

### OVERVIEW

- **Hypocuprosis causing poor growth rates in suckled calves**
- **Chronic copper toxicity in seven-month-old blue faced Leicester lambs**
- **Production losses due to parasitic gastroenteritis in lambs from multiple flocks across Scotland**

### GENERAL INTRODUCTION

September was drier and sunnier compared to the thirty-year average with 63 per cent of rainfall and 118 per cent sunshine hours. The mean temperature was 0.6°C below the 1991 to 2020 average.

#### DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in December 2023. Given similar climatic and production conditions, they could also be important this year.

- **BVD viraemia: impacts on calf health**  
Active circulation of BVD virus can play a role in outbreaks of calf disease via its immunosuppressive effects. Persistent issues with pneumonia or enteritis that prove difficult to control should raise the possibility of BVD as a predisposing factor. The presence of purchased animals of unknown BVD status should be another red flag. Selection of the most appropriate testing strategy will depend on the age and history of the animals involved.
- **Nitrate/nitrite toxicity**  
Multiple sudden deaths in sheep were reported following unrestricted grazing of turnip tops. Carcasses were generally pale with a brown tinge to the viscera and dark brown urine. Following ingestion nitrates are converted into toxic nitrites by bacteria within the gastrointestinal tract. Nitrites are then absorbed into the circulation where they combine with haemoglobin to form methaemoglobin. Methaemoglobin is unable to transport oxygen and is the cause of the characteristic brown discolouration. If suspected animals should be removed from the field and re-introduced slowly by strip grazing with provision of supplementary forage. Risk factors for increased nitrate storage in plants could include late season application of nitrogen fertiliser or frosty conditions followed by warmer wet weather.

### CATTLE

#### Nutritional and metabolic disorders

A beef herd reported that ten per cent of this year's calves were smaller than usual and poorly muscled with rough coats. Blood samples from five affected calves returned very low copper results of 1.1, 1.6 and 1.9 umol/l with two below the lower detectable limit of the test (reference range 8 – 25 umol/l) confirming a diagnosis of hypocuprosis. Cows on the holding received trace element boluses twice a year.

#### Generalised and systemic conditions

A dairy herd reported the death of two five-month-old calves in three days from a group of 15 animals that had recently changed pen. Both had died rapidly after being found in lateral recumbency with suspected neurological signs. The carcass of a Holstein heifer was submitted, and postmortem examination identified widespread petechiation, five litres of yellow ascitic fluid, hepatosplenomegaly, generalised lymphadenopathy and cloudy meninges. The findings were consistent with septicaemia and pure growths of *Escherichia coli* were isolated. Colisepticaemia is more usually associated with the death of neonatal calves, however previous cases have been recorded in this age-group. Histopathology confirmed bacterial septicaemia as the cause of death.

#### Alimentary tract disorders

The carcass of a four-month-old British blue cross calf was submitted after it became the third to die from a group of 14 purchased two months before. The group had been turned out to grass on arrival and had been losing condition since. They were treated for coccidiosis and re-housed four weeks prior to submission. The calf was thin with linear ulcers on the nose and hard palate. Extensive 2 mm to 2 cm circular lesions were found on the lateral and ventral tongue (Fig 1). The intestinal content was watery and grey however comprehensive testing failed to detect any enteric pathogens. Histopathology confirmed bovine papular stomatitis as the cause of the oral lesions and this was considered to be secondary to summer scour syndrome. This is a diagnosis of exclusion and is thought to be due to failure to adapt to a grass-based diet particularly when stocked on lush pastures with a high crude protein and low fibre content.



**Figure 1 – Circular lesions on the ventral tongue due to bovine papular stomatitis**

Two, three-year-old Aberdeen Angus cross heifers at grass were noted to be in abdominal discomfort and moving slowly and stiffly. On clinical examination they were dull, hypothermic and occasionally grunted. Ruminal contractions were absent. Symptomatic treatment including calcium was unsuccessful and one died. Postmortem examination found a distended rumen containing fibre, polystyrene and a very large volume of fluid. The pyloric outflow was obstructed by a mass of polystyrene and the abomasum was impacted. Polystyrene was also present within the proximal intestine.

## SMALL RUMINANTS

### Nutritional and metabolic disorders

Four, seven-month-old blue faced Leicester (BFL) lambs from a group of 56 were reported to be lethargic and two others had died. They had been given an anthelmintic drench and a trace element bolus five days before. Concentrate feed had been available ad lib since birth until ten days earlier when trough feeding was introduced. The submitted carcass was jaundiced with dark red-black kidneys, an orange-brown liver and dark red-brown urine indicative of haemolysis. Chronic copper toxicity was suspected and confirmed on analysis of liver and kidney: liver 15,396  $\mu\text{mol}$  copper/kg dry matter (DM)

(reference range 314 to 7,850  $\mu\text{mol}/\text{kg}$  DM); kidney 2,734  $\mu\text{mol}$  copper/kg DM (reference range <787  $\mu\text{mol}/\text{kg}$  DM). The liver result was below the threshold that requires notification of Food Standards Scotland. The combination of prolonged concentrate feeding, copper from two sources and breed susceptibility lead to the losses in this case with the surviving sheep likely to have copper loaded livers.

