

OVERVIEW

- Neonatal IBR in suckled calves at grass
- Q fever as a cause of still birth in dairy heifers
- Neonatal lamb deaths as a consequence of clostridial enterotoxaemias
- Malignant catarrhal fever in red deer and cattle

GENERAL INTRODUCTION

May was warm and dry compared to the 1991 to 2020 period with the mean temperature 1.2°C higher and only 44 per cent of average rainfall. Sunshine figures amounted to 172.6 hours which was 95 per cent of average.

DISEASE ALERTS

The following conditions were reported by SRUC VS disease surveillance centres in August 2022. Given similar climatic and production conditions, they could also be important this year.

- **Nutritional myopathy in suckled calves**
Nutritional myopathy (white muscle disease) affects those muscles with the highest rates of oxidative metabolism. Lesions in cardiac muscle can present as sudden death, while lesions in the intercostal muscles and diaphragm can result in dyspnoea that could be mistaken for pneumonia. Where skeletal muscles are affected calves may appear stiff or recumbent. Clotted and heparinised blood samples should be collected to allow glutathione peroxidase (GSHPx) and vitamin E analysis. In acute cases detection of very high creatinine kinase (CK) levels is consistent with severe muscle damage. Lesions are not always apparent or diagnostic on postmortem examination therefore sections of myocardium, diaphragm, intercostal and skeletal muscles should be fixed in formalin for histopathology.
- **Outbreaks of haemonchosis in sheep**
August and September are the peak months for diagnoses of haemonchosis with all ages of sheep at risk. Weakness, anaemia, ill thrift and sudden death are possible presenting signs. Diarrhoea is not a feature unless there is an additional significant mixed nematode burden. *Haemonchus contortus* worms are visible on the abomasal mucosa and their fecundity can result in very high strongyle egg counts. If postmortem material is unavailable the diagnosis can also be made following peanut agglutinin straining of strongyle eggs recovered from faeces. *H. contortus* eggs fluoresce when viewed under ultra-violet light in this test.

CATTLE

Generalised and systemic conditions

A four-year-old Aberdeen Angus bull died within three days of becoming anorexic and pyrexemic. There was crusting of the skin around the muzzle, and it was reluctant to swallow. Postmortem examination revealed sloughing of the mucosa of the upper respiratory tract plus pulmonary oedema and emphysema. Histopathology detected severe lymphocytic vasculitis in all tissues examined and diffuse epithelial necrosis in the pharynx. These findings were considered consistent with malignant catarrhal fever and ovine herpesvirus-2 (OHV-2) was detected on PCR testing of spleen. No known exposure to sheep had occurred and the farm was asked to review biosecurity including equipment, trailers and feedstuffs to see if indirect exposure could have occurred.

Respiratory tract diseases

Eight of 40 Aberdeen Angus suckled calves at grass were reported to have upper respiratory noise and be frothing/drooling at the mouth. Two, 10-to-12-day-old calves died and postmortem examination of both revealed pharyngitis and glossitis with inflammation and erosion of the nasal and oropharyngeal mucosae (Fig 1). Bovine herpesvirus-type 1 was detected on PCR testing of laryngeal swabs confirming a diagnosis of neonatal IBR. Histopathology supported this diagnosis with frequent epithelial syncytia formation and intranuclear viral inclusion bodies within ulcerated areas. Calves from three groups were affected and a single cow also developed clinical signs, however the source of the outbreak was unclear. No animals had been added although a cow from the neighbouring holding had strayed and mixed with some cattle earlier in the year. Recrudescence of latent infection in a predominantly naïve, unvaccinated herd was another possible explanation.



Figure 1 – Pharyngitis in a case of neonatal IBR

Reproductive tract conditions

The placenta from a stillborn Aberdeen Angus cross calf was submitted in order to investigate a possible role for Q fever as the cause of a high stillbirth rate in dairy heifers. There was evidence of placentitis with necrosis of the cotyledons. Intracellular acid-fast organisms were detected in a modified Ziehl-Neelsen stained smear of placenta (Fig 2) and PCR testing was positive for *Coxiella burnetii*. Histopathology confirmed a multifocal necrotising placentitis with large numbers of intracytoplasmic bacteria in the trophoblast cells consistent with a diagnosis of Q fever. The homebred heifer replacements in this herd were reared on a different premises until late gestation and this was considered a risk factor resulting in heifers being naïve to *Coxiella burnetii* on their return.

