

OVERVIEW

- Rickets and gastrocnemius tendon rupture in beef finishing bulls.
- Ureteral atresia and pulmonary hypoplasia in an aborted calf.
- Closantel toxicity in hoggs following the use of a combination drench.
- Ovine Abortion due to *Yersinia pseudotuberculosis* in two flocks

GENERAL INTRODUCTION

The mean temperature for March was equal to the long-term average. Rainfall was 88 percent of average overall, due to drier than normal conditions in the east. Sunshine was 110 percent of average, and was generally above normal in the east, the far north and the Western Isles.

DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in June 2019. Given similar climatic and production conditions, they could also be important this year.

- **Clostridial myositis and myocarditis in cattle**

Blackleg is encountered most often in young, thriving cattle at grass. The resistant spores of *Clostridium chauvoei* can be found in certain localities where they may persist for long periods in soil. Increased activity in response to turn out may predispose calves to traumatic injury and low tissue oxygen tension, with subsequent activation of latent spores within muscle tissue. The cardiac form is common and, if suspect lesions are found, histopathology can be used to confirm the diagnosis.

- **Lead poisoning in cattle**

Analysis of VIDA data shows that lead poisoning is most frequently diagnosed in June, with animals under one year of age over-represented. Common sources of lead include old engine batteries, ash from sites of vehicle fires or bonfires that have contained batteries, flaking lead-based paint, discarded engine oil, grease, putty, plumber's materials, linoleum and geochemical lead. Heparinised blood samples or kidney are the diagnostic samples of choice.

CATTLE

Nutritional and metabolic disorders

A large beef finishing unit purchased a group of 28, 15 to 21-month-old Aberdeen Angus bulls from one source. Body condition on arrival was reported to be poor and they were introduced to a ration that included beans, molasses and potatoes. Three months later they had gained between 100 and 150 kg but were showing varying degrees of gait abnormality. The most severe cases were initially stiff before progressing to hind limb knuckling then recumbency. Two animals were submitted for investigation of the problem. Multiple musculoskeletal lesions were identified including unilateral gastrocnemius tendon rupture (Fig 1), rickets and osteochondrosis involving the occipital bone of stirk one and the stifle of stirk two. Significant deficiencies of vitamin A and selenium were confirmed on analysis of liver, and the rib ash content was less than half the expected value. Bone phosphorus and magnesium content was lower than expected. The rupture of the gastrocnemius was the immediate presenting problem, however there was no evidence of underlying myopathy and this was considered to be secondary to nutritional bone abnormalities associated with dietary imbalances and lack of mineral and vitamin supplementation to rapidly growing animals. The osteochondrosis lesions were considered incidental at the time of presentation.



Figure 1 – Rupture of gastrocnemius tendon in a fattening bull

Toxic conditions

A two-week-old Limousin cross calf appeared to be thriving before becoming suddenly blind and disorientated prior to death. Small flecks of material found within the rumen content raised suspicions of lead poisoning. Kidney lead analysis returned a result of 75 mg/kg, with results above 2.07 mg/kg consistent with toxicity.

Inspection of the shed revealed old flaking plaster paint on wooden beams and samples were collected for testing. A result of 222,000 mg lead/kg confirmed the paint as the source of toxicity. The case was reported to Food Standards Scotland.

Alimentary tract disorders

A two-week-old Holstein calf was submitted as part of an ongoing investigation into diarrhoea problems in pre-weaned dairy calves. A large volume of milk was found in the rumen with numerous white plaques adherent to the mucosa (Fig 2). When these were removed, the underlying tissue was ulcerated. The abomasum was bloated and the intestinal contents were fluid. Large numbers of cryptosporidial oocysts were detected and considered significant. A yeast species was cultured from the rumen wall, and histopathology confirmed a severe rumenitis due to yeast and other fungal species. Advice was provided on reducing the risk of rumen drinking.



