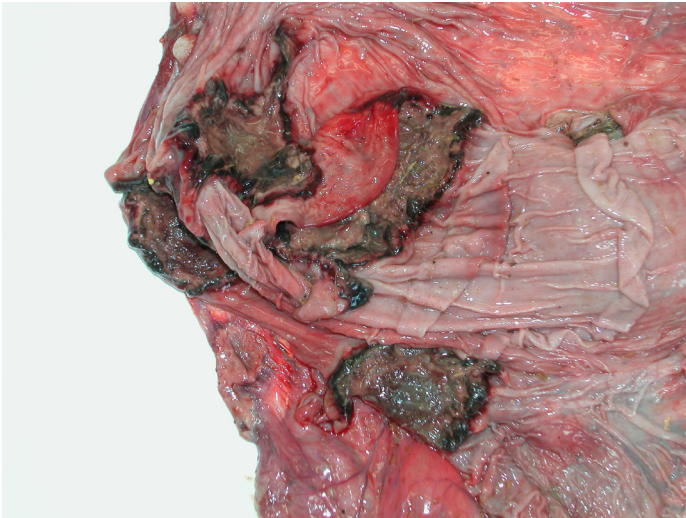


Figure 1: Multifocal mycotic abomasitis in a two-week old calf due to *Candida albicans*

## Johne's disease

Examination for *Mycobacterium avium* subsp. *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 259 bovine faecal samples. Eighteen samples (6.9 per cent) contained acid-fast organisms typical of MAP. Of 3038 bovine blood samples that were tested for antibodies to MAP 349 (11.5 per cent) were positive.

## Nutritional and metabolic

Two cases of copper poisoning were seen during the period. Both had markedly elevated tissue copper levels and histological evidence of hepatocellular necrosis.

In one of these cases a three-month-old calf was being treated for symptoms of pneumonia for approximately 24 hours, but failed to respond and died. Several other calves were also reported as being affected. At necropsy the calf was noted as being well developed with diffuse jaundice, a bronzed liver, distended gall bladder and orange coloured urine. Liver copper levels were recorded as 242 µg/g and histology showed widespread centrilobular hepatocellular necrosis and haemorrhage.

## Reproductive and mammary diseases

### Abortion

Specimens from 81 bovine abortions and stillbirths were examined during the quarter. Significant pathogens were detected in 35 cases (43.2 per cent). Of these, *Salmonella* Dublin (11 cases, 13.6 per cent) was the most commonly identified pathogen. Other pathogens identified included *Neospora caninum* (9 cases, 11.1 per cent), *Bacillus licheniformis* (3 cases, 3.7 per cent), BVDV (3 cases, 3.7 per cent), *Leptospira* Hardjo (2 cases, 2.5 per cent) and *T. pyogenes* (2 cases, 2.5 per cent).

A bovine foetus from a dairy herd was aborted at approximately day 231 of gestation (based on crown-rump length measurement). The animal had hydrocephalus and was negative for bluetongue and Schmallenberg viruses by RT-PCR.

### Mastitis

A total of 918 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. One hundred and twenty six (13.7 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 148 samples. *E. coli* was the most frequently isolated organism and accounted for 21.8 per cent of isolates cultured. Other frequently identified organisms included, *Streptococcus uberis* (18.1 per cent), *Staphylococcus aureus* (8.8 per cent), *Streptococcus species* (8.5 per cent), non-haemolytic *Staphylococcus species* (6.4 per cent), alpha-haemolytic *Streptococcus* (5.3 per cent), *Bacillus cereus* (4.6 per cent) and *Streptococcus dysgalactiae* (4.5 per cent).

## Neurological diseases

### Botulism

*Clostridium botulinum* type D toxin was diagnosed in two cases during the 3rd quarter of 2012.

### Other neurological

A five-month-old calf died after a period of shaking. At postmortem examination a large brain abscess was found extending through the right cerebral hemisphere. No bacteria were cultured from the lesion.