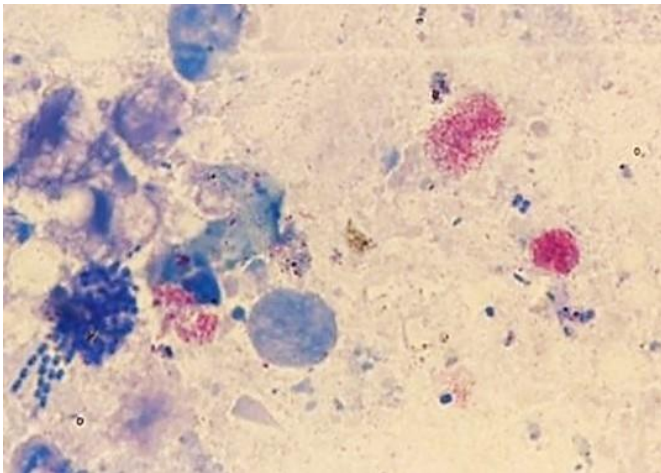


Figure 2 – *Coxiella burnetii* in a modified Ziehl-Neelsen stained smear of placenta

Mammary diseases

A nine-year-old Holstein cow that had been dried off 48-hours previously using both teat sealant and antibiotic tubes developed acute mastitis and died. It was the fourth cow to die with a similar presentation since January. Postmortem examination found extensive haemorrhage over the internal viscera and watery blood-tinged milk within the right fore and hind quarters. *Pseudomonas aeruginosa* was isolated in a pure growth from the udder and in mixed growth from the lung. Contaminated water is often considered to be the source of *P aeruginosa* and it has previously been recorded as a cause of death in the early dry period.

Nervous system disorders

The second of two belted Galloway heifers born in a moribund state was submitted for postmortem examination. It was in lateral recumbency with opisthotonos, vertical nystagmus, a fine tremor and no menace response. It also had brachygnathia superior

and a domed head. Examination of the brain revealed enlarged lateral ventricles with resultant thinning of the cerebral cortex and a thin translucent membrane between the ventricles (Fig 3). The liver was pale, and the kidneys were enlarged with a green-tinge and small numbers of fluid filled cysts. PCR testing proved negative for BVD virus and congenital alpha mannosidosis was suspected. Histopathological findings supported this diagnosis with vacuolation identified in many sites including the liver, spleen, kidney, thyroid, cardiomyocytes, and cerebral neurones. Genetic screening showed that the calf was homozygous for the alpha mannosidosis mutation proving that both dam and sire were carriers of the defective gene. This condition has an autosomal recessive mode of inheritance and has previously been well described in Galloway and Aberdeen Angus cattle.¹ It causes an inherited deficiency of the enzyme alpha mannosidase resulting in storage of water-soluble oligosaccharides within vesicles. Clinical signs can vary from stillbirth to severe congenital neurological disease.

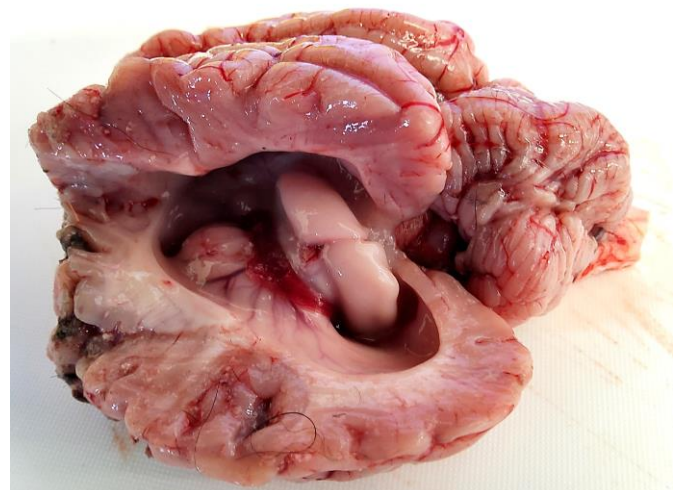


Figure 3 – Congenital hydrocephalus in a belted Galloway calf with alpha mannosidosis

A group of 27 autumn calving cows were presented as slow and empty looking. They were usually wintered outside but in 2022 had been housed and turned out onto hill grazing in mid-April. Clinical signs were noted two weeks later, and affected animals had pale mucus membranes and packed cell volumes of between 9 and 16 per cent confirming significant anaemia. Ticks were found on the calves and on the ventral abdomen and below the tail of the cows. Intra-erythrocytic inclusions consistent with *Babesia* sp. were detected in Giemsa-stained blood smears from two of four animals. All four samples tested positive in the more sensitive PCR test, and DNA sequencing confirmed infection with *Babesia divergens*. Haemoglobinuria was not observed initially but was seen in some cases later on. The group were

treated with imidocarb and were reported to be recovering. The change in management may have precipitated the outbreak if the cows were exposed to a high babesia challenge at a time when their immunity may have dipped following the housing period.

