Agri-Food and Biosciences Institute

Northern Ireland disease surveillance Quarterly Report

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Northern Ireland animal disease surveillance report, 1st July to 30th September 2007

- ***Salmonella* Typhimurium infection in a dairy herd**
- **Chronic pancreatitis in a calf**
- **Amyloidosis in a cow**
- **Circovirus-associated gastric ulceration in a pig**
- **Steatitis in a donkey foal**

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for 1st July to 30th September 2007.

CATTLE:

Respiratory diseases

Pneumonia was the principal pathological finding in 44 carcase submissions between 1st July and 30th September 2007. *Dictyocaulus viviparus* (fourteen cases), *Mannheimia haemolytica* (seven cases) *Pasteurella multocida* (five cases), *Mycoplasma bovis* (five cases) and *Arcanobacterium pyogenes* (four cases) were the most common pathogens detected.

One case involved a six-month-old calf, which was found dead in September after briefly showing clinical signs of respiratory distress. Three other calves had died within the previous two weeks. The only access this calf had to pasture was for a five-day period approximately six weeks previously. A severe parasitic pneumonia was seen at postmortem examination.

In a number of cases more than one pathogen was detected. A sixteen-month-old bullock that had a history of coughing and anorexia for the previous two days was examined *post mortem*. Other cattle in this herd of 120 had been coughing and there had been three other deaths within the previous two weeks. A parasitic pneumonia, with numerous *Dictyocaulus viviparus* lungworms in the trachea and bronchi, was present. *Mannheimia haemolytica* was also isolated from the lungs and infectious bovine rhinotracheitis virus (IBRV) detected by immunofluoresence.

Alimentary diseases

BVD / Mucosal disease

A total of 411 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 67 samples (16.3 per cent). In addition 205 submitted tissue and nasal mucus samples were tested by immunofluorescence for

BVDV, with 17 (8.3 per cent) being found positive.

A two-month-old calf, which had shown clinical signs of hypersalivation, was examined *post mortem*. Extensive ulceration was seen on the buccal mucosa and the lateral aspects of the tongue. The epithelium on the dorsum of the tongue was also thickened and necrotic in appearance. Extensive ulceration with the presence of fibrinous tags was seen on the oesophageal mucosa. Ulcers were present on the caudal aspects of all four feet. BVDV was confirmed by immunofluoresence.

A three-month-old Shorthorn-cross calf, which had had diarrhoea for the previous three weeks, was examined *post mortem*. The calf had been treated with antibiotics and anticoccidials. No other calves in the batch had shown similar clinical signs. Necrotising full-depth ulcers, which were associated with *Candida spp*. spores, were seen in the oesophagus and ileum. The ruminal epithelium was also severely affected. Immunofluoresence for BVDV was negative. Candidiasis is often seen following excessive use of antibiotics.

A 10-month-old calf, which had been weak and lethargic the previous day, was examined *post mortem*. The calf had been treated with antibiotics and antispasmodics. Emphysema was seen in the abomasal submucosa. Immunofluoresence for *Clostridium sordellii* was positive.

Salmonellosis was diagnosed in a dairy herd of 180 cows, which had been vaccinated for leptospirosis, IBRV and BVDV. Twenty-one unvaccinated heifers had been purchased at the beginning of August. Ten days later one of the heifers showed clinical signs of IBRV infection and subsequently developed severe blood-stained diarrhoea. Two days later 20 cows were depressed and had profuse blood-stained diarrhoea; many of the remaining cows also had non-bloody diarrhoea. *Salmonella* Typhimurium was isolated from faeces samples. The herd milk yield dropped from 3600 litres per day before this outbreak to a low of 2200 litres per day, before subsequently levelling out at 3100 litres per day.

Salmonella Kottbus was isolated from the faeces of a home-bred six-year-old Charolais cow. A small cluster of *Salmonella* Kottbus on four farms from one geographical area had been previously diagnosed by VSD during the fourth quarter of 2006.

