

# Quarterly review of diagnostic cases – January to March 2003

## Gribbles Veterinary Pathology

### Cattle

Two cases of **fluoroacetate (1080) poisoning** were investigated. In the first case, one 18-month-old bull and two 18-month-old heifers were found dead. The 1080 concentration of heart muscle was >1 mg/kg, confirming intoxication. In the second case, a two-year-old bull was noticed lethargic, trembling and ataxic before collapsing and dying. One other bull in the mob of 30 was also affected. Skeletal muscle 1080 concentration was 0.02 mg/kg, confirming toxicity.

Cases of **photosensitivity in cattle grazing turnips** have been reported this summer. Glutamate dehydrogenase (GLDH) and gamma glutaryl transferase (GGT) concentrations are increased in affected cattle indicating liver and biliary damage. Brassica and turnip crops under stress (such as during drought) produce glucosinolates. When cells containing these compounds are broken open by rumination they react with rumen enzymes, which cleave the connection between the glucose molecule and the sinolates resulting in a toxic compound. The glucosinolate family is complex and the exact mechanisms and pathogenesis of the toxicity are currently unknown. Managing turnip crops as if they are toxic, similar to managing crops or grass with excess nitrate, may help avoid photosensitivity. Drought conditions in the southern North Island this summer led to poor growth and stressed turnip crops. In one case photosensitivity of the udder and white areas occurred four days after introducing cattle to the turnip crop. Most of the mob were affected and one cow died. In another case, six of a mob of 600 were affected. GLDH concentrations ranged from 196-1419 IU/l (normal 8-41) and GGT concentrations from 275-1430 IU/l (normal 9-39).

A two-year-old Friesian heifer had a 'snotty' nose but a normal temperature. Her IBR SNT increased from <1:1 to 1:192 over ten days, a more than four-fold rise in titre, confirming **acute IBR** infection. A week earlier, another cow from the same age group had shown similar signs with pyrexia. This group had not been vaccinated but in previous years all heifers on the farm had been vaccinated against IBR, BVD and PI3 in June or July.

A yearling Friesian heifer had skin lesions over its body. When the crusts were removed there were waxy lesions beneath. Histology revealed orthokeratotic hyperkeratosis and superficial pyoderma consistent with *Dermatophilus* infection. Factors that predispose to **dermatophilosis** include damp conditions, skin damage and jetting with high pressure water.

**Pneumonia** was a significant problem in several herds. In one outbreak in a herd of 450 cows the problem had started about six weeks previously and there had been no response to treatment with

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

antibiotics or anti-inflammatories. Over this time about ten home-bred heifers were affected and four died. Heifers brought in before calving were unaffected. Necropsy showed severe interstitial emphysema and patchy consolidation especially in cranial areas of the lungs. Histology revealed abomasal ostertagiasis, and severe **verminous pneumonia** with massive numbers of lungworm larvae. Lungworm infestation of this severity is unusual in this age group. Possibly the affected group of home-bred heifers had not previously been exposed to lungworm so immunity had not developed.

**Selenium deficiency** in calves was prevalent especially towards the end of the quarter. Where a history was available it usually described scouring and weight loss, and sometimes respiratory disease or dry coats. In several cases, serum selenium concentrations were extremely low, for example in five of six samples from unthrifty nine-month-old calves, serum selenium concentrations were so low they were undetectable.

This quarter, severe **cholestatic liver disease** was diagnosed in many cases by clinical pathology. The presenting signs included jaundice, photosensitisation or encephalopathy or combinations of these. For example, one cow showed erratic aggressive behaviour and had oedematous swelling of legs and abdomen; another was 'tetchy' and had inflamed teats and udder; another was ataxic with slight jaundice and raised areas of white skin. Possible causes include bacterial cholangiohepatitis, or turnip or ragwort toxicity.

Twenty-five of 600 cows developed signs consistent with **nitrate poisoning** after being let into fields that had been dusted with urea a few days before. There had been no rain in the interim. All affected cows recovered with methylene blue treatment. Pasture samples from four fields tested a week after the incident showed a mean nitrate of 9.4 g/kg DM, which is well into the toxic range. Further pasture tests showed that the pasture nitrate concentration subsequently declined rapidly.

