

# Quarterly review of diagnostic cases – July to September 2007

## New Zealand Veterinary Pathology

### Cattle

A single four-week-old calf from a mob of 40 in the Waikato was found circling and having seizures, and died soon after. Blood lead analysis revealed levels of 1.8 mg/l, consistent with **lead toxicity**. In another case, a four-week-old calf from the Manawatu was euthanased after exhibiting a sudden onset of nervous signs. Liver analysis revealed lead levels of 8.8 mg/kg. In cattle, levels higher than 4 mg/kg are suggestive of toxicity.

A cow from the southern Waikato that aborted recently had a *Leptospira pomona* microagglutination titre of  $\geq 1:1600$ . Bovine virus diarrhoea (BVD) antigen testing and *Neospora* immunofluorescent antibody (IFA) testing were negative. *Leptospira pomona* was considered the likely cause of the **abortion**.

A group of calves in the Bay of Plenty had increased mortality and morbidity. One calf died and two others were severely depressed, with apparent blindness and stiff neck. Cytology of cerebrospinal fluid from the dead calf revealed a moderate septic meningitis with numerous intracellular bacilli present. Culture of the cerebrospinal fluid produced a pure growth of alpha-haemolytic *Streptococcus*, confirming **streptococcal meningoencephalitis**.

A yearling bull in the Manawatu died suddenly, with few premonitory signs. Necropsy by the field veterinarian showed severe thickening of the oesophageal and oral mucosa. Histology revealed severe ulcerative oesophagitis with numerous bacterial colonies present in the necrotic tissue. There was also marked vasculitis, and numerous PAS-positive fungal organisms were present within vessels. The lungs had a severe mycotic pneumonia. Numerous renal infarcts were present. Lesions were consistent with **disseminated fungal disease**, perhaps compounded by necrobacillosis. The lesions probably arose from systemic spread of a mycotic or necrobacillary rumenitis, secondary to carbohydrate overload.

A group of yearling Jersey bulls in the Waikato exhibited illthrift. Faecal egg counts and BVD antigen testing gave no significant results, but *Yersinia pseudotuberculosis* was cultured from the faeces of four animals. **Yersiniosis** was diagnosed.

Five of 50 cows in the Waikato died suddenly after being shifted to a new paddock. Plant material from the paddock and rumen content from one of the dead cows had detectable levels of cyanide. **Cyanide toxicity** (from ingestion of cyanogenetic plants) was diagnosed. In a similar case, one paddock on a property in the Waitomo area was associated with deaths each spring. Postmortem of a cow that died

Each quarter, Surveillance publishes a review of selected diagnostic cases handled by New Zealand's diagnostic laboratories. These cases do not necessarily reflect the national disease profile but they do represent diseases of interest to the livestock industries or of significance to wildlife or companion animals.

in the paddock showed moderate amounts of 'swamp grass' in the rumen. Rumen contents were positive for cyanide, suggesting this was another case of cyanide toxicity.

A property in the Northern Waikato had about 10 yearling heifers die in the space of six to eight weeks. Necropsy of several showed severe oesophageal and oral ulceration, enteritis, abomasitis and colitis. Histologic findings revealed marked enteritis with cryptal and Peyer's patch necrosis, consistent with BVD. BVD antigen testing on spleen was positive in three animals tested. On two of these animals, sequencing to type the BVD virus identified it as BVD type I. This ruled out the possibility of type II acute BVD. **Mucosal disease** was diagnosed. It appears that the property experienced infection of naïve pregnant cows with BVD virus, resulting in the birth of a group of persistently infected calves. These animals later (as yearlings) experienced infection by a cytopathic strain of the virus, resulting in an outbreak of clinical mucosal disease. A similar situation seems to have arisen on a few other farms in the area this year; on one property in the Waikato four of a group of poorly doing yearling heifers were persistently infected with the BVD virus.

A group of four-week-old calves in the Bay of Plenty had severe diarrhoea. Rotavirus and *Cryptosporidium* tests were negative but culture for *Salmonella* produced **Salmonella Ruiru**. This is an unusual isolate in New Zealand and is only occasionally isolated from diarrhoeic calves and adult cattle.

### Sheep

Routine scanning of a Texel cross flock in the Waikato revealed that 10% of the animals were not pregnant. The scanner believed half were carrying dead fetuses. Three ewes were culled and the laboratory found the uteri of two contained dead and autolysed fetuses suspended in abundant necrotic and suppurative material. The other uterus had retained fetal membranes with a suppurative endometritis. Culture of samples from all three uteri featured a heavy growth of *Arcanobacterium (Actinomyces) pyogenes*. From one of the animals the culture was pure but in the others it was mixed with environmental contaminants. Selective culture and/or enrichment for *Listeria*, *Salmonella* and *Campylobacter* was negative. Histology revealed all animals had a marked suppurative endometritis with bacterial colonies visible. Early embryonic death caused by *Arcanobacterium (Actinomyces) pyogenes* was diagnosed.

