QUARTERLY REPORT OF DIAGNOSTIC CASES: JANUARY TO MARCH 2012

Gribbles Veterinary Pathology

BOVINE

A two-year-old Friesian cow in North Canterbury presented with multiple pruritic mass lesions over 60 percent of its body. Histological examination of one nodule confirmed the presence of lymphoma.

A 700-cow Canterbury dairy farm had 140 heifers in the milking mob. Twenty of them became sick and three died. The affected heifers presented with respiratory distress, and tissue samples from two revealed a severe fibrinous and neutrophilic pneumonia. A pure growth of Histophilus somni was cultured from the lung from one cow. This organism is not uncommon as a cause of pneumonia in calves in New Zealand, but this presentation in milking heifers is unusual.

Two older cows from a herd of 400 on a mid-Canterbury farm developed profuse diarrhoea within a few days of each other. When the first died it was not necropsied as the farm had a history of Johnne’s disease, to which the farm manager attributed the illness. Relevant in the history was the recent introduction to the feeding regime of baled silage that had been broken into by seagulls. Salmonellosis was suspected by the submitting veterinarian, and serum and faeces samples were sent to the laboratory. Johnne’s serology was negative but a heavy growth of Salmonella Brandenburg was isolated from the faeces. This organism is cultured quite commonly from sheep and in calves, but is less commonly isolated from adult cattle.

Twelve animals from a herd of 150 dairy cows at Maramarua in the Waikato developed acute diarrhoea. The herd was grazing pasture and each animal was also receiving 2–3 kg daily of meal containing a mineral supplement. Faecal culture from two of the affected animals produced a growth of Salmonella Typhimurium, identified as phage type 101 in the one animal that was further tested. The animals were all treated and apart from one mortality they returned to milk. There were no further losses.

Enlargements of the anterior ventral neck region were noticed in a number of smaller six-month-old calves among a mob of 30 on a South Otago sheep and beef farm. The enlargements were confirmed as goitres on clinical examination. Inorganic iodine concentrations in sera of two affected calves were just detectable, at 2 and 7 ug/L (adequate range > 45 ug/L), consistent with these animals having been grazed on iodine-deficient pastures for several months. The affected animals were given both injectable and oral iodine compounds and 10 days later blood samples were taken from both treated and untreated animals. The four treated calves had serum inorganic iodine concentrations averaging 133 ug/L while the untreated calves averaged 23 ug/L. This farm was located in a hilly area of South Otago where iodine deficiency was not previously known.

Two outbreaks of septicaemic pasturellosis caused by Pasteurella multocida were recorded in Southland and Otago. In the first outbreak, four 3-month-old calves in a mob of 90 were found dead over a short period on a Southland farm. Necropsy of two recently dead calves showed a marked fibrinous peritonitis. A P. multocida septicaemia was suggested, based on the necropsy findings and histopathological examination of a range of fixed tissues from one of these calves. Cultures were not carried out. These calves had been brought on to the farm from a neighbouring property after weaning. Initially they were split into two equal-sized mobs but after two weeks (and several days before the deaths started) the farmer combined them again into one large mob in a new paddock as he considered that one of the mobs was running out of feed. The weather at the time was very hot and there was only one water trough. The new paddock was large and had reasonable grass and clover cover so feed was not short, but the lack of rain at this time was probably reducing the amount of dry matter available.

The second outbreak was on a dairy farm where 400 three-day-old bull calves sourced from several local Otago dairy farms were being reared. At weaning they were taken to a run-off, separated into four equal mobs and set-stocked in large blocks with access to plenty of grass and clover. At four months of age, nine calves on one block died over a 10-day period. Two of the most recently dead were necropsied and both showed a severe fibrinous peritonitis and large haemorrhages on the omentum and serosal surfaces. Blood samples collected from both calves at necropsy yielded a heavy pure culture of P. multocida. As a further five calves died over the next couple of days, all surviving animals were given a single injection of a broad-spectrum long-acting antibiotic, after which there were no more deaths. The farmer reported afterwards that the whole mob had picked up and were looking a lot better. As there were no deaths in the other mobs...
of similar-aged calves on this farm, and management
and feeding in all mobs was identical, the cause of this
outbreak in the one mob could not be determined.

Abortions on three dairy farms in the Waikato and one
in the Bay of Plenty, with foetuses around 120 days’
gestation, had lesions consistent with Neospora infection,
and three of these herds also had cows with high titres to Neospora. Foetuses of this age are usually quite autolysed
when aborted and it is unusual to get so many positive for Neospora this early in the season.