### Deer

Fawn deaths were a relatively common problem this quarter. In some cases '**wallow deaths**' were suspected. Affected fawns were two to three weeks of age and where caecal histology was carried out it revealed suppurative typhlitis. Sometimes large numbers of fawns were affected. Six fawns from 12 hinds died in one case, and 25% of fawns in another. It appears that acute suppurative typhlitis in

fawns is associated with the drinking of water from wallows that are contaminated by faeces. In other cases, in fawns one to six weeks old, the problem seemed to be caused by **cryptosporidiosis**. There were large numbers of cryptosporidial oocysts in faeces.

In an outbreak of acute **parapoxvirus** infection in a large group of stags that had been velveted less than a month before, the main presenting sign was variable degrees of swelling of the head in about 12 mixed age stags. They also had many small scabs over their face and ears and on the regrowth velvet. Diagnosis was by histology. Although this condition had not been seen before in deer on this farm it was endemic in sheep on the same farm.

Serum samples were submitted from three normal stags for **cervine herpesvirus** SNT assays as part of the requirements of an Artificial Insemination centre. In one, the titre was  $\geq 1:1024$  and in the others 1:256 and 1:192. The estimated prevalence of this virus in New Zealand deer is around 40% and, while it has been associated with an outbreak of ocular disease in deer in Scotland, associated clinical disease has not been reported here.

A stag with a trophy head was tranquillised for removal of ear tags and assessment of its velvet. When the animal recovered it appeared to have trouble holding its head up, and over the next few hours its neck muscles appeared to become progressively weaker until it developed a snoring dyspnoea, collapsed and died. This type of problem has been associated with stags with large velvet antlers and it has been suggested that they have relatively **weak neck muscles**, which are unable to support the weight of the antlers if they are anaesthetised or tranquillised. It appears that as the rut approaches and testosterone concentrations rise the strength in the muscles returns.

There are no reference ranges for serum selenium in deer but in one recent case of fawns with a history of 'staring coats' on a new deer farm in Central Otago, serum selenium concentrations in two of four samples tested were so low they were undetectable. Concentrations in the other two were 57 and 92 nmol/l. Compared with other species, these are in the 'deficient' range, suggesting **selenium deficiency**. Serum coppers were adequate.

## Sheep

**Salmonellosis** caused ewe deaths in several cases. In one, a ewe from a vaccinated flock went down and died with a 'typical *Salmonella* smell' and necropsy findings were typical of enteric salmonellosis. *Salmonella* Typhimurium was isolated from abomasal contents although only after incubation in enrichment culture. In another outbreak, ewes were dying suddenly within 24 hours of developing severe diarrhoea and *Salmonella* Hindmarsh was isolated from caecal contents. The same organism was isolated in another outbreak in which 12 ewes had died at the time of the investigation. Four dead sheep were found in a field of 1000 four-year-old Romney ewes grazing pasture on a rotation, spending three days in each field. At necropsy of one ewe, mucous

membranes were congested and the large and small intestines were reddened to purple. Culture of large intestine grew *Salmonella* Hindmarsh. Salmonellosis is a common cause of death in sheep in summer and Hindmarsh is the most common isolate.

A ram showed green discolouration of wool at skin level on the midline and 'drip-lines' on the hindquarters and flank.

*Pseudomonas aeruginosa* was isolated from a wool sample. This organism is a recognised cause of green or brown banding of wool, and dermatitis.

**Gastroenteric parasitism** was relatively common this quarter in lambs or hoggets. In some cases the samples were submitted for routine tests with no indication that there was a clinical problem. In others, there was a history of illthrift, scouring and deaths, as in a case in which about 5% of lambs had died. A worm count on one lamb showed heavy worm burdens (nearly 20,000 *Ostertagia* and 50,000 trichostrongyles). The mixed population suggested that drench resistance was not as likely to have been a factor as insufficient drenching or poor drenching technique.

**Polioencephalomalacia** is relatively common at this time of year and predisposing factors in cases diagnosed in ewes and hoggets were a change in feed quality, generally from poor to lush, or yarding for 24 to 48 hours, or water deprivation, or a high intake of sulphur.