## Other diseases

### Bovine neonatal pancytopenia

Cases of bovine neonatal pancytopenia continue to be recorded with six cases being diagnosed this quarter. All cases except one had gross evidence of widespread haemorrhages in multiple organs. All cases were aged between one to three weeks of age. All were confirmed as cases of bovine neonatal pancytopenia on the basis of histological examination of bone marrow (femoral and sternal) which showed trilineage depletion.

**SHEEP:****Respiratory diseases**

Respiratory disease was identified in eleven ovine postmortem submissions during this quarter. Included in these submissions was one case of Jaagsiekte and one case of laryngeal chondritis.

**Alimentary diseases****Johne's disease**

Fifteen ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. No samples contained acid-fast organisms typical of MAP. Nine ovine blood samples were tested for antibodies to MAP, 2 (22 per cent) of which was positive.

**Parasitic gastroenteritis**

Continuing diarrhoea, recumbency and death (approximately eight deaths) was reported in a group of 3-4 month-old lambs despite treatment with moxidectin and clostridial/pasteurellosis vaccination. A lamb from the group was submitted for examination in late September. At necropsy the lamb was in poor condition with heavy perineal faecal straining. Approximately 37,500 immature paramphistomes were detected in the small intestine confirming larval paramphistomosis. Large numbers of strongyles (6100 egg) were also found in caecal contents.

**HORSES:****Reproductive disease**

Eight swabs were examined for the presence of *Tayorella equigenitalis* during this quarter, all of which were negative.

**Respiratory disease**

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

**Neurological diseases**

A 15-month-old horse was submitted with a history of wasting for an unspecified period, acute diarrhoea and death. At necropsy the caecum was dilated with fluid contents. On histology the liver had multifocal hepatocellular necrosis with associated suppurative inflammation. Moderate amounts of *Listeria monocytogenes* was recovered from the liver, lung and spleen.

**Alimentary diseases**

An eight-year old mare was submitted with a history of sudden death. At necropsy the caecum, colon and small intestine were distended with gas. Large amounts of yew leaves were found in the stomach.

**BIRDS POULTRY****Alimentary diseases**

Fowl typhoid (due to *Salmonella Gallinarum*) was diagnosed in a batch of 40-week old layers that were suffering from acute mortality. Eight birds that were

submitted for necropsy were bright and alert at the time of euthanasia and all had ample supplies of body fat. Grossly all had multifocal pale foci in the livers. Other gross findings included enlarged spleens (3/8) and blood-tinged caecal contents (2/8). Consistent histological findings included multifocal hepatocellular necrosis and suppurative inflammation with periportal lymphoid infiltrates. *Salmonella Gallinarum* was cultured from livers and spleens of all birds.

**BIRDS OTHER**

Fifty out of 1500 pheasants were found dead without any reported premonitory signs. No significant abnormalities were seen grossly in six submitted live for necropsy. *Erysipelothrix rhusiopathiae* was recovered from multiple tissues along with histological changes consistent with infection by this organism.

**WILDLIFE and EXOTICS****Respiratory**

An adult male iguana (*Iguana iguana*) from a zoo was reportedly anorexic for three days before dying. Nothing significant was noted grossly at necropsy. Histologically the lungs had a multifocal suppurative interstitial pneumonia from which *Salmonella enterica* subsp *Arizonae* and *E. coli* were recovered.

**Skin**

An adult female royal python (*Python regius*) had a reported history of dermatitis on its ventral scales of a few weeks duration. The condition improved with treatment but then returned and the animal then developed clinical signs of respiratory distress and died. At necropsy the animal had a severe ulcerative dermatitis (Figure 2) of approximately one third of its ventral abdomen and the cranial lung was markedly thickened with multifocal white lesions (<1mm). Histologically there was a marked interstitial pneumonia with myriad associated bacterial colonies. *Pseudomonas aeruginosa* was recovered from multiple tissues including the lung and skin. Although the snake presented with an apparent infectious problem, *Pseudomonas* is usually only an opportunistic pathogen and therefore it was advised that consideration should be given to ruling out any possible predisposing factors such as environmental concerns (stress, temperature, humidity etc).