A mature Friesian cross dairy cow on a Taranaki farm stopped producing milk and lost weight. On examination
her heart rate, respiratory rate and rectal temperature
were all normal but she had watery diarrhoea. A serum
sample was positive for Johne’s disease by ELISA. In
addition faeces were culture-positive for Salmonella
Lexington.

A group of three-year-old Simmental cows on a
Whanganui farm were mustered in early summer. Good pasture had been available throughout the
spring but the cows were in poor condition. Serum
selenium concentrations from five cows averaged
89 nmol/L (adequate range 140–200) and serum copper
concentrations were 4.5 µmol/L (adequate range 8–18),
confirming selenium and copper deficiency. ELISA tests
for bovine viral diarrhoea virus, Johne’s disease and liver
fluke infection were all negative.

A group of three-year-old Angus cross beef cows on a Wairarapa
farm had diarrhoea and were losing weight despite
therapy. BVDv antigen ELISA tests on serum were
positive for all three, confirming persistent BVDV infection
and mucosal disease.

A group of rising one-year-old heifers on a Taranaki
dairy farm developed persistent diarrhoea. Culture for
enteric pathogens was negative. Faecal egg counts from
the four worst-affected animals were 3750, 9000, 300
and 150 eggs per gram (epg), confirming a diagnosis of significant enteric parasitism. In another case, two
6-month-old dairy weaners from a mob of 40 (also from
Taranaki) developed severe diarrhoea. Faecal egg counts
of these two animals were 26 250 and 3950 strongyle epg,
consistent with severe enteric parasitism.

A six-month-old Jersey bull calf had not grown well since
arriving on a Taranaki dairy farm as a bought-in four-
day-old. Since its arrival the veterinarian had noted that
the bulk tank milk concentration of antibodies to bovine
viral diarrhoea virus (BVDV) had increased significantly.
When a serum sample from the bull was tested by BVD
antigen ELISA the virus was detected, confirming the bull
was persistently infected with BVDV.

Veterinary attention was sought 10 days after a four-year-
old Angus cow had calved on a Tararua beef farm. The
cow had pale mucous membranes, along with melena and
pyrexia. Blood samples confirmed anaemia associated
with neoplastic lymphocytes in circulation. Next morning
the cow was found dead and post-mortem examination
found lymphosarcoma of the liver, kidney, mediastinum,
bone marrow and lymph nodes. Ulcerated lesions in the
small intestinal mucosa revealed the source of the melena.

A group of six-month-old mixed-breed weaner heifers
from the Manawatu were not growing as well as expected.
Measurement of whole blood glutathione peroxidase
concentrations revealed a mean of 1.4 KU/L (adequate
2–50 KU/L), confirming a diagnosis of selenium
deficiency.

OVINE

Eight of 16 mixed-age ewes on a small holding in
Marlborough died over a two-week period. They were
on good pasture and there were no signs of illness before
death. Specimens were sent from one ewe that had
been described at necropsy as anaemic with copious
serous fluid in the abdominal cavity. Nematodes were
present in the abomasum and many were suspected to
be Haemonchus. Histologically, the liver had periaticar
necrosis consistent with hypoxic damage from severe
anaemia, and parasitological examination confirmed
the presence of Haemonchus as well as smaller numbers
of Ostertagia and Trichostrongylus. The ewe’s death was
attributed to haemonchosis.

A mob of 800 lambs on a mid-Canterbury farm were on
a mixture of high-quality grass and wheat stubble. Five
had died within two days. Histological examination of
the tissues of one lamb revealed lesions of yersiniosis
and a superficial rumenitis consistent with carbohydrate
overload. Yersinia pseudotuberculosis was recovered
from the colonic contents.

Sporadic unexplained deaths occurred in a small mob of
11 mature ewes and rams set-stocked on a lifestyle block
in Otago. Lambs running with them were unaffected.
Necropsy of the most recently dead sheep revealed only a
pale yellow, fatty-looking liver. Culture of gut contents for Salmonella was negative but kidney copper concentrations were very high, at 1800 µmol/L (normal < 150), confirming copper toxicity. It was likely that the buildup of copper in the livers of these sheep had occurred slowly over a number of months. The source of the copper was identified when the farmer revealed that he had been feeding sheep nuts to these ewes over the preceding six months; this would also explain why the lambs were unaffected.

There were several outbreaks of nitrate toxicity in lambs during early autumn in south Otago. Most deaths occurred shortly after recently yarded lambs had been placed on new grass paddocks where the grass had developed high nitrate concentrations when rain fell after a long dry spell. In one case 40 hoggets were found dead and in another outbreak 70 out of a mob of 300 hoggets died when they were put on a new grass paddock after being yarded for 36 hours. In most cases diagnosis was based on testing aqueous humour for nitrate concentrations. In one outbreak the toxic pasture was also tested and the nitrate concentration was very high at 3 g/kg DM (toxic level > 0.7).

