

**Northern Ireland animal disease  
surveillance report  
January to March 2007**

- Hypomagnesaemia in a suckler calf
- Complex vertebral malformation in a calf
- Renal amyloidosis in a ewe
- *Salmonella* Typhimurium in pigs
- Suspect ragwort toxicity in a stallion

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for January to March 2007.

**CATTLE:**

**Respiratory diseases**

Pneumonia was the principal pathological finding in 80 carcass submissions between January and March 2007. *Mannheimia haemolytica* (12 cases), *Pasteurella multocida* (9 cases), *Mycoplasma bovis* (7 cases), *Arcanobacterium pyogenes* (6 cases) and *Histophilus somni* (5 cases) were the most common pathogens detected.

One case involved a six-month old calf, which had been weaned the previous day. At postmortem examination five ribs on the left side of the chest were found to have been fractured and were partially

healed with malunion and sequestration. A significant adult lungworm infection was present and bovine viral diarrhoea virus (BVDV) antigen was detected in the spleen. *Mannheimia haemolytica*, *Pasteurella multocida* and *Arcanobacterium pyogenes* were isolated from the lungs.

A ten-day-old calf, which had been hypersalivating and dyspnoeic, was submitted for postmortem examination in March. The calf had been treated with antibiotics. One other calf had died the previous week with similar clinical signs. Lesions typical of calf diphtheria were seen grossly and an acute, necrotising laryngitis with substantial loss of epithelium was seen histologically. No significant bacteria were isolated from the diphtheritic lesions, but numerous filamentous bacteria and foci of small rod-like bacteria were observed histologically. *Salmonella* Dublin was isolated from the small intestine.

**Alimentary diseases**

**Bovine Virus Diarrhoea / Mucosal disease**

A total of 737 blood samples were tested by virus isolation or antigen capture ELISA for bovine viral diarrhoea virus (BVDV). Of these, a positive result was obtained from 73 samples (10 per cent). In addition 273 submitted tissues and nasal mucus samples were tested by

immunofluorescence for BVDV, with 14 (5 per cent) being found positive. Three cases of mucosal disease were confirmed at postmortem examination during this quarter.

Bloods were received from 27 cows, aged 3 years and over, in a herd which had a history of weak and ill-thriven calves, and some fatal scour cases in cows. Twenty of the 27 cows were seropositive for BVDV, with one of the seronegatives testing positive for BVDV in serum.

Blood samples were received from a bull and fourteen 10-14 month old Friesian heifers, with a history of diarrhoea and ill thrift. Eleven (including the bull) were seropositive to BVDV. The 4 seronegative animals were all positive for BVDV.

#### 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, January to March 2007.

Pathogen	Number tested	Number positive (per cent)
<i>Cryptosporidium</i> species	581	191 (32%)
Rotavirus	384	106 (26%)
Coronavirus	383	17 (4%)
<i>Escherichia coli</i> K99	290	14 (5%)

A 12-day-old Charolais calf, with a history of diarrhoea for the previous four days, was submitted for postmortem examination in January. The calf was from a batch of 200, from which 4 others had died from diarrhoea. Vaccination for rotavirus, coronavirus and *Escherichia coli* K99 was undertaken in this beef suckler herd. The calf had been treated with antibiotics.

Lesions typical of fungal rumenitis, caused by *Candida*, were seen both grossly and histologically. This infection is often associated with prolonged use of oral antibiotics. In addition, significant numbers of cryptosporidial oocysts were present in the caecal contents.

A two-day old Limousin suckler calf, which died after having antibiotic treatment for diarrhoea, was submitted for examination in February. Two other calves had diarrhoea, one of which subsequently died. Salmonellosis had been diagnosed in the herd in 2006. *E.coli* K99 was recovered in large numbers from the caecal contents and was considered likely to have been the cause of enteritis.

## 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, 01/01 to 31/03 2007.

	Total	No of parasitic ova					% positive
		Negative	+	++	+++	++++	
<b>Liver fluke</b>							
Bovine	364	318	37	7	2	0	12.6%
Ovine	58	50	5	3	0	0	13.8%
<b>Coccidia</b>							
Bovine	427	358	54	7	5	3	16.2%
Ovine	74	45	17	6	4	2	39.2%
Strongyle worm egg count		<500 epg	≥500 epg				
Bovine	374	365	9				2.4%
Ovine	64	57	7				10.9

≥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 (Ziehl-Neelsen staining) on 246 bovine faecal samples. Twenty samples (8 per cent) contained acid-fast organisms typical of MAP. A total of 816 bovine blood samples were tested for antibodies to MAP; 138 samples (16 per cent) were positive.