SMALL RUMINANTS

Parasitic diseases

A small flock of 90 ewes managed as one group reported that ten lambs had died in the four weeks since turn out. The carcase of a six-week-old Dorset cross lamb was submitted and noted to be faecal stained. Prior to this diarrhoea had not been observed in the group. The mesenteric lymph nodes were enlarged, and worms were visible within the intestinal content. The small intestines were washed out and approximately 31,700 predominantly *Nematodirus battus* worms recovered. Infection was patent with 2500 *N battus* eggs per gram faeces. Anthelmintic treatment was advised, and a disease alert was issued to veterinary practices in the area.

Generalised and systemic conditions

Clostridial enterotoxaemias caused the deaths of neonatal lambs during May. Three, four-to-five-day-old Scottish blackface lambs in the same field died after developing a haemorrhagic scour and two were examined postmortem. Both had milk present in the abomasum with emphysema and multifocal petechiation throughout the jejunum. Lamb dysentery was suspected and confirmed on isolation of *Clostridium perfringens* and detection of beta and epsilon toxins from the small intestinal contents. A clostridial vaccine had been administered to the ewes pre-lambing however a ZST result of 9 units (target >14 units) in one lamb confirmed failure of passive transfer. Blood from the second lamb was unsuitable for testing. A two-day-old Suffolk-cross lamb on a different holding died after a short period of recumbency during which it was initially rigid and then relaxed and floppy. Postmortem examination findings of pericardial effusion, mild lung oedema, renal autolysis and cerebellar coning suggested a diagnosis of pulpy kidney. Small intestinal contents tested negative for epsilon toxin, however focal symmetrical encephalomalacia was detected on brain histopathology confirming clostridial enterotoxaemia type D (pulpy kidney) as the cause of death. There was no evidence of hypogammaglobulinaemia in this case with a ZST result of 33 units (target > 14 units), however the ewes had not received a clostridial disease vaccine.

A three-crop Scotch halfbred ewe rearing two-week-old twin lambs at grass became acutely ill and recumbent with tachycardia, tachypnoea and pyrexia. Antibiotic and

NSAID treatment was administered but the ewe died within an hour and the carcase was submitted for postmortem examination. A yellow, fibro-necrotic exudate extended from the pharynx to the proximal oesophagus. There were multifocal pleural adhesions in the left thorax and petechial haemorrhages on the parietal pleura. The airways contained an abundance of white froth and the lungs were dark purple, diffusely congested and oedematous. Further petechial haemorrhages were noted on the epicardium and renal cortex. Septicaemia was suspected but cultures were not diagnostic. Histopathology identified foci of acute necrosis and inflammation in cardiac and skeletal muscle confirming acute systemic disease and *Histophilus somni* was suggested as the likely cause. PCR testing of heart confirmed this to be the case. We are increasingly aware of *H somni* myocarditis and septicaemia in sheep however, as yet it appears to only cause individual losses.

Respiratory tract diseases

A two-week-old Valais blacknose lamb with a short history of respiratory disease was treated with antibiotics, corticosteroids and NSAIDs but was found dead unexpectedly. At postmortem examination the anteroventral portions of both lungs were firm, dark red and sank when placed in formalin. Bacterial bronchopneumonia was suspected but cultures were sterile. Histopathology failed to detect any evidence of infectious disease but identified large quantities of mucus within the bronchioles and alveoli. Airway obstruction was considered to be the cause of atelectasis affecting over 50 per cent of the alveoli, and centrilobular hepatocellular degeneration suggested that fatal respiratory compromise had occurred as a result. Two hypotheses were suggested as possible explanations for the accumulation of mucus – increased viscosity or a primary ciliary dyskinesia, neither of which has been described in sheep. No further cases were reported, however blood samples from the dam and sire have been stored should further investigation be required in the future.