During autumn there were at least three outbreaks of acute gastroenteric salmonellosis among adult ewes in Southland. In all cases Salmonella Hindmarsh was isolated from the intestinal contents. The mortality rate averaged 6 per day over a 14-day period on most affected farms.

Four cases of salmonellosis caused by Salmonella Hindmarsh were reported from the lower North Island. Fourteen mixed-age ewes had died out of a mob of 2000 on a Wairarapa farm. Culture of intestinal contents and mesenteric lymph node from one dead ewe produced pure growths of Salmonella Hindmarsh, confirming a diagnosis of salmonellosis. In another Wairarapa case, well-conditioned ewes were dying at a rate of one or two per day. Examination of live affected ewes revealed diarrhoea and pyrexia. In a further case, 20 of a mob of 3500 died, also in the Wairarapa. In another case, from Whanganui, one of 10 rams died a month after being purchased, and another was found recumbent and pyrexic with diarrhoea. Salmonella Hindmarsh was cultured from the faeces in each case.

Three lambs died overnight and another was found with red urine, weak, pale and jaundiced. The lambs were part of a mob of 1000 on a Hawke’s Bay farm. A serum sample from the affected lamb had a microscopic agglutination titre to Leptospira pomona of > 1:1600, confirming acute leptospirosis.

Eight 6-month-old mixed-breed rams died among a mob grazing on a farm airstrip in Hawke’s Bay. Histopathology of tissues from one revealed severe abomasitis and enteritis, along with renal nephrosis suspicious of fluorosis from superphosphate toxicity. Further questioning of the farmer and inspection of the airstrip confirmed that superphosphate had been spilled while loading an aircraft, and the rams had eaten this.

CERVINE
A mob of 50 yearling deer were yarded on a very windy day on a Southland deer farm. There appeared to be no problems driving this mob but once they were in the yards a number became very agitated and seven died after a short period of severe nervous signs resembling grass staggers. Blood was taken from affected animals and tested for metabolic diseases, with negative results. Necropsy of a recently dead deer was unremarkable and histopathological examination revealed no lesions in the fixed brain. Examination of the yards and surrounding paddocks failed to identify any potentially toxic agents or plants. The cause of these deaths was not determined.

Sixty hinds had fawned from a mob of 120 that were pregnant in the Waimarino district. Eight of their fawns had died. Post mortem of two others found the abomasum full of clotted milk, and the intestines were filled with creamy white content, which was also pasted onto the perineum, suggesting antemortem diarrhoea. A rotavirus ELISA on faeces from one fawn was positive. Further ELISA tests were all negative for cryptosporidia, coronavirus and E. coli K99 ELISA. Histopathology revealed loss of enterocytes and villous blunting consistent with an enteric pathogen. In addition, crystals were frequent in renal tubules, indicating nephrosis, which was most likely secondary to dehydration. These findings all supported a diagnosis of rotaviral enteritis.

CAPRINE
A six-year-old Saanen doe from the northern region of the South Island had mastitis. Enterobacter spp. were isolated in pure heavy growth from the milk. These organisms are considered to be environmental mastitis pathogens. There was concern that the infection appeared
to be resistant to most of the antimicrobials commonly used to treat mastitis in goats. The submitting veterinarian explained that this group of goats historically had a low incidence of mastitis that had generally been due to *Staphylococcus* spp. It was considered that this was likely an isolated occurrence, but that laboratory culture was advisable when investigating any subsequent cases of mastitis on this property.

**PORCINE**
A pig from a large commercial piggery in Canterbury had symptoms of respiratory disease and was euthanased. *Actinobacillus pleuropneumoniae* was isolated from the lung, confirming *porcine pleuropneumonia*. The isolate was sensitive to all the commonly used antibiotics against which it was tested.

**CANINE AND FELINE**
A castrated adult male cat from central Auckland presented with a history of acute-onset diarrhoea, vomiting and anoxyxia lasting three days. The patient was passing malodorous faeces, which prompted the clinician to suspect salmonellosis. However, on further questioning the owner it was found that for the last three weeks they had been sanding back the weatherboards of an old house (> 40 years old) in preparation for repainting. An EDTA blood sample was found to contain an elevated concentration of lead (0.8 mg/L; toxic level < 0.5), confirming a diagnosis of *lead poisoning*. Gastrointestinal signs are a common presentation in cats with sub-acute lead intoxication.

