Increase in diagnoses of ovine pulmonary adenocarcinoma

- A rise in the number of cases of ovine pulmonary adenocarcinoma diagnosed in Scotland
- Suspected maternal hypovitaminosis A causing cerebral and ocular changes in a bovine fetus
- Concurrent *Pasteurella multocida* and bovine herpesvirus type 1 associated with bovine abortion
- Kyphosis in gilts associated with low bone ash content
- Inappropriate nutrition as a cause of death in point-of-lay hens

These are among matters discussed in the disease surveillance report for February from SAC Consulting: Veterinary Services (SAC C VS)

February was mild across Scotland. The mean temperature was 1.8°C above the 1971 to 2000 average and there were occasionally some exceptionally high temperatures. Central and eastern Scotland also experienced a dry month, with only one third of the normal rainfall seen in the Lothians and Aberdeenshire. Rainfall totals were close to normal in the north and west, making it a dull month in those areas. SAC C VS considered that the mild weather would contribute to the ongoing high levels of fasciolosis seen during the winter. Grass growth was strong for the time of year, raising concerns about over-condition of pregnant outwintered ewes.

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Cattle

Generalised and systemic conditions

Clostridial disease was diagnosed in both young and adult stock. Perth diagnosed clostridial myositis due to *Clostridium chauvoei* in a suckler herd in which three calves aged three months had died within 10 days. They had all appeared weak and in pain, and they deteriorated rapidly and died. At postmortem examination of the third calf to die, haemorrhage, putrefaction and subcutaneous emphysema were present in the areas of the mandible, ventral neck and brisket. Lesions extended deep into the muscle and fluorescent antibody testing (FAT) for *C. chauvoei* proved positive. The affected animals had access to an outdoor paddock where blackleg had been diagnosed in previous years. Although youngstock on the farm were routinely vaccinated against clostridial disease, vaccination of this batch of calves had been delayed.

Edinburgh diagnosed black disease in a housed two-year-old, in-calf Salers heifer. It was the third adult animal to have died over the previous few months. Postmortem examination revealed extensive subcutaneous haemorrhage and the carcase was in an advanced state of autolysis. The caudate lobe of the liver was pale, swollen and firm and, although FAT for *Clostridium novyi* proved negative, histopathology of the liver revealed changes typical of black disease. The affected group was treated with a pour-on flukicide known to be effective against adult flukes at housing and was due to be dosed again with nitroxynil. Liver fluke eggs were detected in caecal contents, which was consistent with adult fluke infection, but no immature fluke activity was seen on histological examination of liver sections.

Eighteen of a batch of 24 calves that were approximately seven months of age were confirmed as persistently infected with bovine viral diarrhoea virus (BVDV) on an Ayrshire dairy farm. The proportion of the batch affected appeared to be unusually high as the herd had implemented a BVDV vaccination policy several years previously. Investigations revealed that the dams of the calves, a batch of heifers, had not received a complete primary course of vaccination before they were served. Following service, these heifers had been contract-reared at a nearby unit where they had been housed with cattle from a different herd. There was a persistently infected animal among the stock from the other herd.

Reproductive tract conditions

Fetal deformities that included arthrogryposis, microphthalmia and cleft palate (Fig 1) were present in an aborted fetus of approximately seven months’ gestation. This was the second abortion in the previous three months. As these changes resembled those described in cases of Schmallenberg virus infection, an investigation was instigated according to a joint Animal Health and Veterinary Laboratories agency and SAC C VS protocol for possible orthobunyaviral infection in congenital ruminant malformations. Comprehensive virology screening was performed and Schmallenberg virus RNA was not detected by real-time PCR in the placenta, brain or spinal cord. In addition, no antibody to Boeder disease virus was
revealed very mild placentitis and multifocal stomach contents, and histopathology was recovered from both the placenta and placenta from a beef suckler unit. Following the submission of a fetus and type 1 (bHV-1) was diagnosed by Edinburgh of the cerebrum and developmental changes in the eye were found, both of which were suggestive of maternal hypovitaminosis A. SAC C VS advised that the maternal diet and cleft palate was determined. No cause for the arthrogryposis minerals should be assessed for adequacy of the Vitamin A. No cause for the arthrogryposis and cleft palate was determined. Abortion associated with the presence of Pasteurella multocida and bovine herpesvirus type 1 (BHV-1) was diagnosed by Edinburgh following the submission of a fetus and placenta from a beef suckler unit. P multocida was recovered from both the placenta and stomach contents, and histopathology revealed very mild placentitis and multifocal hepatic necrosis in association with small Gram-negative bacilli resembling P multocida. The lesions were also considered consistent with BHV-1 infection, and BHV-1 was subsequently detected by PCR. SAC C VS considered that the abortion was probably due to a combined infection. There was no history of associated respiratory disease on the farm of origin.

