Surveillance Report

VLA Miscellaneous Captive Exotic and Farmed Species Expert Group

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HIGHLIGHTS

Notifiable disease

Fin Twomey and colleagues from the VLA and Animal Health agency published a joint letter on the first British case of suspected alpaca to alpaca transmission of TB associated with movement of animals to a breeding herd. This raises issues relating to biosecurity with respect to disease control measures for camelids and TB.

Zoonotic infections

An outbreak of *Campylobacter fetus fetus* infection was investigated in an alpaca herd with an abortion problem, this is considered to be the first report of such infection in the UK.

Endemic, new & emerging diseases

Since the start of 2009 *Mycoplasma haemolamae* has been isolated for the first time in the UK, from submissions from two alpacas with signs of anaemia; this is a recognised cause of anaemia in camelids.

SUBMISSION INFORMATION

Submission numbers	2007 Q1	2008 Q1	2009 Q1
All species (carcases)	315 (97)	431 (126)	436 (106)
Alpaca	126 (16)	195 (32)	227(26)
Llama	16 (2)	24 (2)	20 (3)
Deer	26 (9)	30 (11)	33 (16)

1. Notifiable Diseases

TUBERCULOSIS

From 1st January 2009 to the end of June 2009, *Mycobacterium bovis* has been isolated from 17 individual camelid submissions (all alpacas), 7 of which originated

from two herds with ongoing TB breakdowns first detected in 2008, whilst the other positive submissions came from 5 different infected alpaca premises identified this year. All the alpaca premises in question were situated in areas of high endemic bovine TB incidence. *M. microti* and *M. avium* has been isolated from single alpaca submissions.

2. Zoonotic Diseases

Abortions in alpacas due to *Campylobacter fetus fetus*

A farm visit was undertaken to investigate abortions in alpacas due to *Campylobacter fetus fetus*. During April and May 2009 there were four near term abortions and a live born premature cria which died. The abortions were from a group of 30 pregnant alpacas due to birth between March and September 2009. Two foetuses with placenta were submitted for abortion investigation and in both *Campylobacter fetus fetus* was isolated from foetal stomach content. Both of the placentae had a placentitis. Abortion due to *Campylobacter fetus fetus* has not previously been reported in camelids. Zoonoses advice was provided. Advice on the control of *Campylobacter fetus,* extrapolated from sheep, was also provided.

E. coli O157 outbreak

A visit to an open farm was undertaken to assist the Health Protection Agency with the investigation of an outbreak of 9 cases of Vero cytotoxin-producing *E. coli* O157 (VTEC O157) phagetype 21/28 which affected people who had recently visited the premises and their families. Investigations indicated that the organism detected in cases was present in cattle, sheep, horses, pigs, goats/deer (housed together), llama, donkey and pet rabbit faecal samples. For further information please see the FZ2100 Non-Statutory Zoonoses report for April-June 2009 on the VLA website.

The VLA is currently carrying out further screening of camelids for *E. coli* O157 by examining faeces samples and carcases submitted for routine diagnostic purposes.

Avian tuberculosis

Post mortem examination was performed on an ostrich which had shown a period of weight loss and failure to respond to antibiotics. Numerous granulomatous lesions were present within the gut and liver and ZN smears confirmed a diagnosis of tuberculosis, likely avian tuberculosis. The bird was one of ten birds, including ostriches, rheas and emus, kept extensively as a private zoological collection.

Yersiniosis

An eight-month-old red deer hind was one of seven of a group of fifty losing condition and scouring, four had died and *Yersinia enterocolitica* was isolated from a sample of small intestine contents.

For further information about zoonotic conditions please see the FZ2100 project summary reports on the VLA website :
http://www.defra.gov.uk/vla/reports/rep_surv_zoonoses.htm.

3. Endemic New and Emerging Diseases: South American Camelids

PARASITIC DISEASES

Intestinal parasitic disease was confirmed on eight premises at several Regional Laboratories. Nematode infections, including *Trichostrongylus axei*, *Nematodirus battus* and *Trichuris,* were diagnosed on five of these and *Eimeria macusaniensis* (coccidiosis) on the other three. Mostly adult animals were affected.