A six-year-old female Schnauzer presented to a veterinary clinic in Auckland with lethargy, inappetance and jaundice. The dog was from a semi-rural area and was not vaccinated for leptospirosis. The urine was bright yellow with 3+ bilirubin, urine specific gravity of 1.017, and small numbers of hyaline and granular casts. Results of blood chemistry were: urea 41 mmol/L (reference range 2.5 – 9), creatinine 682 umol/L (reference range 48–109), phosphate 5.59 mmol/L (reference range 0.92–1.82), bilirubin 145 umol/L (reference range 1–3), alkaline phosphatase 2382 IU/L (reference range 0–87), alanine transaminase 352 IU/L (reference range 0–88). *Leptospira* DNA was detected by PCR on urine and EDTA blood samples, consistent with *leptospirosis*.

A heading dog of unknown sex and age from Taranaki presented with occasional vomiting, depression, inappetence and mild abdominal pain. It had possibly eaten a possum carcase. Serum biochemistry revealed increased creatinine (856 umol/L; reference range 40–109), urea (70.5 mmol/L; reference range 2.5–9) and phosphate (4.68 mmol/L; reference range 0.92–1.82), all very suggestive of renal failure. Amylase was also elevated, at 2002 IU/L (reference range 0–1074). A measurement of urine SG would have been necessary to definitely diagnose renal failure. The amylase level is increased as a result of decreased renal deactivation with renal failure. PCR was suspicious for *pathogenic leptospires* in the urine. It is possible that the dog was developing an antibody response and starting to clear leptospires from the body and kidneys, and therefore from the urine. Antibody is required to identify the type of leptospire present, i.e., to differentiate *pomona*, *hardjo* or *copenhageni*. With possible ingestion of possum, there are other serovars that may be present, for example *balcanica*.

A heading dog from Taihape presented with a history of anorexia and lethargy over the previous four days and vomiting over the previous two days. It was found to be pyrexic, tachycardic, tachypnoeic and slightly jaundiced. Serum biochemistry revealed marked azotaemia, with creatinine 1035 umol/L (reference range 48–109), urea 66.2 mmol/L (reference range 2.5–9) and phosphorus 7.47 mmol/L (reference range 0.92–1.82). Bilirubin was 61 umol/L (reference range 1–3) and there were mild increases in liver enzymes, with ALP 114 IU/L (reference range 0–87), ALT 174 IU/L (reference range 0–87) and AST 107 IU/L (reference range 0–51). The dog had a titre of 1:1600 to *Leptospira pomona* and was negative for *L. hardjo*. It seems very likely that such a high titre meant the presumed renal failure and hepatobiliary disease was due to *Leptospira pomona* infection. However, a measurement of urine SG would have been needed to confirm renal failure. The presence of organisms in the urine would confirm an active infection.

A six-month-old male Bearded from the Rangitikei presented with severe clinical jaundice. No biochemistry
or haematology was carried out. Urine was sent for PCR and was positive for pathogenic leptospires. Serology was requested and titres of ≥ 1600 to *pomona*, ≥ 1/1600 to *copenhageni* and 1/200 to *hardjo* were obtained, confirming a diagnosis of *leptospirosis*.

A seven-year-old Heading bitch from the Tararua district presented with weight loss and lethargy and was polydypsic. Blood tests revealed a mild azotaemia with creatinine 199 umol/L (reference range 48–109), urea 18.7 mmol/L (reference range 2.5–9) and mild increases in liver enzymes (ALT 242 IU/L; reference range 0–88). A titre of ≥ 1600 to *pomona* was measured, confirming *leptospirosis*. Another dog died from renal failure on this property, possibly from the same cause.

A seven-year-old male Huntaway from Whanganui had increased creatinine (575 umol/L; reference range 48–109) and urea (81.3 mmol/L; reference range 2.5–9), indicative of renal failure. Urine was negative for leptospires by PCR but there was a marked serological response of ≥ 1600 to both *Leptospira pomona* and *L. copenhageni*. This suggests a *leptospiral infection* in which a serological response has occurred and cleared the organisms from the kidney.

**POULTRY**

A group of hens in South Canterbury were displaying signs of respiratory disease. The investigating veterinarian sent a smear from the body cavity of a necropsied bird for cytology, and advised that parasites could be seen in large numbers throughout the body cavity. On examination large numbers of mites were evident in the thick, sanguinous smear. At first it was thought these might have originated from the skin and feathers and contaminated the body cavity during necropsy, but the smears were sent for examination by a parasitologist and were tentatively identified as *Cytodites nudus*, the air sac mite. Small numbers of these mites apparently have little effect on the host, but heavy infestations can be associated with respiratory difficulties and may cause death.