Several deaths occurred in a mob of sheep in the Nelson area over the course of one week after feeding on poor quality balage. All the dead animals were found near the water supply in the paddock. Necropsy of one ewe showed marked pulmonary congestion with myocardial petechiation. The intestine appeared grossly inflamed and there were no solid faeces in the distal colon. Histologic examination revealed an acute suppurative gastroenteritis with abomasal infarction and terminal septicaemia. Culture of the mesenteric lymph node yielded a heavy growth of Gram-positive rods consistent with *Listeria* spp.

A mob of 40 ewes in the Waitomo area experienced five abortions over a short space of time. Histology on three aborted lambs revealed a marked suppurative placentitis with a suppurative fetal pneumonia in all cases. Culture of stomach content from two lambs produced a heavy growth of *Listeria ivanovii*.

## Deer

Twelve of a group of 300 wapiti and wapiti crosses in the Bay of Plenty died over a three-week period, after exhibiting illthrift and marked weight loss. The submitting veterinarian necropsied a 10-month-old wapiti and noted marked emaciation with a lack of peritoneal fat stores. Mesenteric lymph nodes were prominent and the small intestinal wall was moderately thickened. Histology revealed marked mucous metaplasia with lymphocytic abomasitis and numerous nematodes embedded in the mucosa of the abomasum. The small intestine featured a marked granulomatous enteritis and lymphadenitis. **Ostertagiasis** with concurrent **Johnes disease** was diagnosed.

An adult deer from a farm in the Taupo area with a history of sudden death with diarrhoea was necropsied by the submitting veterinarian, who observed changes in the lung consistent with **lungworm**. Moderate numbers of nematodes consistent with *Dictyocaulus* spp were observed histologically in the bronchi. The intestines were too autolysed for histologic assessment but culture of intestinal content indicated concurrent infection with *Yersinia pseudotuberculosis*.

## Alpacas

An alpaca from the Blenheim area had been born with a wry nose, had poor skeletal development and swelling around the fetlocks. Serum phosphate levels were 0.75 mmol/l. Normal serum phosphate level for this species is approximately 1.9–3.4 mmol/l. This hypophosphataemia, together with the clinical signs, is consistent with a diagnosis of **rickets**.

A three-month-old female cria from the South Waikato presented with severe diarrhoea. Faecal egg count was 1,275 eggs/gram, and *Yersinia pseudotuberculosis* was isolated from the faeces, suggesting concurrent **gastrointestinal parasitism** and **yersiniosis**.

## Pigs

Sudden death of four 12-week-old pigs occurred in a 30-sow

piggery. The pigs were thin and severely icteric. On histological examination the most significant abnormalities were present in the liver, which had a marked chronic vacuolar hepatopathy with single cell necrosis. These findings were considered most consistent with **porcine circoviral infection**.

## Horses

A 12-year-old shire gelding in the Central Plateau region exhibited sudden onset of profuse salivation and lethargy. The horse recovered rapidly one or two hours later after it was moved from its grazing paddock. The paddock was considered a risk for arsenic contamination because of its location in a volcanically active area. The owner's dog had died suddenly two days earlier with a similar syndrome of profuse salivation. Analysis of sediment from a puddle in the paddock revealed an arsenic level of 13.7 mg/kg. The highest admissible level of arsenic in general foodstuffs for people is 0.2 mg/kg. This suggests the levels in the paddock may have been high enough to cause **arsenic toxicity** in the horse.

An adult horse in the Bay of Plenty exhibited weight loss and diarrhoea. *Salmonella Typhimurium* was isolated from the faeces, confirming salmonellosis. In a similar case, an adult horse in the King Country had severe diarrhoea with rapid weight loss, and was also positive for *Salmonella Typhimurium*.

Two foals from a property in the Waikato exhibited coughing and had a mucopurulent nasal discharge. Cytology on a transtracheal wash from one revealed severe septic inflammation with neutrophils containing coccobacilli. Culture of transtracheal wash samples from both foals yielded a heavy growth of *Rhodococcus equi*.

## Dogs

A two-month-old Rhodesian ridgeback in the South Auckland area presented with severe haemorrhagic gastroenteritis. Eighteen pups on the same premises were at risk. The sick pup had large numbers of coccidial oocysts in the faeces, and faecal culture was positive for *Campylobacter coli*. A parvovirus antigen test on faeces was negative. Concurrent **coccidiosis** and **campylobacteriosis** were diagnosed.