Failure to respond to treatment led to a five-month-old calf being euthanased. The calf had been anorexic and was losing condition for the previous month. At postmortem examination an enlarged, cavitated pancreatic mass, approximately five to six cm in size was seen (Figure 1).

Two circumscribed abomasal ulcers

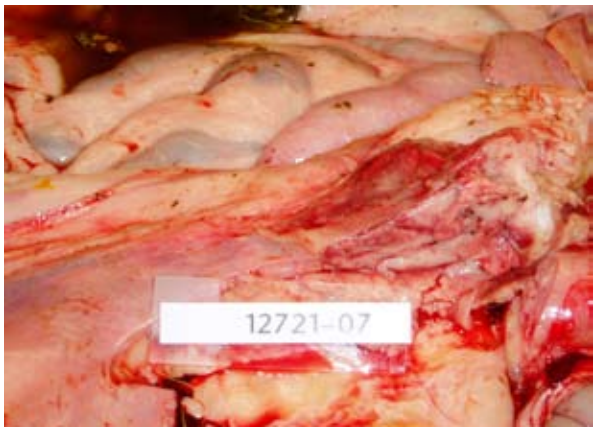

FIGURE 1: Pancreatitis in a cow

were also present. Histological examination of the pancreas revealed a chronic inflammatory reaction with pancreatic cell hyperplasia, necrosis and vascular thrombosis. Chronic interstitial pancreatitis is uncommon in cattle and its aetiology is unknown. However, the lesion in this case may be due to a localised spread of infection from the abomasal ulcers. No significant bacteria or viruses were detected in the calf and the pancreatic lesion was considered the most likely cause of the calf's inappetence and general deterioration.

Neonatal enteritis

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

Other enteric conditions

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

TABLE 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, 1st July to 30th September 2007

	Number	
Pathogen	**Tested**	**Positive (per cent)**
Cryptosporidium species	131	38 (29.0%)
Rotavirus	90	20 (22.2%)
Coronavirus	86	0 (0.0%)
Escherichia coli K99	37	3 (8.1%)

TABLE 2: Endoparasitic infections in ruminants in Northern Ireland, 1st July to 30th September 2007

		No of parasitic ova					
	Total	**Negative**	**+**	**++**	**+++**	**++++**	**% positive**
Liver fluke							
Bovine	362	319	35	5	2	1	11.9%
Ovine	122	104	13	3	1	1	14.8%
Coccidia							
Bovine	454	322	106	7	5	14	29.1%
Ovine	162	32	95	24	9	2	80.2%
Strongyle worm egg count		**<500 epg**		**≥500 epg**			
Bovine	404	368		36			8.9%
Ovine	144	112		32			22.2%

≥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 183 bovine faecal samples. Nine samples (4.9 per cent) contained acid-fast organisms typical of MAP. A total of 696 bovine blood samples were tested for antibodies to MAP; 94 samples (13.5 per cent) were positive.

Reproductive and mammary diseases

Abortion

Specimens from 95 bovine abortions were examined between 1st July and 30th September 2007. Pathogens associated with bovine abortion were detected in 48 cases (46.3 per cent). Of these *Salmonella* Dublin was the most commonly identified pathogen, being detected in 10 cases (10.5 per cent of total submissions). *Leptospira* Hardjo was cultured from nine cases (9.5 per cent), *Neospora caninum* infection was diagnosed in nine cases (9.5 per cent), *Bacillus licheniformis* was cultured in seven cases (7.4 per cent), *Streptococcus* was cultured from four cases (4.2 per cent), *Arcanobacterium pyogenes* was cultured from 4 cases (4.2 per cent) and *Listeria monocytogenes* was cultured in two cases (2.1 per cent).

Two bovine foetuses, aborted at approximately 187 and 256 days gestation respectively, were submitted from the same dairy herd. There was no history of vaccination for abortifacient agents on this farm. *Salmonella* Dublin was isolated in large numbers from both foetuses. Leptospiral antigens were also detected by immunofluoresence from tissue samples.