Four of the nematode infections and two of the coccidiosis cases were diagnosed at necropsy. The other two premises submitted faeces samples. Clinical signs associated with nematode parasites included soft faeces, diarrhoea, illthrift, anaemia, malaise and death, although some of these may have been ascribed to concurrent problems (see below). As well as demonstrating high parasite burdens by parasitological techniques, supportive histopathological changes were also demonstrated in two cases. Clinical signs associated with *E. macusaniensis* included soft faeces, diarrhoea, wasting and death. On two of the affected premises, animals had recently been imported from the Southern hemisphere, and post mortem examination demonstrated severe small intestinal necrosis.

This highly pathogenic effect has previously been documented in British alpacas (Schock *et al.* Coccidiosis in British alpacas (*Vicugna pacos*). Veterinary Record 2007; 160: 805-6). In one of the imported groups, faecal oocyst counts were similar (>1000 opg) in both clinically affected and unaffected animals, demonstrating the difficulty of using faecal counts as an indicator of disease. Concurrent problems in three animals with parasitic disease included fungal colonisation of necrotic enteric lesions secondary to *E. macusaniensis*, perforation of C3 with peritonitis, and tuberculosis associated with *Mycobacterium microti.*

Fluke infection was diagnosed in six alpaca and two llama submissions. These included reports from four premises by two Regional Laboratories. One alpaca which died after showing breathing difficulties and exercise intolerance had endocarditis similar to other fasciolosis cases described in previous Quarterly Reports. Concurrent problems in two animals included *Clostridium perfringens* infection and hypocupraemia.

SEPTICAEMIA AND RELATED DISEASES IN CRIAS

Septicaemia was suspected in four crias, and a specific cause was confirmed in two of these. *Streptococcus bovis* biotype 1 *(Streptococcus gallolyticus gallolyticus)* was isolated from a seven-month-old alpaca which had haemorrhages throughout the carcase. This organism has previously been recorded in alpacas (Twomey *et al*. *Streptococcus bovis* biotype I meningoencephalitis in an alpaca (*Lama pacos*) cria. Veterinary Record 2007; 160: 337-9). *Haemophilus* species was isolated from the joints of a seven-day-old cria with polyarthritis, as well as from the brain and liver. Septicaemia was also suspected in two neonates which had not ingested sufficient colostrum and had been given supplementary colostrum, milk and intravenous plasma. Both deteriorated and died despite veterinary treatment. In both there were widespread haemorrhages, and one had peritonitis, pleurisy, pneumonia, and numerous miliary abscesses along the ventral edges of the lung lobes. The latter lesions were more likely caused by inhalation rather than sepsis, as determined by

histopathological examination. No significant bacteria could be isolated from both crias, probably reflecting antibiotic treatment.

Starvation / mismothering was the suspected cause of death in a five-day-old cria, which was in poor body condition and only had a small quantity of undigested grass in the stomach.

NEOPLASIA

A five-year-old alpaca was submitted following colic of 24 hours duration before death. Extensive peritonitis originating from a perforated duodenal ulcer was identified at necropsy. Histopathology of the area surrounding the ulcer revealed an anaplastic neoplasm, which presumably predisposed to ulceration.

CONGENITAL PROBLEMS

A cria died at three days of age having shown respiratory difficulties from birth. A membranous barrier was present between the pharynx and nasal cavity, confirming a diagnosis of choanal atresia. This is a common congenital defect of camelids.

SKIN DISEASE

Sarcoptes mites were identified from alpacas with typical mange skin lesions that had not responded to treatment.

Staphylococcus aureus was isolated from large abscesses over the left shoulder and ventral abdomen of an adult alpaca.

MISCELLANEOUS

Gastric ulcers were diagnosed twice. The first was a recently imported alpaca in which all three stomach compartments were affected. Incidentally, coccidiosis was subsequently confirmed in cohorts, mentioned above. The second was an adult alpaca which had malaise of less than 24 hours duration. Peritonitis was associated with a perforated C3 compartment. This animal also had a significant infestation with *Trichostrongylus axei* and *Nematodirus battus*, also mentioned above.