### Parasitic diseases

Parasitic gastroenteritis was a common diagnosis in lambs submitted for investigation of ill thrift during September with multiple flocks affected across Scotland. A Scottish blackface flock gathered the hill to wean the lambs and found that they were 20 lambs short. A further nine lambs from 300 were found dead over the course of the next week. Three lean carcasses weighing 13, 14 and 16 kg were submitted, and all found to be extensively faecal stained. Consolidation of between 30 and 40 per cent of the lung parenchyma was noted in two from which *Mannheimia haemolytica* was isolated. Linear ulcers were found in the distal oesophagus of one and all had diarrhoeic faeces. Strongyle egg counts ranged from 2,700 to 28,550 eggs per gram (epg) and significant numbers of nematode worms were recovered with an average of approximately 20,000 from the abomasa and 25,000 from the small intestines. *Teladorsagia* and *Trichostrongylus* spp predominated with no *Haemonchus contortus* detected in this case.

### Generalised and systemic conditions

Six weaned lambs from a group of 400 were found dead over the course of one week. Body condition was considered adequate, and no evidence of diarrhoea was reported - with the exception of the lamb submitted for postmortem examination. This revealed a pericardial effusion containing a large fibrin clot, and marked renal autolysis which together suggested a diagnosis of clostridial enterotoxaemia type D. Diarrhoea was evident and small to moderate numbers of immature rumen fluke were found in the duodenum. Epsilon toxin was detected in ileal contents confirming pulpy kidney as the cause of death. It was proposed that the presence of immature rumen fluke could have altered either small intestinal motility and/or flora predisposing to clostridial disease. The lambs had not received a clostridial vaccine.

### Nervous system disorders

Sugar beet was introduced to a group of 20 zwartbles ewes and lambs as they had been set stocked for two months and pasture availability was decreasing. One week later a six-month-old lamb was found dead and a second was reported to be ill. Postmortem findings of a pericardial effusion containing a fibrin clot were



suggestive of pulpy kidney but screening small intestinal contents for epsilon toxin proved negative. Brain histopathology was carried out and revealed severe polioencephalomalacia consistent with a diagnosis of cerebrocortical necrosis (CCN). Significant parasitic gastroenteritis was an additional finding.

Footrot vaccine was administered to a group of 136 mules and gimmers. In the next few days 24 became lethargic and ataxic and four went on to die. There was some response to treatment with antibiotics plus corticosteroids and a number of ewes recovered. Two demonstrated a head tilt and a recumbent ewe was euthanased for investigation of the problem. Postmortem examination identified seven abscesses 0.5 - 2.0 cm in diameter between the muscles of the right lateral neck approximately 10 to 15 cm caudal to the base of the ear, and purulent material was found in the atlanto-occipital joint (Fig 2). An excessively long needle had been used resulting in the vaccine being injected intramuscularly rather than subcutaneously. Infection had then tracked into the atlanto-occipital joint.



**Figure 2 – Purulent material in the atlanto-occipital joint secondary to poor injection technique**

A four-month-old easycare lamb described as looking “vacant” collapsed and had a convulsion when examined. It was treated for suspected CCN but died overnight and was the only loss from a group of 70 recently weaned lambs. Postmortem examination detected a significant *Teladorsagia* sp burden relevant to the remaining lambs, but did not confirm the cause of death. Histopathology found a severe, multifocal to coalescing, necrotising and lymphoplasmacytic meningoencephalitis with micro abscesses consistent with listeria encephalitis. No supplementary feeding was being given and soil was the most likely source of *Listeria monocytogenes*.

## Skin diseases

Five Hebridean sheep from a flock of 50 had a three-week history of severe crusting and purulent discharge affecting their heads (Fig 3). Small crusts had been observed around the muzzle of other animals. Treatment with antibiotics and corticosteroids elicited a clinical improvement in three cases but one animal died and the fifth continued to deteriorate. PCR testing of a sample of scab confirmed involvement of orf virus.



**Figure 3 – Hebridean sheep with extensive facial dermatitis associated with orf (Crown Vets)**

## PIGS

### Musculoskeletal conditions

Three landrace cross gilts developed hind limb paresis with knuckling, but no apparent involvement of the fore legs. All three were close to farrowing and managed in an outdoor system with 130 animals in the group. One died and was submitted for investigation of the issue. Superficial erosions were noted over the carpal joints with some oedema and haemorrhage observed within and between the muscles of the hind legs. No joint lesions were identified but subtle changes could have been masked by autolysis. The vertebral column was split and no spinal lesions found. Histopathology identified a thin layer of fibrin on the synovial membrane with vasculitis and thrombosis in the adjacent blood vessels. These findings suggested *Erysipelas rhusiopathiae* arthritis as the cause of the clinical signs, however it was not detected on culture and the gilts were reported to have been vaccinated.

## DEER

A nine-year-old red deer died immediately after handling for antler removal. The carcass was submitted for investigation as a single stag had died in similar circumstances in each of the previous three years. Postmortem examination was unremarkable however histopathology revealed acute multifocal myofibre degeneration in the myocardium with milder changes apparent in skeletal muscle. Degeneration is not immediately detectable on light microscopy therefore it was considered that more extensive damage was likely to be present. There was no evidence of myoglobinuria confirming the acute nature of the damage. The findings were consistent with a diagnosis of capture myopathy which can present as hyperacute (as in this case), acute, sub-acute or chronic forms. Hyperthermia, weakness, a stiff gait or muscle tremors can all be seen in animals that survive longer. Renal (subacute) and heart failure (chronic, after two to four weeks) are recognised sequelae. Reducing the stress associated with handling and avoiding hot days for planned management work may be of benefit.