Figure 2 – Fungal plaques on the rumen mucosa secondary to rumen drinking

Musculo-Skeletal conditions

A ten-month old Simmental cross was euthanased in order to investigate ongoing issues with pneumonia and lameness in a shed of 330 calves. Animals with pneumonia tended to respond to treatment however those that became lame generally failed to fully recover. Four animals had died and the submitted calf had been lame for four months. An increased volume of synovial fluid, with occasional fine strands of fibrin, was found in multiple joints. The right elbow contained small amounts of purulent material and the cartilage was eroded. A small number of adhesions were present between the right cranial lung lobe, the pericardium and sternum, but there

was no evidence of bronchopneumonia. Bacterial cultures of the lung and multiple joints remained sterile proved positive. PCR analysis detected *Mycoplasma bovis* DNA in samples from the lung and the right elbow with low Ct values indicating clinical significance.

Histopathological examination confirmed chronic inflammation in the synovial membranes with variable amounts of fibrosis. Characteristic *Mycoplasma bovis* lesions were not present, however this may have been due to chronicity and antibiotic treatment. The presence of mineralised exudates associated with macrophages within the lumen of several bronchioles were suspected to be resolving *M bovis* lesions.

Renal diseases

A 260-cow dairy herd reported a problem with milk drop in a number of early to mid-lactation cows. Several cows had been examined by the referring practitioner and found to be pyrexic. A five-year-old Holstein cow, with a 72-hour history of milk drop, collapsed and died in the collecting yard. Postmortem examination revealed bilateral kidney enlargement with firm pale tissue replacing extensive areas of the parenchyma (Fig 3). Cultures remained sterile, but histopathology confirmed a severe chronic active nephritis. The lesions were too widespread to ascertain their aetiology but pyelonephritis secondary to ascending infection was thought to be the most likely explanation. The cow was 200 days in milk but not yet back in calf. It was suspected that this cow was atypical in relation to the other milk drop cases and that further investigation was warranted.



Figure 3 – Pyelonephritis in a dairy cow

A five-year-old Limousin cross cow from a group of 26 spring calvers aborted at seven months gestation. Examination of the foetus revealed severe, bilateral hydronephrosis and hydroureter due to bilateral atresia of the distal ureters which ended blindly and did not connect to the bladder. Excessive fluid was found within the

peritoneal and pleural cavities. Pleural effusion is a relatively rare complication of obstructive uropathy in other species and the pathogenesis is unclear. However, in some cases, unilateral pleural effusions have been associated with ipsilateral hydronephrosis, suggesting the pathogenesis may include fluid transfer via the retroperitoneal lymphatic system. The lungs were also markedly hypoplastic (Fig 4), most likely secondary to compression caused by the pleural effusion. Ureteral atresia is a rare congenital abnormality and the underlying basis has not been determined.



Figure 4 – Pulmonary hypoplasia in an aborted calf

SMALL RUMINANTS

Toxic conditions

A flock reported that four, ten-month-old hoggs had become blind over a three-week period and two had died. The group had been treated with a closantel/mebendazole drench and moved onto kale five days before the signs presented. Access to baled silage was maintained. Examination of an affected animal found that the pupillary light reflex and menace response were absent on both sides, but the palpebral reflex was present. There were no significant findings on postmortem examination. Histopathology of brain, eye and optic nerve identified subacute myelin vacuolation with variable axonal swelling and fragmentation in the optic nerves, optic chiasm and the periventricular white matter of the brain. The findings were typical of closantel toxicity. Further history collected retrospectively indicated that the flock had used closantel products without problems for several years, and that the dosing gun had been calibrated before use. Some hoggs were reported to be lighter than expected for the time of

year and this may have led to inadvertent overdosing. Toxicity has been reported at 1.6 times the recommended dose.¹ Overestimation of body weight is the most common factor in ovine closantel toxicity and extra care should be taken particularly when dosing groups of sheep with a wide weight range.

Reproductive tract conditions

Abortion due to *Yersinia pseudotuberculosis* was diagnosed in two different flocks. Several foetuses were submitted from each holding and *Y. pseudotuberculosis* was isolated from the foetal stomach contents of them all. Numerous fine (<1 mm diameter) white to grey foci were observed on the liver of the foetuses from one flock. Histological examination of liver and placenta described severe purulent placentitis and necrotising hepatitis with large colonies of bacteria consistent with the isolated *Yersinia* sp. Hepatic miliary abscesses can be seen in cases of listerial abortion but *Yersinia* sp. infection should be considered as a differential when these are observed.