A perforated jejunal ulcer was the suspected source of peritonitis, with adhesions between segments of small intestine, in an 11-month-old alpaca which had been ill-thrifty for several weeks. Two days prior to death it had separated from its cohorts, was reluctant to feed and appeared ‘tucked up’ in the abdomen. It deteriorated to recumbency and died in spite of veterinary treatment.

A two-year-old male alpaca died after a short illness. *Clostridium perfringens* infection was diagnosed by demonstration of alpha toxin in small intestinal contents. Fasciolosis was also diagnosed, mentioned above.

Fungal organisms were associated with necrotic intestinal lesions on histopathology, which were probably secondary to *Eimeria macusaniensis*, discussed above.

An eighteen-month-old alpaca had hind limb ataxia, particularly affecting the right side, and was reluctant to stand or walk. At necropsy there was inflammation and necrosis in soft tissues surrounding the right hip, wear to the intracapsular ligament and free cartilage within the joint. This reaction communicated with an abscess in the right inguinum which had resulted in peritonitis. Additional findings included: severe periodontal disease with abscessation of a mandibular molar tooth root and sinus tracts to the tongue and sub-mandibular tissue; two mouth ulcers covered with diphtheritic membranes; diffuse ulceration of the oesophagus; and moderate lung and pleural oedema. No bacteria were isolated, presumably a result of antibiotic treatment; however histopathology was suggestive of septicaemia. The exact pathogenesis of disease was uncertain but it is possible that a foreign body or penetrating injury caused the abscess which subsequently spread to the hip area and peritoneum.

A male adult alpaca was markedly lame on his right front leg. Clinical examination revealed severe pain in the shoulder joint with crepitation. After approximately six weeks with no recovery, the animal was euthanased on welfare grounds. Post mortem examination revealed marked lytic changes to the head of the humerus. Although the cause could not be identified, one possibility was dislocation of the shoulder joint with subsequent wear due to abnormal rubbing of the articular surfaces.

Hypocupraemia and hypoalbuminaemia were demonstrated in a 12-year-old llama with weight loss and poor appetite. The significance of low blood copper was unclear given that patent liver fluke infection was also demonstrated (see above). Hypocupraemia was also seen in a yearling llama with sporadic hind limb ataxia, as well as in several of its cohorts. Enzootic ataxia is a comparable syndrome in other species, although this disease has not been diagnosed in South American camelids**.**

Mycoplasma haemolamae was identified by analysis of 16S ribosomal DNA from PCR amplicons using Denaturing Gradient Gel Electrophoresis (PCR/DGGE which enables rapid identification of various mycoplasma species) in an anaemic alpaca.

4. Endemic New and Emerging Disease - Zoological Collections

Ungulates

A 6-day-old Sitatunga (*Tragelaphus spekii*) calf was submitted for post mortem examination having been found dead. The gross post mortem findings were scant content in the intestinal tract with an absence of milk clot in the abomasum. The left elbow joint contained slightly turbid joint fluid. Bacterial culture undertaken from lung, liver and joint fluid gave growth of non haemolytic *E. coli*. A ZST estimation undertaken on the blood sample collected at post mortem gave a result of 6 units which is low based on extrapolation from the level giving adequate protection in cattle (20 units). A diagnosis of hypogammaglobulinaemia (failure of adequate colostrum transfer) was made.

Tissues sampled from a captive Babirusa pig (*Babyrousa celebensis*) produced growths of *Pasteurella multocida* from heart blood swabs indicating a diagnosis of pasteurellosis. The animal had been found dead, however, the remaining three

animals in the enclosure were unaffected. Findings of the post mortem examination carried out by the submitting veterinary surgeon included pneumonia and septicaemia.