Small ruminants Nematodiroisis in lambs
The majority of diagnoses of Nematodirus battus infection are made during late spring and early summer (Fig 2). Diagnosis is usually straightforward: either large numbers of worms are recovered at postmortem examination or the characteristic eggs are identified in faecal samples from diarrhoeic lambs with patent infection. Some farms report continued diarrhoea or illthrift in lambs following treatment and SAC C VS considers that there are several possible explanations for this:
- Reinfection with larvae can occur rapidly if lambs remain on the same pasture and a second treatment after seven to 10 days may be necessary;
- Concurrent coccidiosis can be an issue in four- to eight-week-old lambs and medication for this can also be required;
- Dehydration and absorption of toxins through the damaged intestinal mucosa can lead to nephrosis in small numbers of lambs, which will continue to deteriorate and die.

N battus is the dose-limiting parasite for many anthelmintics. As a result, drenching must be carried out accurately, as underdosing will lead to treatment failure. The poor solubility of the older benzimidazoles such as mebendazole means that their efficacy can be reduced in severely diarrhoeic lambs. Although benzimidazole-resistant N battus have been detected in the UK (Mitchell and others 2011), the prevalence is unknown. Benzimidazoles should therefore remain the drug of choice for treating Nematodirus infections on most farms. This relaxes the pressure on the other anthelmintic groups (Stubbings 2011). SAC C VS recommends that 10 faecal samples should be collected 10 days after dosing to check treatment efficacy.

Parasitic diseases
Liver fluke infection continued to cause losses in February, when there were 39 diagnoses of chronic disease (Fig 3) but no acute disease. This compares with 17 diagnoses of chronic fasciolosis and one diagnosis of acute disease in February 2011. Losses included high barren rates at scanning, illthrift and death. On several occasions, Dumfries identified live adult flukes at postmortem examination two to three weeks after treatment with triclabendazole, and on five occasions Ayr reported positive fluke egg counts three weeks after treatment with triclabendazole. SAC C VS considers that these findings indicate treatment failure and the possibility of triclabendazole resistance.

Generalised and systemic conditions
A blood sample received at Dumfries from a one-year-old bluefaced Leicester tup with a history of dullness, illthrift and intermittent pyrexia proved positive for maedi-visna. Infection with maedi-visna virus has appeared to be on the increase in recent years (Ritchie and Hosie 2010). Inverness diagnosed systemic listeriosis in a two-year-old north country Cheviot ewe that was found dead. Postmortem examination of the autolysed carcass revealed abscesses in the kidneys and haemorrhages in the caecal mucosa. Listeria monocytogenes was detected and no BVDV-1, BVDV-2 or Border disease virus RNA was detected in the spleen. On histopathology, laminar necrosis of the cerebrum and developmental changes in the eye were found, both of which were suggestive of maternal hypovitaminosis A. SAC C VS advised that the maternal diet of haylage, beet pulp, bruised barley and SaC C VS considered that the abortion was probably due to a combined infection. There was no history of associated respiratory disease on the farm of origin.

Disease alerts
The following conditions featured in the SAC C VS report for May 2011. Given similar climatic and management conditions, they could also be important this year.
- Lead poisoning in calves at grass.
- Type II ostertagiosis in sucker cattle.
- Lamb dysentery (Clostridium perfringens type B disease) in young lambs.
- Nematodiroisis in older lambs.
- Starve-outs, yolk sac infection and rotavirus infection in gamebird chicks.
isolated from the liver, lung, abomasum and heart tissues. A diagnosis of systemic listeriosis was made on four occasions throughout Scotland during the month. In addition, there were five diagnoses of listerial encephalitis and two diagnoses of listerial abortion. *Listeria* species are present in soil and faeces, and associated diagnoses tend to increase in early spring. SAC CVS suspects that this is most likely due to the feeding of supplementary forage (particularly silage) pre-lambing, but that feeding of concentrates on the ground while there is poor pasture cover may also contribute.

**Respiratory tract conditions**

Ovine pulmonary adenocarcinoma (OPA) was diagnosed in a shearing Scottish blackface tup submitted to Dumfries. The animal was purchased in 2011 but subsequently lost weight and developed respiratory signs. Treatment with oxytetracycline was unrewarding and the tup was euthanased. A firm, grey tumour mass typical of OPA was found within both lungs at postmortem examination. OPA was also diagnosed in a second flock where there had been annual problems, with ewes showing increased respiratory effort and losing condition. Three of four submitted ewes had OPA lesions. St Boswells confirmed OPA in four flocks, noting that cases were now being seen in gimmers in one flock in which the problem had been recognised for some years. Overall, 10 diagnoses of OPA were made during February, which is double the number recorded in any month during 2011. Although this may indicate increasing levels of disease, SAC CVS suspects that greater proactive investigation of thin ewe problems may have led to the increased number of diagnoses.