**Faulty administration of drench capsules** still occasionally causes deaths in sheep as a result of severe pharyngeal lesions. In one case, necropsy of a recently purchased seven-month-old ram lamb that was found dead showed a drench bolus in a pouch-like sac 5 cm x 2 cm above the entrance to the oesophagus. The carcass showed evidence of severe septicaemia. The right pleural cavity was filled with fluid pus and the lung had collapsed. It was estimated that the bolus had been present for a few weeks. This case again emphasises the need for proper administration of drench boluses.

## Goats

An unusual neurological disease was diagnosed in a 14-month-old male Boer goat. It had had hind limb ataxia for three weeks then became recumbent, developed convulsions and was euthanased. Necropsy showed excessive dorsal angulation at C2-C3 and possible stenosis of the vertebral canal. Histology revealed severe focal spinal cord malacia most obvious at the level of the stenosis and becoming progressively less towards the lumbar cord. The findings were consistent with spinal cord compression or **cervical stenotic myelopathy** caused by mal-articulation or fracture of C1/C2. Congenital vertebral malformation of this type has been reported in horses, dogs and rams.

## Pigs

Three of a litter of 11 four-week-old piglets died suddenly over a few days. Histological examination of tissues from one showed pulmonary and cardiac oedema, mild centrilobular hepatic lipidosis and a general lack of erythrocytes in blood vessels,

compatible with **iron deficiency anaemia**. Mineral supplementation had not been provided.

## Horses

**Salmonella Brandenburg** enteritis caused severe diarrhoea and deaths in foals on several stud farms. In one outbreak, there was severe diarrhoea in 'an excessive number' of foals. A faecal egg count showed large numbers of *Strongyloides* eggs, which would have also contributed to the diarrhoea. Affected foals ranged in age from three to eight weeks; they had greenish-yellow fluid faeces and treatment had little effect.

**Gastroenteric parasitism** was diagnosed in several cases. In a four-week-old scouring foal, there were 6,400 *Strongyloides* eggs/g faeces (epg). Cyathostomiasis and gastroenteric parasitism were recorded in a pony, no history provided, in which there were 900 strongyle epg and cyathostome larvae. A high faecal egg count (900 epg) was recorded (but no cyathostome larvae) in a four-year-old thoroughbred that had 'cow-like' faeces.

## Dogs

A nine-year-old spaniel became stiff, unable to swallow and febrile. A grass seed had been removed from a foot recently and the owner was unable to give the antibiotics prescribed. The clinical picture suggested **tetanus**. This disease, usually the localised form, is occasionally seen in dogs in this area, and affected dogs usually respond readily, if slowly, to treatment.

Two dogs on the same property showed weight loss, reluctance to move, lethargy, and were presented to a veterinary practitioner. Both showed a marked hypercalcaemia (up to 5.47 mmol/l). In one, the cholecalciferol concentration measured was > 160 nmol/l (normal 25-100 nmol/l) confirming **cholecalciferol toxicity**. There was no known access to the toxin. One dog recovered quickly with diuresis, the other improved but after two weeks was still hypercalcaemic, although less so than previously (3.34 mmol/l).

## Cats

Blood was received from three healthy eight-month-old cats. They lived in a multi-cat household and six months previously had been in contact with a three-year-old cat that had had a severe non-regenerative anaemia and leukaemia and was subsequently found to be FeLV-positive. Two of the younger kittens were also FeLV-positive. **Feline leukaemia** is rarely diagnosed in New Zealand, but because it is very infectious following close contact it is not surprising to see it in cats that are in close contact, sharing food bowls and grooming each other.

An 11-month-old female cat that had never been observed in oestrus was presented for routine ovariohysterectomy. Several

intra-abdominal masses could be palpated. Laparotomy revealed normal ovaries and uterus, but several masses adjacent to one uterine horn. Histopathological examination revealed that these were cystic structures filled with keratin and lined by stratified squamous epithelium. In one section, hair follicles and adnexa were present. These masses of normal tissue (in this case of dermal origin) in an abnormal location are known as **choristomas**.