Blood samples were received from seven cows with a history of loss of condition over the previous year. All cows had low plasma albumin levels. On serology, 4 of the 7 animals were seropositive for MAP.

A six-year-old Friesian cow was submitted for postmortem examination in February. Despite a good appetite the cow had gradually lost weight. The cow



**Figure 1:** Johne's disease. Hypertrophy of intestinal mucosa

had been treated for worms and liver fluke. Lesions typical of Johne's disease were seen both grossly (Figure 1) and on histopathological examination. Acid-fast organisms were present in Ziehl-Neelsen stained impression smears of the intestines and in Ziehl-Neelsen stained histological sections.

### Reproductive and mammary diseases

#### Abortion

Specimens from 136 bovine abortions were examined between January and March 2007. Pathogens associated with bovine abortion were detected in 74 cases (54 per cent). Of these *Leptospira* Hardjo was the most commonly identified pathogen, being detected in 21 cases (15.4 per cent of total submissions). *Bacillus licheniformis* was isolated from 10 cases (7.4 per cent), *Arcanobacterium pyogenes* was isolated in 10 cases (7.4 per cent), *Neospora caninum* infection was diagnosed in 8 cases (5.9 per cent), *Aspergillus* was isolated from 4 cases (2.9 per cent), *S. Dublin* was isolated from 4 cases (2.9 per cent) and *Listeria* was isolated from 4 cases (2.9 per cent).

### Mastitis

A total of 851 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. Fifty-two (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 158 samples. *E. coli* was the most frequently isolated organism and was present in 24 per cent of samples where microorganisms were identified. *Streptococcus uberis* was cultured in 15 per cent of samples, *Staphylococcus aureus* was isolated in 12.5 per cent of samples and *Streptococcus dysgalactiae* was isolated in 3.4 per cent of samples. *Staphylococcus* (excluding *S. aureus*), *Enterococcus* and *Bacillus* species were isolated in a large number of samples (8.3 per cent, 6.1 per cent and 7.7 per cent respectively). *Arcanobacterium* was isolated in 1.2 per cent of samples. Two organisms uncommonly present in mastitis cases were also isolated: *Pasteurella multocida* (0.47 per cent) and *Pseudomonas aeruginosa* (0.24 per cent).

A ten-year-old cow, with suspected toxic mastitis, was submitted for postmortem examination in March. The cow had calved nine days previously and had been treated with both intramammary and systemic antibiotics.

An acute mastitis was present in one quarter. The quarter was hard, swollen and contained yellow-tinged milk. Ecchymotic haemorrhages were seen in the subcutaneous tissues, the mesentery and the serosal surfaces of

the forestomachs. *E.coli* was cultured from the mastitic quarter.

### Nervous diseases

A one-day-old Simmental calf, which was unable to rise after a normal, full-term calving, was euthanased and submitted for postmortem examination. The calf had been displaying head swaying and jerky leg movements.

The right ventricle of the brain was very enlarged with attrition of the cerebral cortex on the right side. In addition, there was a subdural haematoma in the right side of the calvarium. These lesions were typical of hydrocephalus. Examination for BVDV was negative.

A blood sample submitted in February from a three-month-old beef suckler calf with ataxia, excessive mastication and seizures on handling. The calf was suckling and had access to concentrates and silage. On handling for blood sampling the animal had a tetanic spasm, but responded to calcium/magnesium treatment.

The magnesium and calcium levels in the blood sample were 0.22mM (reference range: 0.73-1.31mM) and 1.33mM (reference range: 2.0-2.8mM) respectively, indicating hypomagnesaemia.

### Other conditions

A one-week-old calf, which had been anorexic and diarrhoeic, was submitted for postmortem examination. Navel-ill and joint-ill were present and the zinc sulphate turbidity test indicated that

insufficient colostral antibodies had been absorbed. The histological findings of severe multifocal hepatic necrosis were consistent with listeriosis, and *Listeria monocytogenes* was isolated in a septicaemic pattern.

A shortened neck, vertebral and skeletal abnormalities were detected in a premature Holstein calf. The calf weighed 21kg. In the hindlimbs there was a medial deviation at both tarsal joints. There was also a medial deviation of the left foreleg at the carpal joint. Vertebral abnormalities included fusion of the last cervical and the first two thoracic vertebrae. There was narrowing of the spinal canal at the first thoracic vertebra. Spinous processes of the first 4 thoracic vertebrae were of increased height.

There were ten pairs of ribs with non-parallel intercostal areas which increased in width peripherally. No cardiac abnormalities were detected and tests for BVDV were negative.