Mastitis

A total of 1483 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. 127 (8.5 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured from a further 268 samples. *Escherichia coli* was the most frequently isolated organism and was present in 21.2 per cent of samples from which microorganisms were identified. *Streptococcus uberis* was cultured from 20.4 per cent of samples, *Staphylococcus aureus* was isolated from 11.2 per cent of samples, *Corynebacterium bovis* was isolated from 3.1 per cent of samples and *Streptococcus dysgalactiae* was isolated from 1.8 per cent of samples. Both *Staphylococcus* (excluding *S. aureus*) spp and *Pseudomonas* spp were isolated from a large number of samples (10.1 per cent and 8.7 per cent respectively).

S. uberis was the most numerous isolate in 40 quarter milk samples from 10 cows in a dairy herd that had been experiencing high cell counts. *S. dysgalactiae* was also isolated from three quarters of one cow in the herd and *Staphylococcus intermedius* was isolated from two quarters of a further cow and from a herd bulk milk sample.

Nervous diseases

A two-year-old heifer became recumbent and died the following day. Five other cattle showing similar clinical signs had recently died in this herd. Botulism was suspected by the referring veterinary practitioner and all at-risk cattle had been vaccinated for botulism two days before this heifer died. No significant abnormalities were seen grossly, but *Clostridium botulinum* type D toxin was demonstrated in the small intestinal contents and faeces.

A three-month-old calf that had been treated unsuccessfully for cerebrocortical necrosis (CCN) was euthanased and examined *post mortem*. One other calf in the group that had shown similar clinical signs the previous week had responded to treatment. Flattened gyri, with reduced grey matter showing peach-coloured foci, were seen in the brain. An encephalomalacia, typical of CCN, was seen histologically.

Other diseases

A yearling heifer that had shown clinical signs of dullness, staring eyes, jugular vein distension and severe submandibular and cervical oedema was euthanased and examined *post mortem*. A large, pale mass, approximately 15cm in diameter, was present in the thymus at the level of the thoracic inlet and several small pale nodules were seen in mesenteric lymph nodes. Lymphosarcoma was diagnosed by histology. Examination for enzootic bovine leucosis was negative.

Two yearling bullocks, from a group of 25 at grass, were found dead and submitted for postmortem examination. One other bullock from this group had also been found dead. Yew tree (*Taxus baccata*) leaves were found in the rumen of both bullocks (Figure 2).

FIGURE 2: Yew tree leaves.

A yearling calf was found dead near a yew tree that recently had some branches sawn off. At postmortem examination septal oedema with overlying fibrinous pleurisy was seen in the lungs. Dark foci with some emphysema were seen in the myocardium and lesions typical of blackleg were present in the psoas muscles. Fluorescence for *Clostridium chauvoei* was demonstrated in the myocardium, pleura and psoas muscle. Yew leaves were not found in the rumen.

An eight-year-old cow died after a period of regurgitating its diet. Multiple haemorrhages were seen grossly in the renal cortex. Histologically the renal interstitium contained a large amount of pale-staining eosinophilic non-cellular material, typical of amyloid.

A five-year-old cow, which had shown signs of drooling and swelling of the

face, collapsed while being examined. The cow was euthanased and examined *post mortem*. A cellulitis was present on the right side of the face and the middle upper molar had an abscess containing approximately 2ml of pus at the base of the tooth (Figure 3).

FIGURE 3: Molar tooth abscess

Three abscesses, 1-2cm in diameter, were present in the lungs. *Arcanobacterium pyogenes* was isolated from the cellulitis lesion, and both lung and tooth abscesses.

SHEEP:

Respiratory diseases

Pneumonia was identified as principal pathological finding in eight ovine carcase submissions during the third quarter of 2007. Three cases of laryngeal chondritis were identified. Two of these cases occurred in rams and presented as bilateral abscessation of the arytenoid cartilages of the larynx. A further case was recorded as an incidental finding in a 5-month-old ewe lamb that had died from pulpy kidney disease. In this case a small abscess was present in the right arytenoid cartilage.