## Birds

A number of juvenile **pheasants** reared on a commercial game farm became thin and died. Necropsy of one showed severe emaciation and very fluid intestinal contents. Smears of the intestinal lining and contents demonstrated massive numbers of coccidial oocysts. **Coccidiosis**, caused by a pheasant-specific species, is common in pheasant rearing establishments overseas where it can cause heavy mortality.

In native birds that died in a wildlife park, diagnoses included **caseated granulomatous air sacculitis** probably caused by *Aspergillus* species and resulting in wasting and death in a **yellow-crowned parakeet**, and starvation/exposure in a three-week-old **takahe** chick that had been accidentally separated from its takahe foster parents.

Faecal swabs from three **Brown Teal ducks** were routinely cultured. *Campylobacter jejuni* was isolated from two. This organism is commonly found in avian intestinal tracts, but the results were of interest as samples are rarely received from this species.

## Other

Blood was received from an **American bison** that had a two-month history of weight loss, a tongue laceration, was scouring and had a heavy tick infestation. It had been drenched with pour-on ectoparasiticide two days previously. Serum biochemistry revealed a hypoalbuminaemia consistent with a protein-losing enteropathy, but no other significant findings. Haematology revealed a pancytopenia comprising a lymphopaenia and neutropaenia. There was also a severe non-regenerative anaemia. The bison was negative for BVD (antigen and antibody), John's disease, liver fluke serology and malignant catarrhal fever. The animal died soon after the veterinary visit but no postmortem was performed.

A male **African wild hunting dog** died at a local zoological park and fight wounds were noted at necropsy. Females had been introduced to an all male group relatively recently and two bitches had just come into season. Histopathology revealed an acute embolic bacterial pneumonia, consistent with a **septicaemia**.

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## Alpha Scientific Ltd

### Cattle

Two amorphous tissue biopsies from a large mass surrounding the lower incisors of an 18-month-old crossbred Shorthorn steer were submitted for histological examination as the lesion had not responded to antibiotic therapy. Histologically the mass was diagnosed as a superficially ulcerated and secondarily inflamed mandibular ameloblastic fibroma. Fragments of necrotic bone present suggested mandibular bone invasion and destruction. Although **odontogenic tumour** is rare in all domestic animal species, ameloblastic fibromas are the most common type in cattle. They tend to affect young animals and usually present as mass-like lesions, which can cause loosening or loss of teeth and interfere with mastication.

### Deer

A mass associated with the base of an antler was submitted for histological examination, which revealed sheets of neoplastic lymphocytes with eccentric dark rounded nuclei and a small amount of basophilic cytoplasm. Mitotic activity was high, averaging four per high power field. There were numerous individual scattered necrotic cells and extensive areas of necrosis with serofibrinous exudation. In the vicinity of these areas, lymphatics and venules contained fibrin thrombi. The findings confirmed **lymphoma**, with associated inflammation, in this unusual location.

### Goats

The main histological findings from tissues submitted from a dead two-year-old Saanen goat were an acute periacinar hepatic necrosis, suggestive of hypoxia. Liver copper concentrations were 3700 µmol/kg (reference range <3000 µmol/kg), which in association with the histologic changes would be consistent with **copper toxicity**. Further investigation of the herd history revealed that the animals had been treated with high levels of copper sulfate per os. Two further deaths occurred in the three weeks following this one, with similar findings.

### Horses

A yearling thoroughbred filly developed respiratory dyspnoea and stridor following mild exercise. No abnormalities were detected on cytology of bronchoalveolar lavage fluids. An endotracheal tube could not be passed through the right nasal passage so a trephine biopsy was taken through the right lateral maxillary bone at about the level of the fourth cheek tooth. Histopathological examination of the biopsy allowed a tentative diagnosis of a low-grade invasive osteosarcoma or ossifying fibroma, and a guarded prognosis. The owner elected euthanasia and the entire head was submitted to the laboratory. The only external pathology noted was a soft tissue swelling over the right facial maxillary crest, which was attributed to the surgical procedure, and multiple wartlike lesions at the lip commissures. Transverse sections of the head at the levels of the first, second and fourth cheek teeth and 1 cm caudal to the last