Twelve-week-old chickens in Taranaki were developing ulcerating lesions on the upper surface of their toes. Histopathology revealed ulcerated areas covered by crusts of debris mixed with bacteria, associated with dense inflammation in the dermis. Culture of the crusts yielded heavy growths of *Staphylococcus aureus* and *S. intermedius*.

**NON-POULTRY AVIAN**

A Christchurch aviary had lost several birds over some weeks, and one goldfinch was submitted for necropsy. It had extensive areas of solid lung, and histologically there was a granulomatous pneumonia with massive number of acid-fast bacteria consistent with *Mycobacterium avium* infection.

A three-month-old African grey parrot from Auckland died and fixed tissues were examined. Histopathology of the liver and the spleen revealed hepatocytes with karyomegaly and smudgy amphophilic intranuclear viral inclusions (presumptive avian polyoma virus), and multifocal areas of necrosis with moderate numbers of intralesional thick-walled yeast cells.

A wild thrush was found dead in Auckland. Histopathology revealed numerous protozoal schizonts (presumptive *Plasmodium spp.*) in the spleen, myocardium, skeletal muscle, lung and brain, consistent with *avian malaria*.

A non-breeding male kakariki/yellow-crowned parakeet from Rotorua was examined. The body was damp and very thin, and the carcass weighed only 62 g. The feathers were clumped and abnormal. Many of the primary body feathers were ensheathed, leaving just a plume projecting from the capsule. The neck and head were mostly bare. The internal organs were darkly congested and the liver had extensive multifocal white abscesses. The spleen was congested and moderately enlarged. Histology of the liver revealed multiple foci of necrosis and acute inflammation throughout. These foci often coalesced and there were scattered colonies of bacteria in the necrotic tissue. The skin sections had few feather follicles. There was some degeneration of epithelial cells and the nuclei of these cells had marginated chromatin and intranuclear inclusions. Sections of feathers showed some degeneration of epithelial cells as described above, and one section had quite marked inflammation within the pulp. Diagnoses of severe acute necrotising hepatitis consistent with *salmonellosis* and *psitticine beak and feather disease* were made.

**EQUINE**

A mare of unspecified breed from Canterbury had a severe and chronic pyometra with cervical adhesions. Swabs from both the cervix and uterus yielded heavy growths of *Streptococcus equi zooepidemicus*. The isolate
was fully sensitive to all the commonly used antibiotics against which it was tested.

A nine-week-old foal in Canterbury had gradually lost weight, become dull and lost its appetite. Treatment with antibiotics had no effect. The foal was euthanased and necropsy revealed a large inflammatory mass adhering to the stomach and intestines. Histologically the peritoneum had a marked suppurrative to pyogranulomatous reaction, with masses of gram-positive coccobacilli clustered in the macrophages and in the neutrophilic exudate. The appearance of the bacteria was consistent with \emph{Rhodococcus equi}.

An 11-year-old Canterbury horse had a solitary growth near the medial canthus of one eye. Histological examination revealed a typical \emph{viral papilloma}.

A seven-week-old Standardbred filly on a South Auckland farm presented with mild depression, low-grade fever and injected conjunctival membranes. An abscess was present on the lateral flank, with no evidence of ulceration or penetration of the overlying skin. Haematology revealed a mild anaemia (Hb 100g/L; reference range 121–151), low PCV (26 percent; reference range 33–41) and hyperfibrinogenemia (7 g/L; reference range 2–4). Aspirated contents of the abscess produced a heavy growth of \emph{Rhodococcus equi} on aerobic culture. The organism was sensitive to amoxicillin/clavulanate, streptomycin, tetracycline, trimethoprim and gentamicin, and resistant to penicillin and enrofloxacin.

New Zealand Veterinary Pathology

BOVINE

In the Waikato the manager of 250 high-producing Jersey cows suddenly changed their diet. After morning milking instead of grazing their customary diet of pasture dusted with lime flour the cows were put into a paddock of stubble left over from maize that had recently been harvested for silage. Three hours later six were recumbent with clinical signs typical of milk fever. Blood samples were taken by the attending veterinarian before initiating treatment with calcium borogluconate. The serum calcium concentration of five cows was 0.76–1.06 mmol/L (reference range 2–2.6). The serum phosphate concentration was 0.48–0.71 mmol/L (reference range 1.1–2.8). Four of the five cows also displayed acidosis. The serum bicarbonate concentration was 18.4–23.7 mmol/L (reference range 26–34). Four cows also appeared to be developing haemoconcentration because the serum albumin concentration was towards the top of the normal range. The biochemistry results demonstrate the cows had severe \emph{hypocalcaemia} and \emph{hypophosphataemia}, in some cases complicated by \emph{acidosis}. The veterinarian reported that the cows responded to treatment, albeit slowly, and all were standing by the next day. The rest of the mob had immediately been moved off the maize stubble on to grass pasture and no more cows went down. We hypothesise that the sudden change of diet from pasture supplemented with lime flour to maize stubble resulted in acute calcium deficiency and the soluble carbohydrate in the maize caused rumen acidosis. Nevertheless rumen acidosis is usually accompanied by mild hypocalcaemia.