Musculo-Skeletal conditions

Fifteen Texel cross lambs from a group of 350 became laterally recumbent and died. A typical case was submitted live and euthanased for postmortem examination. The lamb was three weeks old and had been at grass for ten days. It was unable to stand, and proprioceptive reflexes were present in the fore but not the hind legs. Examination of the limbs and atlanto-occipital joint failed to reveal any abnormalities. However, the tissues ventral to the cervical spinal cord segments 1 and 2 appeared oedematous and fibrinopurulent exudate was evident when this joint was opened (Fig 5). *Streptococcus dysgalactiae* was isolated and is the most common cause of septic arthritis in lambs. Typical cases of joint ill were not reported.



Figure 5 - Septic arthritis due to *S dysgalactiae* affecting the cervical spine

The carcase of a hog that had been found dead was submitted for postmortem examination. This revealed a 10 cm long tear in the mid diaphragm with herniation of the reticulum and part of the rumen into the thorax displacing the lungs. Free blood and clots were found in the thorax and abdomen. Twin foetuses with a combined weight of 12 kg were present in utero and the cervix was partially open indicating that parturition had commenced. It was suggested that the pressures associated with this had caused the diaphragm to rupture. Histopathology was not carried out in this case but chronic underlying damage has been reported to predispose to diaphragmatic rupture.² Investigation of any ongoing losses was recommended.

Nervous system disorders

A flock reported the birth of weak lambs that were unable to stand and suck. Two were submitted for investigation of the problem and found to have low birthweights of 2.6 and 1.9 kg. Some peri-renal brown fat was present, and their abomasae were well filled with milk as a result of stomach tubing. No evidence of border disease infection was detected, and liver copper results were within the reference range. Histopathology confirmed cerebrocortical necrosis with extensive neuronal loss and gliosis. These findings showed some similarity to lesions of necrotising encephalopathy and porencephaly most likely associated with inadequate maternal nutrition or placental insufficiency.³ Both could contribute to low birthweights but the former was considered a more likely explanation. It was advised that further investigation of the problem should include monitoring of ewe BOHB levels within 24 hours of lambing and examination of placentas.

Circulatory system disorders

A ten-week-old Valais blacknose lamb that was being artificially reared was found dead and submitted for postmortem examination. The lamb weighed 21 kg and approximately one litre of ascitic fluid was present in the abdominal cavity. The lungs were oedematous and the liver was friable. Histopathology found a multifocal, polyphasic necrotising cardiomyopathy with secondary pulmonary oedema. A nutritional cause is the most likely explanation for this lesion in a lamb of this age however liver vitamin E and selenium levels were within reference ranges. It was hypothesised that the pathology had been induced by an earlier antioxidant deficiency but that the hepatic reserves had increased by the time of death, similar to that proposed in some cases of mulberry heart disease in which hepatic selenium and Vitamin E levels are within reference range at the time of death. Sampling ewes in late gestation to check selenium and vitamin E status was advised for 2021.

PIGS

Nutritional and metabolic disorders

An outdoor sow unit experiencing increased mortality in pre-weaned piglets submitted 22 neonatal piglets for investigation of the problem. The farrowing rate was reported to be very good and no abortions, stillbirths or fertility problems were causing concern on the unit. The piglets had been born to several dams and were less than 24 hours of age. Postmortem examination found that several had external and internal trauma consistent with being crushed, and that nine had not ingested milk. Tissues from three piglets were examined histopathologically and no evidence of infectious disease was detected. Sufficient colostrum intake was confirmed in two. Starvation is likely to have predisposed the nine piglets without evidence of ingested milk to crushing by the sow. Investigation of other management factors which may increase the risk of piglets being crushed was recommended.

References:

- 1 Crilly JP, del Pozo J, Scott PR *et al.* Retinopathy and optic neuropathy following closantel treatment of ewes. *Vet Rec Case Rep* 2014;2:e000044
- 2 Waine K, Strugnell BW, Howie F *et al.* Diaphragmatic lesions and fatal haemorrhage in Texel sheep. *Vet Rec Case Rep* 2019;7:e000745
- 3 Scholes SFE, Strugnell BW, Watson PJ. Necrotising encephalopathy and porencephaly in lambs. *Vet Rec* 2009; 165: 31-2