SRUC Veterinary Services Monthly Report for May 2022

OVERVIEW

- **Lead poisoning in beef cattle at grass**
- **Blackleg post vaccination in one-month-old lambs**
- **Fatal haemonchosis in alpacas**

GENERAL INTRODUCTION

The monthly mean temperature for May was 1.1 °C above the long-term average with minimum temperatures averaging up to 2.5 °C above normal in parts of the Highlands. Rainfall was well above average in some western parts, but near or just below average in the south and east, giving 133 per cent of normal overall. Sunshine hours were 71 per cent of average and it was particularly dull towards the north-west.

DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in August 2021. Given similar climatic and production conditions, they could also be important this year.

- **Parasitic gastroenteritis in lambs**
  Fields that were grazed by ewes and lambs earlier this year may harbour high numbers of infectious worm larvae by late summer. Monitoring live weight gains and/or worm egg counts should be encouraged in order to target anthelmintic treatments effectively. Stocking lambs on grazing known to be low risk with regards to larval challenge will help maintain growth rates post weaning.

- **Heat stroke in outdoor pigs**
  A thick layer of subcutaneous fat and negligible perspiration predisposes pigs to hyperthermia. A lack of shade, obesity or black pigmentation will increase the risk. Sunburn can also occur especially in pigs that were previously managed indoors. Abortion and infertility can be consequences of heat stress.

CATTLE

Toxic conditions

Ten cows and four calves were turned out onto rented ground in early May. The second calf to die was submitted for postmortem examination and the following day the two remaining calves were reluctant to stand and appeared to be blind. One died later that day and the group were housed. The next morning the surviving calf was described as continuously circling, vocalising, and frothing at the mouth prior to death. Its dam became dyspnoeic and died around 48 hours later. Postmortem examination detected moderate pneumonia in two of the three calves and aspiration pneumonia in the cow. Aspiration pneumonia is a recognised but uncommon sequala to lead poisoning in cattle. Additional findings included liver pallor and petechial haemorrhages within the tissues of the neck and renal cortices. Lead poisoning was suspected based on the history and kidney lead levels ranging from 51.1 mg/kg fresh tissue (FT) to 109 mg/kg FT (reference range < 0.2 mg/kg FT) confirmed the diagnosis. The field was inspected, and no evidence of a battery was found. Possible sources of lead included seepage from a disused tip that had been partially covered over or run off from an adjacent premises that hired out industrial equipment. Blood samples were collected from the remaining nine cows and showed evidence of lead poisoning in four and lower-level exposure in two. Environmental investigations are being undertaken by the relevant authorities.

A second outbreak of lead poisoning was confirmed after two beef heifers from a group of eight died within a 24-hour period. The first was found dead in a ditch and the second exhibited neurological signs before death. The group had been outwintered and management had not changed. The kidney lead level was high at 46.30 mg/kg FT. The source of lead remains unknown. Food Standards Scotland was notified in both cases. Diagnoses of lead poisoning peak in May and June following turn out of cattle to grass.

Generalised and systemic conditions

A shorthorn cross calf was found dead and a second was found recumbent and dying within 24 hours of unassisted calvings. At postmortem examination both had slightly orange livers, evidence of milk in the abomasum and watery large intestinal contents. *Clostridium perfringens* was cultured from the ileum of both and small intestinal contents tested positive for epsilon toxin. Neonatal pulpy kidney was suspected and histopathology revealed epithelial degeneration of the renal cortical convoluted tubules and extensive interstitial haemorrhage typical of *C perfringens* enterotoxaemia type D in the first calf. Findings in calf two suggested septicaemia as the cause

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of death and the detection of *Escherichia coli* in pure growth from the liver supported this diagnosis. The finding of increased neutrophil production in the bone marrow suggested that infection had occurred *in utero.*

In utero infection was also suspected in two, one-day-old dairy cross calves submitted to investigate an issue with small calves that died within 24 hours of birth. Both dams had calved without assistance, and the calves weighed only 28 and 30 kg. One was reported to be four weeks premature while the other was known to be full term. The first calf was autolysed which limited testing options. Significant postmortem examination findings in the second calf included enlarged mesenteric lymph nodes, splenomegaly and petechiation of the myocardium. Heavy, pure growths of *Yersinia pseudotuberculosis* were isolated from the ileum of calf one and the lung, liver and spleen of calf two. Histopathology described a hepatitis, myocarditis, bronchointerstitial pneumonia and severe enterocolitis associated with intralesional colonies of bacilli in calf two. These findings were consistent with septicaemia with the infection originating in utero.