Hyraxes

The carcase of a rock hyrax (*Procavia capensis)* which had been euthanased was submitted for post mortem examination. The significant finding at post mortem examination was of a pale colour to the kidney cortex. Urea estimation undertaken on thoracic fluid showed a level of 52.4 mmol/l. Histopathological examination of the kidneys showed a chronic tubulo-interstitial nephritis with loss of tubules and fibrosis. There was also evidence of acute to subacute nephrosis with crystal formation which had a morphology suggestive of oxalate crystals. Oxalate containing plants may result in tubular necrosis in ruminants. Whether this animal had a low level exposure to a nephrotoxin over a prolonged period or had pre-existing renal disease with a one-off toxic incident could not be differentiated.

Macropods

An aged red-necked wallaby (*Macropus rufogriseus*) had been anaesthetised in order to flush an abscess from an alpaca bite on its back. The animal recovered from its anaesthetic but was later found dead. Skin wounds were present on the dorsal midline and there was extensive subcutaneous tracking of thick green purulent and necrotic material extending from the level of the scapula to the left infra-spinatous muscle. *Fusobacterium* species were isolated from the necrotising myositis and fasciitis but it was not possible to confirm whether death was associated with this pathology and/or the effect of anaesthesia. *Fusobacterium* infections (necrobacillosis) are particularly common in macropods as indicated in previous quarterly reports; infection may enter through any traumatic injury with subsequent faecal contamination of the wound.

Birds

Aspergillosis was confirmed in two birds from local zoological collections. An adult Plush Crested Jay (*Cyanocorax chrysops*) was presented after dying following a period of respiratory distress which failed to respond to treatment. On post mortem examination, approximately 90% of the lungs were replaced by up to 10mm diameter creamy white circular firm masses. No acid-fast bacteria were detected, but a light pure growth of *A. fumigatus* was isolated from a lung granuloma. In the second case, a two-month-old Spreo starling (*Lamprotomis superbus*) was presented having died after a period of condition loss. *A. fumigatus* was isolated from a 10 mm diameter creamy-green plaque in the retroperitoneum adjoining the caudal border of the left lung. The thoracic and abdominal air sacs also were markedly thickened with caseous material on the surfaces.

Two cases of “gapes” were seen in birds submitted from a local zoological collection. A four-week-old Von der Deckens hornbill (*Tockus deckeni*) had numerous gapeworm (*Syngamus trachea*) and blood clots in the trachea. Similarly, a four-week-old Bali starling (*Leucopsar rothschildi*) had a heavy *Syngamus trachea*

infestation. *Capillaria* eggs were also detected in the intestine content of both these birds.

5. Endemic New and Emerging Disease – Bison & Reindeer

Bison

A 4½-year adult bison was the second to have died from a period of chronic weight loss. This was attributed to trace element deficiency and fluke infestation given that liver copper and selenium levels were below detection threshold and fluke eggs were detected in the faeces.

Reindeer

A one-year old male reindeer was submitted for post mortem examination. It was one of two animals purchased in November 2008 and in February 2009 had become recumbent and died despite treatment. Both reindeer had been fed at least 3 kg of concentrate, sugar beet and chelated copper. They had been housed inside all winter but had been out during the day. At post mortem the main finding was very poor body condition with gelatinous degeneration of fat. Liver copper was high suggesting over supplementation, although the post mortem findings were not typical of toxicity. It was proposed that the poor condition of this animal had resulted in weakness and the clinical signs described. Reindeer may not adapt well to the UK climate and available feed, leading to ill thrift and wasting.

Two reindeer, which died within one month of each other on the same premises, were submitted for postmortem examination. Clinical signs in both animals included acute onset inappetence, pyrexia and incoordination. Gross postmortem examination of the first animal was unremarkable; examination of the second animal revealed intense congestion and necrosis of the caecal mucosa (see figure), subepicardial petechiation and subendocardial haemorrhage. Detection of OvHV-2 DNA in samples from both animals by PCR confirmed the diagnosis of malignant catarrhal fever (MCF). The animals were kept on an open farm in close proximity to sheep and advice was given on the association of MCF with exposure to sheep.