The skeletal abnormalities (Figure 2)



**Figure 2:** Vertebral body fusion, increased length of thoracic spinous and costal malformations in a calf with Complex Vertebral Malformation

described in this calf are similar to those of complex vertebral malformation (CVM). CVM was first described in calves in Denmark in October 1999 (Agerholm and others, 2001, *Journal of Veterinary Diagnostic Investigation*, Jul; 13 (4): 283-289). The condition is caused by a simple recessive genetic defect and therefore requires both parents of an affected calf to be carriers. Testing at the Dr van Haeringen Laboratorium in the Netherlands confirmed that both the herd bull and the dam were heterozygous carriers of the CVM gene and that the foetus was homozygous affected.

## SHEEP

### Reproductive diseases

Samples from 174 ovine abortions were examined from January to March 2007. Recognised pathogens were detected in 122 cases. Of these toxoplasmosis was detected in 42 cases (24.1 per cent of total submissions), *Chlamydophila abortus* (EAE) was detected in 35 cases (20.1 per cent), leptospirosis was detected in 20 cases (11.5 per cent), *Campylobacter spp.* were detected in 8 cases (4.6 per cent), *Arcanobacterium pyogenes* was detected in 4 cases (2.3 per cent), *Salmonella dublin* was detected in 2 cases (1.1 per cent) and *Listeria monocytogenes* was detected in 1 case (0.6 per cent).

### Nutritional and metabolic diseases

Blood samples were received from six ewes approaching lambing. All were recumbent and twitching. In all cases calcium and magnesium levels were within the normal range.

Beta-hydroxybutyrate levels ranged from 4.4 to 9.2mM (reference range: 0-1.5mM), indicating pregnancy toxæmia.

### Alimentary diseases

Contagious pustular dermatitis (orf) lesions around the mouth and nostrils and a mild fibrinous peritonitis were detected at post-mortem examination of a five-week-old lamb, that was found in recumbency and died a short time later. *Mannheimia haemolytica* was isolated in septicaemic pattern from the carcass.

Three five-week-old lambs, from different dams, which were found dead were submitted for postmortem examination in March. Two of the lambs had an intestinal torsion and chronic peritonitis.

An oedematous abomasitis was detected at postmortem examination of the third lamb. *Clostridium sordellii* was demonstrated in the abomasum by immunofluorescence.

### Johne's disease

A total of 8 ovine faecal samples were examined microscopically (Ziehl-Neelsen staining) for *Mycobacterium avium* subspecies *paratuberculosis* (MAP).

One sample (12.5 per cent) was positive. A total of 4 ovine blood samples were tested for antibodies to MAP. All of the samples were negative

### Respiratory diseases

Pneumonia was identified as the principal pathological finding in 11 ovine carcass submissions during the 1st quarter of 2007. *Mannheimia haemolytica* was the

most common cause, having been isolated in three cases.

A three-week-old lamb, which died within 24 hours of presenting with clinical signs of breathlessness and pain, was submitted for postmortem examination in March. Four other lambs had been found dead in this flock. A lobar pneumonia and abomasitis were present. *Mannheimia haemolytica* was isolated in septicaemic pattern.

#### Nervous diseases

A one-week-old lamb with paraplegia was euthanased and submitted for postmortem examination. A purulent arthritis was seen in both the carpal and hock joints and a spinal abscess was present in the body of the second cervical vertebra. *Streptococcus dysgalactiae* was isolated from both the spinal abscess and the affected joints. Twelve cases of listeriosis were confirmed by postmortem examination during the 1st quarter of 2007.

#### Skin diseases

No cases of sheep scab were detected during this quarter.

#### Other conditions

A one-week-old lamb was submitted for postmortem examination in January. Four other lambs from this flock had died within the previous three days. The flock had been vaccinated for pasteurellosis and clostridial diseases. Liver abscessation typical of necrobacillosis, caused by *Fusobacterium necrophorum* infection was present. However, the causative organism was not isolated.

A three-year-old Texel-cross ewe, which had died suddenly, was submitted for postmortem examination in January. The carcase had a pronounced uraemic smell and the kidneys were enlarged, pale and mottled on incision. A fibrous pericarditis and fibrous pleural and pericardial adhesions were also present. A severe chronic interstitial nephritis was seen on histopathological examination. The glomeruli were distended with homogenous eosinophilic material that showed green birefringence with Congo Red stain under polarising illumination, indicating amyloid. Many proximal and distal tubules were dilated with non-cellular homogenous eosinophilic material. The likely cause of death was kidney failure, but the fibrous pericarditis and pleural-pericardial adhesions may also have been significant contributory factors.