Alimentary tract disorders

A yearling Jersey heifer was found dead two weeks after being turned out to grass. It was one of eight purchased three weeks earlier. Postmortem examination detected prominent reactive Peyer's patches and fluid large intestinal contents. There was no evidence of patent coccidiosis and culture of *Clostridium perfringens* from the ileum was the only potentially significant bacteriology finding. Small intestinal contents tested positive for epsilon toxin. Histopathology revealed huge numbers of immature coccidial forms localised to a single section of ileum. Damage was limited and this was considered an incidental finding most likely due to infection with *Eimeria auburnensis* which is not considered to be a highly pathogenic species. In other sections of small intestine areas of focal necrosis, 90 per cent of which involved the Peyer's patches, were found to be associated with large numbers of clostridial type bacilli. It was postulated that this represented an atypical multifocal necrotic enteritis involving *Clostridium perfringens* with subsequent production of epsilon toxin. The recent diet change was thought to be a possible predisposing factor. (C471330)

SMALL RUMINANTS

Generalised and systemic conditions

A group of 250 one-month-old crossbred lambs was handled for administration of a clostridial vaccine, parapox virus vaccine and moxidectin injection. Three days later three lambs were found dead or dying and submitted for postmortem examination. The hindlimbs of the first were swollen and an area of dark dry emphysematous muscle was found in the quadriceps (Fig 1). Lamb two had an increased volume of cloudy pericardial fluid and lamb three had a fibrinous pleurisy and pericarditis. Blackleg was suspected in lamb one and fluorescent antibody testing of muscle proved positive for *Clostridium chauvoei.* Histopathology of tissues from lamb three detected severe coagulative necrosis with haemorrhage and gas formation with numerous clostridial bacteria in the myocardium consistent with a diagnosis of cardiac blackleg. Blackleg was also strongly suspected in lamb two although typical lesions were not found. Further history was obtained and it was confirmed that a needle and syringe rather than a vaccine gun/sterimatic injector had been used. In addition, one bottle of vaccine had been open for at least six weeks. These factors may have contributed to the losses.

Figure 1 – Area of dark emphysematous muscle in a lamb with blackleg

A one-month-old beltex cross lamb was found dead and submitted for postmortem examination. The carcase appeared jaundiced with watery blood and a friable orange liver, however liver and kidney copper results were within normal limits. *Escherichia coli* was cultured from the liver and spleen but not considered significant at the time. Histopathology revealed subacute hepatic necrosis and cholestasis with fibrin thrombi within the liver and rarely in the pulmonary circulation. These findings were consistent with disseminated intravascular coagulation which in ruminants is most often secondary to septicaemia or endotoxaemia. Examination of a second lamb that had been found dead identified cloudy meninges and histopathology confirmed a severe suppurative meningitis plus mild epicarditis and pleuritis. No bacteria were visible and cultures remained sterile.

Taken together the findings from both lambs indicated septicaemia as the cause of death. It was postulated that the *E coli* isolated from the first lamb may have been significant despite colisepticaemia usually being associated with younger lambs.

A flock reported the death of lambs aged between four days and two weeks. A haemorrhagic scour was observed in some, and affected lambs died rapidly. The carcase of one lamb was submitted and the presence of a good milk clot in the abomasum confirmed that it was a true sudden death. The proximal jejunum was dark red with emphysema within the wall and dark haemorrhagic contents (Fig 2). A small area of similar pathology was found at the blind end of the caecum and the hindquarters were faecal stained. Ileal contents tested positive for alpha, beta and epsilon toxin confirming a diagnosis of clostridial enterotoxaemia type B (lamb dysentery). The farmer had mentioned that one batch of ewes had not received their clostridial vaccine booster pre lambing and this was considered to be responsible for the outbreak.

Figure 2 – Emphysema within the jejunual wall in a case of lamb dysentery

Respiratory tract diseases

Fifty blue faced Leicester ewes in lamb to AI were housed in a large shed until six weeks after lambing. At this time 10 of the 100 lambs were described as severely affected by respiratory disease while others had milder clinical signs. Lambs were reported to be slow, lose condition and become progressively dyspnoeic. Five had died and a lamb that had been ill for three weeks was euthanased for postmortem examination. This revealed anteroventral consolidation of both lungs and *Pasteurella multocida*, *Mannheimia haemolytica* and *Mycoplasma ovipneumoniae* were all detected. PCR testing for ovine parainfluenza 3 virus and border disease virus proved negative. Histopathology confirmed an active chronic bacterial pneumonia with mycoplasmal involvement. It was postulated that housing the small flock in a large shed meant that ventilation was not as good as expected as they would be unable to generate a stack effect.