Five days after a mob of adult dairy cows in the Waikato began grazing turnips, three older animals had developed signs of photosensitivity and their milk production had decreased. \emph{Pithomyces chartarum} spore counts were reported to be low. Serum was submitted to the laboratory for biochemistry. The GGT activities of two cows were 360 and 447 IU/L (reference range 0–36). Serum bicarbonate levels were 20 and 21 mmol/L (reference range 26–34) and anion gaps were 26 and 24 mEq/L (reference range 12–22). The moderately increased
A kiwifruit orchard in the Bay of Plenty was diagnosed with Pseudomonas syringae pv. actinidiae infection. The kiwifruit vines and supporting structures were removed from the ground, piled up and burnt. Later, 130 six-month-old Hereford x Friesian heifers grazed in the orchard. When the attending veterinarian first visited two heifers were dead, two were moribund and six were sick. One of the six had bloody faeces. The differential diagnosis list included salmonellosis, yersiniosis and coccidiosis but faecal samples from two animals yielded negative results for Salmonella sp., Yersinia sp. and coccidian oocysts. The sick animals died within 48 hours, with clinical signs suggestive of circulatory collapse. In addition all affected calves had inflammation of the muzzle, with excoriation and crusting. Specimens from all affected calves were submitted to the laboratory and the calcium concentration was 0.95 mmol/L (reference range 2–2.6), confirming the clinical diagnosis of hypocalcaemia. A vet in Marlborough was called to examine a recumbent four-year-old lactating Jersey cow. The cow had clinical signs resembling milk fever and her body temperature was subnormal (36.5°C). The herd was being milked once per day and was grazing a crop of turnips. The farmer reported there had been five similar cases in the previous few weeks and that the cows had responded to treatment with calcium borogluconate. The cows were in the eighth month of lactation, which is an unusual time to experience hypocalcaemia. Serum from the recumbent cow was submitted to the laboratory and the calcium concentration was 0.95 mmol/L (reference range 2–2.6), which confirmed the clinical diagnosis of hypocalcaemia. Serum GGT is consistent with turnip toxicosis and the cows also had mild rumen acidosis. The presumed toxic agent associated with grazing turnips has not yet been determined.

A mob of rising two-year-old beef steers in the Auckland region displayed low growth rates, low body condition scores and diarrhoea. Serum samples were submitted for measurement of serum pepsinogen activity, copper and selenium concentration, and for fluke ELISA and BVD antigen testing. Faeces were submitted for faecal egg counting. The only abnormality was that three of the five animals returned a positive result for BVD antigen, indicating that they were either transiently or persistently infected with BVD virus. A further test at least 28 days later is necessary to differentiate between transient or persistent infection with this virus. In Taranaki two adult dairy cows in a herd of 750 developed very malodorous diarrhoea and became cachectic without pyrexia. Despite parenteral treatment with tetracycline for five days they showed no clinical improvement. Salmonella Emek was isolated from a faecal specimen, confirming a diagnosis of enteric salmonellosis. In the Tasman region a calf became recumbent and developed opisthotonus, muscle tremor and extensor rigidity. The calf had had access to burnt rubbish and a presumptive diagnosis of lead poisoning was considered. A post-mortem examination was conducted. The only gross finding was the classic “Morocco leather” lesion of the abomasum. Fixed tissues were submitted to the laboratory. Histologic examination of the abomasum found nodular hyperplasia of the
mucosa, with many intramucosal nematode parasites. In the cerebrum there was patchy laminar vacuolation of the cortex and corresponding neuronal necrosis. The microscopic findings confirmed ostertagiosis and polioencephalomalacia. Meanwhile a second calf that had not had access to the burnt rubbish developed similar signs. It was promptly treated with injectable thiamine and the clinical signs abated.

A three-month-old Simmental calf in the Wairarapa presented with clinical signs suggestive of BVD/mucosal disease. The calf had diarrhoea, erosions of the gingiva, palate and muzzle, and was lame. Interestingly the owner reported that the dam had previously had three sickly calves. The dam and the calf were both positive for BVD antigen by serum ELISA. The positive test results are consistent with the dam being persistently infected with BVD virus, and the calf also being persistently infected and developing mucosal disease. To confirm this, further positive test results would need to be obtained from serum taken at least 28 days after the first sample.