One case of Jaagsiekte (ovine pulmonary adenocarcinoma) was diagnosed *post mortem* in a two-year-old ewe, from a 500-sheep flock, that had shown signs of ill thrift prior to euthanasia. Approximately 20 sheep showing similar clinical signs had died within the previous year.

Nervous diseases

Two cases of listeriosis were diagnosed during this quarter. One case involved a five-month-old lamb that had been dull for two days before death. *Listeria monocytogenes* was isolated in septicaemic pattern from the carcase and lesions typical of listeriosis were seen histologically in the brainstem.

A 12-week-old lamb that had been showing neurological signs was euthanased and examined *post mortem*. No abnormalities were seen grossly. A lymphocytic meningoencephalitis, with marked perivascular cuffing in the cerebellum, typical of louping ill, was seen histologically.

Alimentary diseases

Two cases of acute fascioliasis were diagnosed at postmortem examination in September. One case involved a 4-year-old ram that was found dead after having been dull the previous day. Four other deaths had occurred in this flock within the previous two weeks. At postmortem examination the carcase was anaemic and fluke tracts were seen throughout the liver parenchyma. Over 330 immature fluke (four-eight week-old) were present in the liver.

A three-year-old ewe with a clinical history of chronic weight loss was examined *post mortem*. The ileal mucosa was markedly thickened and was coloured yellow. The mesenteric and ilio-caecal lymph nodes were also enlarged. Lesions typical of Johne's disease were seen histologically and numerous acid-fast bacteria were seen in Ziehl-Neelsen stained sections.

Other diseases

Two cases of poisoning caused by *Pieris* species plants were diagnosed during this quarter. One case involved three sheep which had been found dead and another which was showing clinical signs of bloat and dyspnoea. Two sheep were examined *post mortem*. *Pieris* and laurel (*Prunus laurocerasus*) leaves were present in their rumens. Both these plants are poisonous to sheep. *Pieris* contains the same toxins as rhododendron (*Rhododendron ponticum*), the most significant being acetlyandromedol. Laurel contains cyanogenic glycosides.

PIGS:

Respiratory diseases

Three 14-week old pigs were submitted for postmortem examination. Seven pigs had died suddenly in this unit over a five day period. Cranio-ventral consolidation affecting approximately twenty-five *per cent* of the lung volume was seen in each animal. There were focal haemorrhages in the cranio-ventral lobes and fibrinous tags were present on the pleura and on the surfaces of the viscera. *Actinobacillus pleuropneumoniae* and *Pasteurella multocida* were isolated in large numbers from the lung tissue.

Alimentary diseases

A 5-year-old sow that was found dead was examined *post mortem*. A bread baguette approximately 10-15 cm long, was found lodged in the sow's pharynx and had caused complete laryngeal obstruction.

A sixteen-week old pig that had died suddenly was examined *post mortem*. Strands of fibrin were present in the abdomen and the liver was emphysematous with an 'aero chocolate' appearance. Histological examination revealed foci of necrosis with associated neutrophil infiltrates. *Clostridium novyi* was detected in the liver by immunofluorescence. *Clostridium novyi* causes sporadic sudden deaths in pigs, but occurs more commonly in sows or large fattening pigs.

Other diseases

Mulberry heart disease was diagnosed on the basis of gross postmortem and histological findings in four eight-week-old pigs which had died suddenly over a three-day period. Postmortem findings included straw coloured peritoneal effusion, fibrin strands in the abdomen, hydrothorax, hydropericardium and streaky epicardial haemorrhages. The pigs were fed on a commercial diet. The herd owner was advised to treat remaining pigs in affected groups with a vitamin E / selenium preparation and to discuss the level of

vitamin E and polyunsaturated fatty acids in the diet with the feed manufacturers.