Musculo-Skeletal conditions

A lowland flock of 250 Cheviot ewes reported that around ten lambs had been breathing heavily since birth. Four others were described as having bendy legs or a wide based stance from birth. One of these was euthanased at ten days of age after becoming dyspnoeic. Postmortem examination found that the caudal rib cage had a concave appearance (Fig 3), and fracture calluses were present bilaterally on ribs 9 and 10. No abnormalities were detected in the long bones and analysis did not reveal any mineral deficiency. Histopathology of the rib fractures revealed abundant deposition of collagen that was birefringent when viewed under polarised light. Extrapolating from cattle this finding indicated that the fractures been present for at least three weeks confirming that they had occurred in utero. Genetic disorders that have previously been reported in association with intrauterine fractures include osteogenesis imperfecta, osteopetrosis, hypophosphatasia and Ehlers-Danlos syndrome involving a genetic mutation of type I collagen. Other acquired factors that may increase the risk of intrauterine skeletal fragility include vascular compromise of the fetal skeleton and maternal metabolic abnormalities. There was no histological evidence of osteopetrosis or of rickets. Investigation into the genetic relationships is ongoing, however the other affected lambs improved and were reported to be growing normally.

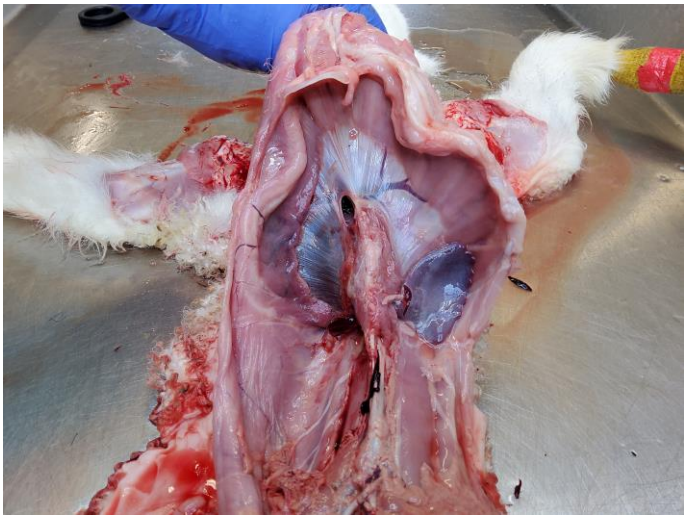

Figure 3 - Abdominal surface of the diaphragm. Concave appearance to both sides of the thoracic wall in a lamb with a suspected congenital bone deformity

Circulatory system disorders
A six-week-old castrated male Texel cross lamb was submitted for investigation after being found dead with no previous signs of ill health. Postmortem examination detected diffusely wet lungs, a small fibrin clot in the pericardium and yellow vegetative lesions on the right and left atrioventricular valves. The spleen was enlarged and a small amount of yellow fibrin was found in the right shoulder joint. The findings suggested septicaemia and *Enterococcus faecium* was cultured in pure growth from the joint and was the predominant isolate from the heart valve. Histopathology confirmed endocarditis associated with large colonies of cocci, the morphology of which was consistent with *E faecium*. Additional findings included bacterial emboli in the lung and liver, and synovitis in the shoulder. The tail docking or castrating sites could have acted as a portal of entry, although at the time of presentation both appeared to be healing well.

BIRDS

Poultry
A 15-week-old leghorn chicken became anorexic and was too weak to stand for 24 hours prior to being euthanased. It had been purchased five weeks earlier with another four birds and added to a flock of 30 all of which appeared healthy. Postmortem examination was not diagnostic, but histopathology detected a severe non suppurative meningoencephalitis with perivascular cuffing and gliosis. This was considered consistent with the "transient paralysis" form of Marek's disease

MISCELLANEOUS

Camelids
Two male alpacas from a group of seven died over the course of one week. The first was found dead but the second was initially noted to be lethargic and hyperpnoeic. Further examination detected tachycardia, anaemia and poor body condition. Both carcases were very pale with an increased volume of serosanguinous thoracic, pericardial and peritoneal fluid. No worms were observed but the history and postmortem examination findings together with high strongyle egg counts of 8350 and 12350 eggs per gram suggested a diagnosis of haemonchosis. This was confirmed by peanut agglutinin testing with 98 and 99 per cent of eggs fluorescing under ultraviolet light. Both alpacas had been purchased from the same source in north-west England in January 2022. They had not received anthelmintic treatment on their new holding and their previous worming history was unknown. It was advised that worm egg counts should be monitored in the rest of the group.