**Nervous system disorders**

Inverness diagnosed cerebrocortical necrosis in two blackface hoggs aged eight months. Approximately 10 of a batch of 150 wintering lambs were reported to be showing signs of neurological disease. The batch had arrived on the farm in September 2011 and had grazed without worming or trace element supplementation ever since. Three affected animals responded to treatment with B vitamins and antibiotics. Two untreated lambs were submitted live and were then euthanased for postmortem examination. Both were recumbent and one was hyperaesthetic. The brains of both animals were oedematous in appearance but did not fluoresce under UV light. Histopathology confirmed a diagnosis of cerebrocortical necrosis. Selenium deficiency, with glutathione peroxidase results below 20 iu/ml red blood cells (RBCs) (reference range >50 iu/ml RBCs), was also present in both cases.

**Skin diseases**

Samples were submitted to St Boswells from sheep with severe foot lesions. PCR testing detected *Dichelobacter nodosus*, the causal agent of footrot, but also treponemes. The latter finding suggested the presence of contagious ovine digital dermatitis.

**Pigs**

**Nutritional and metabolic disorders**

Kyphosis affected 5 to 10 per cent of six-week-old pigs on a rearing unit. Mildly affected pigs would reach finishing, but more severely affected pigs became recumbent and were culled. Examination of a six-week-old gilt revealed a deformed seventh thoracic vertebra (T7). The calcium and phosphorus levels of bone were within reference limits, but bone ash was low at 14 per cent in the rib and 22 per cent in the femur (reference range >50 per cent). A 12-week-old gilt that was also examined had kyphosis at T7-T8. Bone calcium and phosphorus were again within the reference ranges, but bone ash was low at 37 per cent in each of rib and femur. SAC C VS suspects that the kyphosis in these cases had a nutritional aetiology.

**Generalised and systemic conditions**

Greasy pig disease (exudative epidermitis) was diagnosed in a five-week-old boar. Two pens of 250 pigs were affected and morbidity reached 25 per cent. Affected pigs started to display skin lesions from about 10 days of age. The affected groups were being treated with apramycin, trimethoprim/sulphonamide and tiamulin. The majority of the skin surface of the submitted pig was covered with dark brown flakes and greasy exudate. The subcutaneous lymph nodes were enlarged and oedematous. The presence of *Staphylococcus hyicus* was confirmed, along with growths of *Pseudomonas aeruginosa* and *Staphylococcus sciuri*.

A diagnosis of severe pericarditis and early valvular endocarditis with concurrent *Streptococcus porcinus* infection was made in a six-month-old boar that died suddenly within 24 hours of transport to a new premises. Significant findings on postmortem examination included severe...
fibrinous pericarditis with adhesions to the sternum. Some thickening of the valve leaflets in the mitral and tricuspid valves was also present. One small discrete abscess was found in the right lung and there were adhesions to the ventral thoracic wall.

**Alimentary tract disorders**
Rotavirus was diagnosed in two- to three-day-old piglets from a 600-sow breeding unit in which 30 per cent of litters showed signs of scour and approximately 2 per cent of piglets died. Clinical signs developed from about three days of age, starting with vomiting and progressing to watery/yellow scour. It was noted that recovered piglets lost condition. Type C rotavirus was detected in the intestinal contents of all four piglets that were submitted to investigate the problem. Histopathology of intestinal sections revealed changes consistent with acute viral infection. These included acute degenerative changes affecting the tips of villi, with epithelial degeneration, early detachment, early villous atrophy and lymphocytic infiltration.

Colitis due to multiple aetiologies was diagnosed in growing and finishing pigs in four separate outbreaks. In one such outbreak, swine dysentery with concurrent *Yersinia enterocolitica* and *Salmonella Typhimurium* phage type 120 infections were diagnosed in a 14-week-old gilt. Three-quarters of the batch of 300 pigs had been affected with watery, bloodstained diarrhoea since arriving on the unit three weeks previously. There was no noticeable response to a seven-day course of in-water tiamulin, while some pigs treated with parenteral tiamulin responded initially but then relapsed. There was loss of body condition throughout the batch but no deaths had occurred. On postmortem examination of the submitted gilt, the colon was thickened and the mucosa was hyperaemic. The contents were watery and bloodstained. *B hustleitae*, *Y enterocolitica* and *S Typhimurium* were all isolated in culture from the colonic lesions.