Figure 2: Ulcerative dermatitis on the ventral aspect of an adult royal python. *Pseudomonas aeruginosa* was cultured from multiple tissues.

### Urinary diseases

Two adult cats were submitted for necropsy at the end of July with suspect poisoning. The cats had presented to their local veterinary surgeon with reported acute onset dullness, twitching and neurological signs. It was suspected by the owner that there was an association between the symptoms and herbicide spraying by the local council. Despite symptomatic treatment both cats died. At necropsy both animals had widespread marked to severe subcutaneous oedema. Histologically the kidneys of both animals had many multifocal pale yellow-green translucent acicular radiating crystals filling and occluding most renal tubules with associated necrosis of tubular epithelial cells. The crystals were consistent with ethylene glycol (antifreeze). There was no association with the spray being used by the local council.

### Neurological diseases

Five bongos (*Tragelaphus eurycerus*) out of a group of six were reported to have a one-week history of neurological signs consisting of ataxia, depression, stupor and blindness. The animals had received treatment with a flukicide two days before the onset of clinical signs. Animals were euthanised when they showed continued deterioration and recumbency (Figure 3). All animals continued to eat and drink with support until euthanasia. The single animal from the treated group that did not show any clinical signs was a male kept separate for management reasons.

At necropsy no gross abnormalities were found. Histologically changes were found at all levels of the brain examined including the cerebral cortex, thalamus, cerebellum, pons and brain-stem. Changes consisted of marked rarefaction and spongy vacuolation / degeneration of white matter mainly in a perivascular pattern. Multifocally the grey matter also showed spongy degeneration but to a much lesser degree than the white matter. Lesions were most

severe in the cerebrum and least in the cerebellum, although there was variation between the cases in the level of pathology in the cerebellum. Staining for myelin using Luxol fast blue showed that lesions of spongy degeneration corresponded with loss of myelin staining (Figure 4). There was no associated

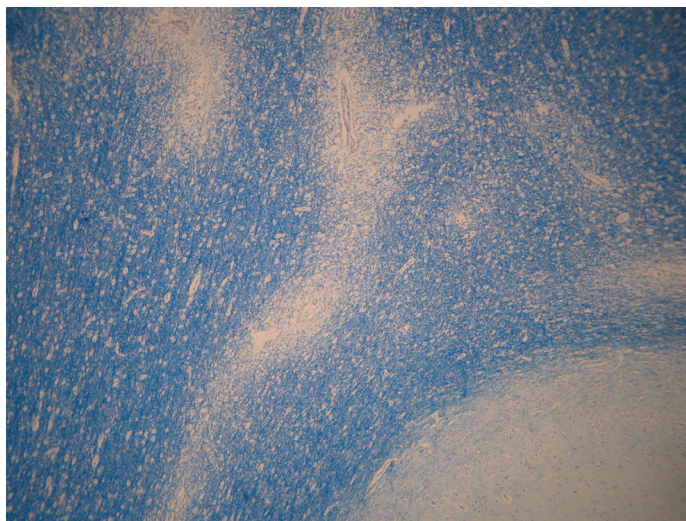


Figure 4: Bongo: Section through the cerebral cortex at the level of the thalamus. Rarefaction and vacuolation of the white matter tracts is clearly visible, particularly in a perivascular pattern. Luxol-fast myelin stain. X100.

inflammatory reaction or cellular infiltrate in any of the lesions. Spongy vacuolation / degeneration of white matter extended into the spinal cord but these lesions were of less severity than those in the brain. Severe changes were also found in the eyes of affected animals with haemorrhage, oedema and vacuolation of the optic nerve and retina. These changes seen in the neurological tissues were consistent with those described in closantel toxicosis.



Figure 3: Adult female bongo euthanised after a week-long history of neurological signs, blindness and recumbency.

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.