#### PIGS:

#### Alimentary diseases

Three weaner pigs, with a history of diarrhoea, were submitted for postmortem examination. Increased mortality was reported on this unit. Two of these pigs had fibrinous enteritis. A purulent polyarthritis was seen in the third pig. *Salmonella* Typhimurium phage type U288 was isolated from the large and small intestine of each pig.

#### Other diseases

Porcine circovirus 2 (PCV2) was commonly detected in porcine postmortem submissions during this quarter.

A 13-week old pig, which was in good

condition, was submitted for postmortem examination. Bronchopneumonia and pulmonary oedema were observed. The kidneys were enlarged and there were numerous small, pale foci in the renal cortices. A severe interstitial nephritis and acute glomerulonephritis with fibrinoid necrosis and haemorrhage were seen histologically. Positive immunoperoxidase labelling with PCV2 antigen was associated with the renal lesions. Moderate levels of PCV2 antigen were observed in cryostat section of lymph node.

Three six- to ten-week-old pigs, with a herd history of wasting, scouring and high mortality, were submitted for postmortem examination. One pig was jaundiced.

The other two pigs were thin, small for the stated age, and had enlarged lymph nodes. In one of these pigs, the liver was enlarged, discoloured and exhibited an apparent nodular hyperplasia of the hepatoparenchyma. Histologically the hepatoparenchyma contained very large numbers of macrophage giant cells. In the other pig, approximately five *per cent* of the lungs was consolidated, mainly towards the margins of the cranioventral lobes. Histologically large numbers of macrophage giant cells were associated with the peribronchial lymphoid tissue. In both cases, immunoperoxidase labelling revealed large amounts of PCV antigen associated with the macrophages. In all three of these pigs, PCV-2 antigen was detected in the lymph nodes in moderate to high amounts.

## AVIAN:

### Poultry

Two chickens from a backyard flock, with a history ill thrift, lethargy and anorexia were submitted for postmortem examination. The trachea of one chicken was congested and an acute necrotising tracheitis was seen histologically. The liver was enlarged and histologically a severe acute hepatitis was present. Polymerase chain reaction (PCR) results for avian influenza (AI) virus matrix protein and infectious laryngotracheitis virus (ILTV) were positive. PCR for AI strains H5 and H7 and N1 were negative, and the ILTV isolated was indistinguishable from vaccine strains. *Pasteurella* spp. were also isolated in large numbers and in a septicaemic pattern from this bird. The other chicken had a mottled liver and scaly leg. Focal hepatic necrosis and a chronic periportal hepatitis were seen histologically. *Knemidocoptes mutans* (scaly leg) mites were found in the skin of the legs.

### Other avian

*Salmonella* Typhimurium was isolated from swollen elbow joints in two six-week old racing pigeons from a loft of 140 birds, which were submitted for postmortem examination. No other birds in the pigeon loft were affected and no other clinical signs were observed. The owner was advised to cull any other pigeons which developed wing lameness or diarrhoea.

*S. Typhimurium* is a well-recognised cause of joint inflammation in adult



pigeons, particularly the elbow joint (wing boil).

## HORSES:

Nine hundred and twenty-nine blood samples were tested for equine viral arteritis by virus neutralisation test.

Nineteen samples were positive.

Three hundred and ninety swabs were examined for the presence of *Tayorella equigenitalis*. All were negative.

Twenty-five swabs were cultured from horses with a history suggestive of strangles. *Streptococcus equi* was detected in 4 samples from 4 separate premises.

Periportal fibrosis, bile duct proliferation and megalocytosis were detected histologically in a 13-year-old stallion; these lesions are suggestive of ragwort toxicity. Another 28-year-old pony had hepatic fibrosis, but megalocytosis (which is a significant finding in ragwort toxicity) was not present in this case. A further 14-year-old pony had a moderate adult liver fluke infection. *Fasciola hepatica* infection is uncommon in horses, but has been seen previously at these laboratories.

A 10-year-old horse was euthanased due to progressive ataxia, hind leg weakness and incoordination. No abnormalities were seen grossly, but a mild Wallerian degeneration was present histologically at all levels of the spinal cord. An undetected focal lesion in the caudal spinal cord was suspected.

Material from 12 equine abortions was

received during the quarter. In seven of these no significant pathogens were detected. Leptospiral antigen was detected in two foetuses and *Corynebacterium spp.* and *Streptococcus zooepidemicus* were detected in one foetus each. A further foetus was jaundiced and hepatoparenchymal necrosis was seen histologically; however no significant pathogens were detected.

## OTHER SPECIES:

### Canine

A four-year old Labrador dog died shortly after the onset of fitting. A white-coloured powder was detected in the stomach at post-mortem examination and this was subsequently confirmed to contain alphachloralose.

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.