## Birds

An eight-year-old cockatoo had recently been re-homed and was inappetent and very thin. A mildly increased CK of 1,394 IU/l (normal up to about 400), and an AST of 483 IU/l (normal range 40–300) were considered to reflect muscle damage from recent handling. Serum zinc levels were 46 µmol/l, which equates to 3 ppm. **Zinc toxicity** in cockatoos has been associated with serum zinc levels greater than 2 ppm. In another case, a two-year-old galah presented with lethargy. The bird had been chewing on its cage and x-rays revealed radio-dense fragments in its gizzard. The bird had a serum zinc level of 214 µmol/l (approximately 14 ppm), well above the toxic range for this species. Analysis of paint flakes from the galah's cage revealed that the paint contained 2,150 mg/kg of zinc, suggesting the paint was zinc based and the cause of the toxicity.

A two-year-old pigeon in Wellington presented with severe weight loss. Smears made from a crop wash revealed numerous flagellate organisms amongst abundant keratinised squames. **Trichomoniasis** was diagnosed.

A nine-year-old parrot was taken to a veterinarian in Canterbury to have a wing clip. The beak was noted to be slightly deviated. The next morning, the owner found the bird depressed and vomiting and it died shortly after. Necropsy revealed numerous white foci over the liver and spleen. *Yersinia pseudotuberculosis* was isolated, suggesting septicaemic **yersiniosis** as the cause of death.

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## Gribbles Veterinary Pathology

### Cattle

Through the spring period, once calf rearing is underway, diarrhoea emerges as a major limitation to successful rearing. During the first week of life, **K99 E coli** is the primary pathogen causing problems. In a shed of 300 Jersey calves in the Wairarapa, 15 had profuse, watery diarrhoea and four died. Diarrhoea developed within the first 24 hours of life, and most calves recovered after intense fluid therapy. A faecal sample from a four-day-old calf was positive for K99 *E coli* on an ELISA.

During the first month of life, rotavirus and cryptosporidia are frequent causes of calf diarrhoea. In a case from Manawatu, six Friesian calves died, and six more from a mob of 50 were ill. The calves developed light green, bloody diarrhoea and died quickly. Moderate to heavy numbers of **cryptosporidia** were detected on stained faecal smears.

Another more pathogenic cause of calf scours is **Salmonella Typhimurium**. In one Hawke's Bay case, six 14-day-old Friesian-cross calves from a shed of 71 stopped drinking. The next day three were dead with evidence of diarrhoea staining the perineum. Moderate to heavy growth of *Salmonella Typhimurium* was cultured from the faeces of each dead calf. In another case in Hawke's Bay, from a shed of 100 Friesian calves, four had diarrhoea and two were dead. *Salmonella Typhimurium* was cultured from intestinal content of one dead calf.

From six to eight weeks of age onwards, **coccidia** can cause bloody mucoid diarrhoea. In a mob of 236 Friesian calves in Hawke's Bay, 50 had diarrhoea and 20 died. Moderate to heavy numbers of coccidial oocysts were visible in faecal samples from three of four calves.

As calves are released into paddocks around the rearing pens and become more inquisitive, **lead toxicity** is often seen. Three calves died from a mob of 40 Friesian/Jersey cross calves in Taranaki. Two were found dead and the third was seen convulsing before death. The calves had access to an old battery, rubbish in a dump and flaking paint. Liver lead concentrations were 16.1 mg/kg. Tissue

lead concentrations greater than 5 mg/kg are considered toxic. In another Taranaki case, two one-month-old Jersey calves were found dead with access to lead paint. Blood lead concentrations were 2.1 mg/l. Blood lead concentrations greater than 0.3 mg/l are considered toxic.

From a mob of 45 Friesian yearlings in the Wairarapa, three were recumbent, dyspnoeic, frothing at the mouth and eventually died. Histological examination of the lungs revealed a severe fibrinosuppurative and necrotising **bronchopneumonia** associated with culture of *Histophilus somnus* and *Arcanobacterium pyogenes*.

Four yearling heifers in a mob of 221 died suddenly, two within 24 hours and another two the following day, after an injection of copper. Histological examination of tissues from one animal revealed massive acute hepatic necrosis consistent with acute **copper poisoning**.

The brains and spinal cords from female one- to two-week-old Jersey calves had low to moderate numbers of distended myelin sheaths, some containing macrophages, in the lateral margin of the reticular formation in the section cut through the cerebellar peduncles. Similar mild changes were also seen in the dorsal white matter in the obex. The spinal cord of one calf had distended myelin sheaths in the dorsal white matter tracts. Occasional macrophages were present in these spaces. No changes were detected in the other calf. Similar changes had been seen in a related calf last year. There is a possibility this is an inherited **demyelinating disease**.