cheek tooth revealed a smoothly contoured 7 cm diameter intranasal mass arising from the right maxillary bone. It was widest at the level of the fourth cheek tooth where it effaced and compressed the ventral ethmoid scroll, reducing it to a thin bony rim along the circumference of the mass. The dorsal nasal passage at this level was compressed to a slit-like aperture and the nasal septum mildly deviated. On section the mass was firm and flesh-coloured with multiple small gritty ossified spicules. Histology confirmed the labial masses as papillomas, and the intranasal mass as a **neoplastic ossifying fibroma**. Ossifying fibromas are expansile lesions arising from either the maxilla or mandibles. They tend to cause loosening or loss of teeth and interfere with mastication. The mass in this horse was unusual in that it extended into the nasal cavity causing distortion of the ethmoid bone as opposed to the more usual involvement of the alveolar maxillary bone.

The left ovary of a mare of unspecified age and breed was submitted for histology to verify or exclude ovarian neoplasia. Grossly the ovary was greatly enlarged, 8 x 6 x 4 cm, mottled yellow-white and red, and polycystic with fibrous streaks and bands and multiple and extensive necrohaemorrhagic areas. Histologically the mass was diagnosed as a benign expansile **granulosa cell tumour** confined within the ovarian capsule. This is the most common ovarian tumour of mares, in which it is almost invariably benign and metastasis rare. The condition can often be suspected clinically as it is commonly associated with changes in sexual behaviour, in particular androgenic traits and nymphomania, but these tend to disappear within months of surgical removal of the neoplastic ovary.

### Pigs

Diarrhoea and occasional deaths were investigated in a backyard piggery. One or two piglets had been affected in each litter from six farrowings over a two-week period. In the most recent litter, all piglets had diarrhoea and loss of appetite and condition after weaning. Faecal egg counts revealed significant **Trichuris worm burdens**, 5500 egg in one pig examined.

### Dogs

A seven-year-old spayed terrier bitch developed acute onset bloody diarrhoea and vomiting. Biochemistry, haematology and a faecal egg count were all unremarkable. However, culture of faeces resulted in the isolation of *Salmonella* Brandenburg. The dog was known to have eaten dead birds. This laboratory sees cases of enteritis in various species, from which **Salmonella Brandenburg** is occasionally isolated, although it has not been associated with ovine abortion in the North Island.

### Cats

**Feline panleukopaemia** still occurs as a clinical entity, with three cases diagnosed in the last few months. All cases were kittens, from different parts of the country, and were diagnosed histologically with severe necrotising enteritis.

An eight-month-old female domestic longhaired cat developed multiple abdominal subcutaneous masses in the ventral abdomen. Histologically there was a multilobular non-encapsulated mass composed of multiple proliferating ducts and ductules. This condition is a **hyperplastic/dysplastic mammary gland** condition, which usually occurs in cats less than two years of age. It tends to involve multiple glands, usually in pregnant or progestin-treated cats so is believed to be associated with excess circulating progesterone or progestins. It can cause clinical problems but tends to disappear following termination of pregnancy or after spaying or cessation of progestin therapy.

### Other

Four cases of sudden death in **rabbits** from different regions were diagnosed as **rabbit haemorrhagic disease**. All were pet rabbits of unknown vaccination status. Diagnosis was made on history, and necropsy and histological findings of hepatic swelling and necrosis together with pulmonary oedema and swollen spleen.

An **adult spider monkey** had a one- to two-month history of chronic diarrhoea, and lived in group housing. One of the in-contact older animals also had a one-year history of chronic intermittent diarrhoea. On exploratory laparotomy, a localised fibrinous peritonitis was observed in the area around the appendix. Tissue sections of the colon demonstrated a marked erosive and ulcerative colitis with numerous large 40 µm diameter single-celled organisms present within and overlying the ulcer and within the colonic crypts surrounding the ulcerated region. The single-celled organisms had strongly PAS positive inclusions. *Entamoeba histolytica* infection was suspected. Examination of rectal scrapings from the same animal revealed similar sized large round organisms. The diagnosis of *Entamoeba histolytica* was confirmed by referral of the slides overseas.

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