In the Waikato 122 adult lactating Jersey cows were administered a zinc-containing intraruminal device for the prevention of facial eczema. Two days later three cows were recumbent in the paddock before afternoon milking. The affected cows displayed clinical signs consistent with milk fever and responded to treatment with calcium borogluconate. Serum samples from the three affected cows and four herdmates were submitted to the laboratory. The serum zinc concentration of the affected cows was 46, 50 and 99 µmol/L, whereas in the unaffected herdmates it was 22, 22, 24 and 28 µmol/L (reference range 11–20; therapeutic range up to 35). The clinical and laboratory findings were suggestive of hypocalcaemia associated with acute increase in serum zinc concentration.

**SHEEP**

In Marlborough eight four-month-old lambs were found dead. The owner suspected they might have been attacked by a roaming dog. One further lamb was found recumbent and it displayed opisthotonus and nystagmus. The lamb was euthanased and a post-mortem examination was conducted by the attending veterinarian. A full range of tissues were sent to the laboratory. The significant gross finding was in the brainstem. There was bilaterally symmetrical discolouration and malacia in the ventral bulbs of the corpus quadrigemina. Microscopically the affected region of brainstem displayed rarefaction and vacuolation of the neuropil, scattered haemorrhages and apoptosis of glia and neurons. The lesions extended caudally to involve the cerebellar peduncles. The findings are characteristic of focal symmetrical encephalomalacia due to *Clostridium perfringens* Type D enterotoxaemia, i.e., pulpy kidney disease. Since tests for clostridial toxins are no longer commercially available in New Zealand the presence of focal symmetrical encephalomalacia is used to confirm this disease.

In the Manawatu/Wanganui region 20 aged ewes out of 1100 were found dead. A post-mortem examination was conducted on four of the dead ewes and fresh tissues were sent to the laboratory for microbiologic culture. *Salmonella Hindmarsh* was obtained from the tissues of all four, confirming the clinical diagnosis of acute salmonellosis.

Two five-month-old lambs in the Waikato died. Faeces, fixed liver and fixed kidney samples were submitted to the laboratory. The faecal egg counts were 4100 and 12 500 strongyle eggs per gram (epg) and one lamb had 50 *Nematodirus* sp. epg. Larval culture demonstrated the proportions of the parasite species were 69 percent *Haemonchus* sp., 17 percent *Trichostrongylus* sp., 10 percent *Ostertagia* (Teladorsagia) sp. and 4 percent *Cooperia* sp.. Histopathology found hepatic periacinar coagulative necrosis consistent with hypoxia due to anaemia. These findings are consistent with severe haemonchosis.

Six mixed-age Merino wethers and ewes in Marlborough died over a week. At least four more animals displayed “bottle jaw” and samples from these yielded faecal egg counts of 2600, 2600, 3200 and 4150 strongyle eggs per gram (epg). In addition, one animal had 50 *Nematodirus* sp. epg. These findings demonstrated severe gastrointestinal parasitism.

**CAPRINE**

Eight lactating adult does died among a herd of 380 dairy goats in the Waikato. A further 20 does displayed clinical signs of illness including decreased milk production and coughing. The attending veterinarian conducted a post-mortem examination and reported finding multifocal lesions in the lungs. The lesions comprised 15 mm diameter areas of consolidation that were predominantly distributed in the dorsal parenchyma. Histological examination found verminous pneumonia.
with many cross-sections of parasites consistent with *Muellerius capillaris*, and chronic interstitial pneumonia with abundant infiltrates of lymphocytes and patchy fibrinosuppurative pneumonia. While *M. capillaris* only causes mild lesions in sheep, goats tend to develop a marked tissue reaction accompanied by clinical signs.

**CERVINE**

In the Bay of Plenty a mob of deer was weaned. A fortnight later nine weaners died over a period of four days. Two moribund weaners were examined by the attending veterinarian. Blood was taken ante-mortem, and post-mortem examinations were conducted. The veterinarian reported that the animals were clinically anaemic and had red urine. Haematology and biochemistry of one demonstrated severe anaemia, lymphocytosis, tissue damage, hyperbilirubinemia and increased blood urea concentration: WBC 6.7 x10⁹/L (reference range 2–5 x 10⁹), RBC 2.2 x10¹²/L (9.7–15), Hb 35 g/L (120–180), lymphocytes 2.95 x10⁹/L (0.3–1.5), AST 3110 IU/L (68–148), GGT 157 IU/L (0–60), GLDH 189 IU/L (0–40), bilirubin 58 µmol/L (1–10), urea 22.5 mmol/L (8.1–16.9). Leptospiral serology demonstrated that both animals had a positive *L. pomona* MAT titre of 1:800 and a negative *L. hardjo* titre. Histopathology demonstrated haemoglobinuric nephrosis and hepatic centrilobular degeneration consistent with hypoxia secondary to anaemia. Warthin-Starry staining of the kidney showed there were some spiriform bacteria in the few tubules that had degenerate epithelium. These findings are diagnostic for *leptospirosis*.