A 12-week-old pig was examined *post mortem*. Four other deaths had occurred recently in this 500-pig unit. An ulcer approximately 7cm in diameter was seen in the cardiac area of the stomach. Histologically lymphocytic depletion was seen in both the spleen and lymph nodes and numerous macrophages were present in the spleen. High levels of PCV2 antigen were also detected by immunofluoresence in a mesenteric lymph node that was consistent with those seen in cases of pig circovirus infection. Gastric ulceration is often associated with porcine circovirus infection.

BIRDS:

Poultry

One-week-old broiler breeders, from three houses on the same site, were examined *post mortem*. The birds showed yolk sac infection, septicaemia and septic arthritis, and *E. coli, Pseudomonas aeruginosa* and *Enterococcus spp* were isolated. A significant feature of the *P. aeruginosa* isolate was that it showed resistance to all the antibiotics in the test panel.

An incident of a foreign body in a hen egg, which was submitted by an environmental health officer, was investigated. The foreign body was identified as an ascarid worm. The roundworm *Ascaridia galli* can sometimes migrate from the cloaca up the oviduct and subsequently be included within the egg as it is being formed.

Other avian

Seven euthanased and five dead 12-week-old ducks, from a group of 500, were examined *post mortem*. Fifteen ducks had died within the previous few days. Although the ducks had access to three ponds, only ducks from one particular pond were affected. Variable amounts of lead shot were seen in the gizzards of the ducks and high lead levels were present in two pooled kidney samples (23.9 and 85.5 µg per g respectively).

An adult pigeon, which had a swollen left elbow joint, was euthanased and examined post mortem. The joint contained copious yellow pus. *Salmonella* Typhimurium DT2 was isolated from the intestines and the swollen joint. Arthritis due to *S.* Typhimurium (wing boil) is not uncommon in pigeons.

HORSES:

Six blood samples were submitted for serology for equine viral arteritis by virus neutralisation test. All samples were negative. Eleven swabs were examined for the presence of *Tayorella equigenitalis*. All were negative. Forty-three swabs were cultured from horses with a history suggestive of strangles. *Streptococcus equi* was detected in two samples from two separate premises.

Respiratory diseases

Rhodococcus equi was isolated from abscesses in two three-month-old foals. In one case several abscesses, approximately 1-2 cm in diameter, were seen throughout the lung parenchyma. There had been a history of foals not thriving in this group and nine other foals had died. The second foal had an abscess, approximately five cm in diameter, adhering to the caecal mesentery. Pulmonary oedema with alveolitis was seen histologically.

Alimentary diseases

An 18-month-old pony was euthanased after failing to respond to antibiotic therapy. On postmortem examination severe, ventral, subcutaneous oedema was present. Hydrothorax was also present. The liver was firm and mottled in appearance. *Salmonella* Typhimurium was isolated from the intestines. A Coggins test for equine infectious anaemia was negative. Histologically, a mild tracking fibrosis with associated biliary hyperplasia was seen. The subcutaneous ventral oedema seen in this case may have been the result of septicaemia and disseminated intravascular coagulation.

Other diseases

A recently purchased 4-year-old donkey died after a short illness. On postmortem examination hydropericardium and focal haemorrhages in the ventricular myocardium and liver were seen. Myocardial infarction and hepatic periacinar congestion and necrosis were seen histologically.

A 3-week-old donkey foal died after a brief illness. Two other foals in this group had died in similar circumstances. On postmortem examination the carcase fat was a yellow/orange colour. A subacute steatitis with areas of necrosis was seen histologically. Steatitis in foals is associated with vitamin E and or selenium deficiency.

A stallion was euthanased after failing to respond to treatment. The horse had been showing signs of encephalopathy (head pressing and incessant walking) prior to euthanasia. On postmortem examination the liver was firm in texture. The liver parenchyma was mottled with multiple pale foci present. Diffuse fibroplasia, bile duct proliferation and marked megalocytosis consistent with ragwort poisoning were seen histologically.

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.