### Pigs

Thirty Landrace cross weaner pigs had died over a period of six months on a 100-sow Taranaki pig farm. Typically the weaners faded and died. The farm's worming programme was irregular. A 5 kg piglet submitted for necropsy was in poor condition with ulcerations over bony prominences, and numerous 5–15 mm crusts on the skin of the lower limbs and ventral abdomen. Fat reserves were completely metabolised. Large numbers of coiled nematodes dilated a reddened caecum and colon, consistent with severe *Trichuris* **nematodiasis**.

### Horses

Two histologically confirmed cases of **equine herpes virus abortion** occurred on a property in Canterbury. Seven of 14 mares aborted and the abortions occurred in two clusters three weeks apart – four initially and three later.

Three sporadic cases of **equine herpes virus abortion** and one suspect case occurred at different studs in the Waikato. The three typical cases all had foci of necrosis in the livers and intranuclear inclusions in hepatocytes. The suspect case had no inclusions.

A three-week-old Arab foal died after developing pneumonia. It had consolidated areas of lung at post mortem. The lymph nodes were difficult to find. Histologically the lymph nodes were small and had no lymphoid follicles. No lymphoid follicles were present

in the spleen. Tissue from the thymic area was largely fat with one small nodule of mononuclear cells. The lung had multiple foci of suppurative inflammation containing large colonies of bacteria that seemed to be centred on bronchioles and contained a mixture of cocci and filamentous bacteria. There was loss of bronchiolar epithelium and two possible intranuclear inclusions indicating an adenoviral infection. Severe generalised suppurative pneumonia and necrotising bronchiolitis with severe lymphoid hypoplasia was diagnosed. This is diagnostic of severe **combined immunodeficiency** in Arab foals. There was some evidence of an adenoviral infection that commonly occurs in these foals.

## Dogs

Two histologically confirmed cases of **post-vaccinal distemper** have been seen in dogs from Canterbury during the last 12 months. The first was in a three- to four-month-old Collie cross whose clinical signs developed within days of vaccination. The second case occurred in October this year after a booster dose of the vaccine. Both cases were from the same practice and subsequent enquiries revealed the two dogs were littermates although they had different owners. Considering how widely used these vaccines are it seems likely there is some host peculiarity that made these dogs susceptible to the vaccine-induced disease.

A five-year-old spayed Poodle bitch undergoing immunosuppressive therapy (azothiaprime and dexamethasone) for immune-mediated haemolytic anaemia was biopsied and found to have a necrotising **hepatitis** associated with protozoan parasites resembling *Neospora*, *Hammondia* or *Toxoplasma*. *Toxoplasma* was ruled out using immunohistochemistry. PCR for *Neospora* and *Hammondia* is pending.

A three-year-old spayed Rottweiler bitch was presented with lethargy and fluid distension of the abdomen. Cytology on the fluid revealed an eosinophilic effusion. The eosinophil count in the peripheral blood was  $10.1 \times 10^9/l$  ( $0.1 - 1.5 \times 10^9/l$ ), suggesting a **hyper-eosinophilic syndrome**. Immunosuppressive therapy with steroids reduced the eosinophil count and the abdominal effusion.

## Cats

Two separate cases of fat-associated **dermal mycobacteriosis** were seen in domestic cats from the Hobsonville area of Auckland. The cats were aged nine and 12 years and had disseminated lesions involving the pannicular fat of the dorsum and the sternum.

## Fish

A freshly dead 22.4 kg yellowtail **kingfish** (*Seriola lalandi*) from a fish farm in Northland was presented for necropsy. The fish was from one tank of a brood stock nursery, which had been experiencing illthrift and **sporadic losses**. No gross lesions were found. Histology of the gastrointestinal tract revealed large numbers of superficial intracellular apicomplexan parasites resembling *Epi-eimeria* in the mucosa of the atrophic and inflamed intestine.

No other lesions were found. Subsequently, as part of the same investigation, a number of young grower fish of the same and different species were examined and found not to have the infection. The losses in the brood stock were from only one of a number of tanks. The investigation continues.

Different species of **aquarium fish** from a zoo collection in Auckland were reported to be showing unusual swimming behaviour and increased mortality, suspected to be caused by chronic marine tuberculosis and sporadic infections. A platy that died was examined postmortem. No gross lesions were seen but small numbers of **microsporidian** sporocysts were found at the centre of granulomata in the brain when examined microscopically. The phylum Microsporidia is a mixed group of poorly understood intracellular parasites affecting invertebrates, a few lower vertebrates and humans. They are often an incidental finding in aquarium fish but when they affect the nervous system can be responsible for spinal deformity and swimming irregularities.

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