**Musculoskeletal conditions**
A 16-month-old Large White/Landrace cross sow in an indoor unit became lame on the right hindleg after being served. The lameness did not resolve with treatment and the sow was euthanased on welfare grounds. Postmortem examination revealed severe purulent arthritis of the right hip joint, which had destroyed the joint and led to walled-off abscessation of the entire proximal femur and right pelvic area. No fractures or traumatic injuries were observed, and other examined joints were normal. The right femur was thin-walled with little marrow content. A heavy pure growth of *Arcanobacterium pyogenes* was isolated from the abscessed area.

**Birds**
Inappropriate nutrition was suspected to have contributed to the deaths of six birds from a small flock of 15 chickens. The birds died over a two-week period when approaching the point of lay. Four cockerels in the group were unaffected. Postmortem examination of four birds revealed that two had died from vent pecking and cannibalism, while severe visceral gout and urolithiasis were found in the other two carcasses submitted. The birds had hatched at home and had subsequently been housed inside on deep litter. They received layers’ pellets during rearing. SAC C VS concluded that excess energy levels in the diet during rearing may have predisposed the birds to prolapsed oviducts and vent pecking as they came into lay. Similarly, excess calcium in the diet during rearing (as would have been present in layers’ pellets) can lead to urolithiasis when birds come into lay.

**Wild birds**
Malicious poisoning was suspected initially when a dead buzzard (*Buteo buteo*) and a mole (*Talpa europaea*) were found together. The mole could not be examined due to severe autolysis, but evidence of trauma was found in the buzzard. Subsequent radiography revealed multiple radiodense structures consistent with shotgun pellets. No agrochemical poisons were detected subsequently.

**Miscellaneous species**
**Dogs**
Coliseptiscope was diagnosed in a pair of five- to six-day-old Scottish terrier puppies submitted to Aberdeen for postmortem examination. One of the puppies was very small at birth and both had died after a period of malaise. Another puppy in the litter was lethargic. Profuse growths of *Escherichia coli* were isolated on culture of various tissues from both puppies.

A suspected case of *Campylobacter* zoonosis was identified during the month when a faecal sample from a six-month-old West Highland white terrier was positive for *Campylobacter jejuni*. The owner’s grand-daughter had recently been diagnosed with campylobacteriosis. *C jejuni* is the most common organism found in cases of human campylobacteriosis, and it may be isolated from the faeces of dogs and cats that show no concurrent clinical signs.

**Horses**
Severe suppurative meningoencephalitis was diagnosed in a Welsh section B gelding aged eight years that was submitted to Inverness for postmortem examination. The pony had recently developed a purulent right unilateral nasal discharge and was inappetent. Treatment for sinusitis was implemented and, after an initial improvement, the pony was found dead five days later. Postmortem examination revealed a diastema reaching approximately 3 cm beyond the clinical crown. However, there was no apparent communication with the sinus cavity. Opening the sinuses revealed purulent material in the right rostral maxillary sinus and the lateral compartment of the right dorsal conchal sinus. Purulent material was also present adjacent to the right cerebral hemisphere in the cranial vault. Bacterial cultures yielded a heavy mixed growth of anaerobe colonies including *Fusobacterium* species and *Prevotella melaninogenica* from samples taken from the brain and sinus. Neurohistopathology revealed acute suppurative meningoencephalitis and ventriculitis. Vasculitis and vascular thrombosis, most likely of bacterial origin, were also present.

**Deer**
A diagnosis of death from trauma due to fighting was returned in two four-year-old fallow deer bucks from a private collection. The bucks were noted to be rutting and were found as apparently simultaneous sudden deaths one morning. The owner reported a similar occurrence involving two large bucks the previous year. Postmortem examination revealed thoracic injuries including rib fractures and tearing of the parietal pleura in both animals. SAC C VS advised that changes to management to avoid having two well-matched individuals in the same group at rutting time may help to avoid such losses in the future.

**Foxes**
Severe thoracic trauma associated with a dog attack was diagnosed as the cause of death of a young adult vixen submitted to Edinburgh. The carcase was found in undergrowth with the tail neatly removed. Postmortem examination revealed widespread subcutaneous and intramuscular haemorrhage on both sides of the thorax. The intercostal tissues were damaged and there was free blood in the chest cavity. SAC C VS considered that the wounds were consistent with a bite from a large dog and that the tail had been removed after death. Screening for rodenticides revealed bromodialone and brodifacoum in the liver, and that the tail had been removed after death. Screening for rodenticides revealed bromodialone and brodifacoum in the liver, but not at levels that were considered to have contributed to the death.

**References**

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