**ALPACA**

An adult male alpaca in the Waikato presented with inappetence and malaise of three days’ duration. Clinical examination detected an increased respiratory rate and noisy breathing. Whole blood, a fresh blood smear and serum were submitted for haematology and biochemistry. Haematology revealed increased total white cells (110.2 x10⁹/L; reference range 8–23.3) comprising predominantly immature cells (71 x10⁹/L; reference 0), with slightly increased numbers of lymphocytes (8 x10⁹/L; reference range 1–7.6) and segmented neutrophils (18 x10⁹/L; reference range 4.2–14.9). Nucleated red cells were also present (2 x10⁹/L; reference 0). Examination of the blood smear found the predominant cell type was medium to large lymphoid cells with a small amount of blue cytoplasm. In some cells the nucleus had a nucleolus. A marked leukocytosis comprising predominantly poorly differentiated lymphoid cells is diagnostic for *acute lymphoblastic leukaemia*.

**EQUINE**

A 14-year-old Thoroughbred mare in the Manawatu presented with enlarged submandibular and prescapular lymph nodes, and pleural effusion. The pleural fluid had a protein concentration of 38 g/L (reference range 0–25) and contained abnormally high numbers of nucleated cells (10.6 x10⁹/L; reference range 0–5). Cytological examination of smears prepared from aspirates of the lymph nodes and a cytospin preparation of the pleural fluid found that the predominant cell population was large immature neoplastic lymphoid cells with multiple nucleoli and frequent mitoses. The findings were diagnostic for *lymphosarcoma*. Multicentric lymphosarcoma is the most common form of the disease in horses. The lymphadenopathy is often regional, affecting a cluster of nearby lymph nodes. Typically the disease is aggressive and affected horses only survive a short time from the appearance of clinical signs.

A five-month-old pony in the Wellington region presented with diarrhea and lethargy of five days duration. A faecal egg count demonstrated 950 ascarid eggs per gram, consistent with a heavy burden of *Parascaris equorum*.

A three-week-old Warmblood foal in Auckland developed watery diarrhoea. Faecal testing demonstrated the presence of *rotavirus* and low numbers of *cryptosporidia*, indicating a dual infection.

**AVIAN**

A 25-year-old female parrot in Auckland presented with weight loss and diarrhoea of two weeks duration. The parrot had continued to eat throughout the period of illness. A faecal sample was submitted to the laboratory for testing. Parasite eggs or oocysts were not present but *Salmonella Typhimurium* was isolated by enrichment culture.

**FELINE AND CANINE**

A recently weaned two-month-old oriental kitten was mistakenly fed uncooked chicken by its new owner the day after it arrived in its new home in Southland. The following day the kitten developed mucoid diarrhoea that it passed every 30 minutes for three days until
it was presented to a veterinarian. A faecal sample was sent to the laboratory and a moderate growth of *Campylobacter* sp. and a scant growth of *Salmonella Typhimurium* were obtained. This case demonstrates that kittens are susceptible to *food-borne illness* caused by improperly prepared poultry.

A four-year-old male Rottweiler was presented to a clinic in Wellington with jaundice and signs of renal disease. The dog had no known access to toxins, had not been vaccinated against leptospirosis and was reported only to travel rarely outside urban Wellington. Serum biochemistry abnormalities included increased AST (120 IU/L; reference range 0–79), ALP 1018 IU/L (0–185), ALT 269 IU/L (0–75), bilirubin 255 µmol/L (0–6), urea 32.9 mmol/L (2.6–10.2), creatinine 245 µmol/L (45–135) and phosphate 4.44 mmol/L(1–3). These findings indicate cholestatic liver disease and azotaemia. Haematologic abnormalities were increased HCT (0.61 L/L; reference range 0.37–0.55) consistent with dehydration, and mildly increased numbers of segmented neutrophils (17.7 x10⁹/L; reference range 3–11.5 x10⁹). Because the clinical and laboratory findings were suggestive of leptospirosis a *Leptospira interrogans* serovar *Copenhageni* MAT test was conducted and gave a positive titre of 1:800. This diagnosis of *leptospirosis* is notable because the incidence of canine leptospirosis in urban Wellington is low.

**REFERENCES**