Musculo-Skeletal conditions

A flock experiencing annual issues with joint ill submitted an untreated two-week-old beltex cross lamb with typical clinical signs. Between 10 and 15 per cent of the 2022 lamb crop required treatment and in 2023 lambs from all groups were reported to be affected. Ewes lambed at grass and were then housed in individual pens for a short time. The submitted lamb had a visibly swollen right carpus as a result of septic arthritis which was also confirmed in the left elbow, carpus, hock and stifle. *Streptococcus dysgalactiae* was isolated and as expected was resistant in vitro to oxytetracycline. Crusting was noted around the ear tag

and tail ring and although there was no visible evidence of infection it is known that both sites are possible routes of entry for *S dysgalactiae*. Advice was given to use surgical spirit when tagging lambs and, as the organism can be isolated from vaginal swabs, to wear gloves for assisted lambings.

PIGS

Generalised systemic diseases

A 500-sow high health herd reported an increased incidence of swollen joints, lameness and sudden deaths in weanling piglets. This coincided with the purchase of gilts from another high health herd. Two, five-week-old white rock piglets were submitted to investigate the problem. They originated from a group of 80 weaners where 12 were affected and five had died. They had been treated with antibiotics around a week prior to death. Postmortem examination revealed fibrinous pleurisy, pericarditis (Fig 4), and peritonitis in both cases. Further findings included interlobular pulmonary oedema and a small volume of excess synovial fluid in several joints. Bacterial isolates from the lungs included *Streptococcus suis* from one and *Pasteurella multocida* from the other. *Glaesserella (Haemophilus) parasuis* was cultured from multiple tissues in both and further testing confirmed it to be serotype 13 which is considered to be highly virulent.² *Glaesserella (Haemophilus) parasuis* is carried in the nasal cavity of many healthy pigs and the virulent strain was presumed to have been introduced by the purchased gilts.



Figure 4 – Fibrinous pericarditis in a case of *Glaesserella (Haemophilus) parasuis* septicaemia

MISCELLANEOUS

Deer

The carcase of an eleven-month-old farmed red deer was submitted to investigate the death of three animals over a 72-hour period. They had been housed through the

winter on a silage-based diet in two groups of 90 animals. Postmortem examination found multiple grey foci in the kidneys and diffuse reddening plus irregular thickening of the large intestinal mucosa. Faeces were soft and yersiniosis was considered a differential diagnosis however there were no significant findings on bacteriology. Histopathology confirmed a necro-haemorrhagic and suppurative typhlocolitis with heavy bacterial colonisation of the luminal surface. Widespread perivascular inflammation in the submucosa and mesentery of the large intestine, lung and kidney raised the possibility of malignant catarrhal fever (MCF). PCR testing proved positive for ovine herpesvirus type 2 confirming the diagnosis. The source of infection was not clear from the history.

Camelids

A poorly grown ten-month-old alpaca with a week-long history of intermittent recumbency and abdominal pain deteriorated and died. It had been purchased with its dam in autumn 2022 and weaned in January. The carcase was thin and pale with serous atrophy of body fat, ventral subcutaneous oedema, and body cavity effusions suggesting anaemia and hypoproteinaemia. Gastric ulcers were found in C1 and multifocal raised nodular lesions in C3. Haemonchosis was suspected but a closantel drench had been given the previous day and no nematodes were recovered from the stomach. The strongyle egg count was 2400 eggs per gram. Forty-nine per cent of eggs fluoresced in the peanut agglutinin test proving them to be *Haemonchus contortus* and supporting a diagnosis of haemonchosis as the cause of death. Routine parasitology had been carried out at purchase and weaning with no worm eggs detected. Following weaning the alpaca had been managed in a group of eight adult females in a field that had not been grazed for 15 months. A small flock of sheep was present on the holding, but grazing was never shared. It was suggested that the alpaca may have been infected with hypobiotic *H contortus* larvae at the time of purchase.

References:

- 1 Embury DH and Jerrett IV. Mannosidosis in Galloway calves. *Vet Path* 1985;22(6):548-51
- 2 Kielstein P, Rapp-Gabrielson VJ. (1992) Designation of 15 serovars of *Haemophilus parasuis* on the basis of immunodiffusion using heat-stable antigen extracts. *J of Clin Micro*. 1992;30:862- 5