

# Surveillance

## SAC C VS DISEASE SURVEILLANCE REPORT

# Neonatal calves affected by haemorrhages unrelated to BNP

- Unexplained haemorrhage in neonatal calves with no evidence of bovine neonatal pancytopenia
- Review of bovine abortion/stillbirth diagnoses
- Ear loss in Suffolk-cross lambs
- Stillbirth due to iodine deficiency in a Scottish blackface flock
- *Aspergillus niger* infection in ducklings

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

JUNE 2012 was the coolest June since 1998 and across southern and eastern Scotland it was the wettest June on record. Rainfall was 250 per cent to 300 per cent of normal in the Borders, Lothians and Fife, and the number of days with rain was among the highest in the past 50 years. In marked contrast, it was drier than average in Shetland and parts of the north-west and the Western Isles, with sunshine totals above normal in these areas.

American foulbrood (AFB) was confirmed in an apiary in Inverness-shire. AFB is notifiable under the Bee Diseases and Pests Control (Scotland) Order 2007 (as amended). It kills off bee larvae, is highly contagious and difficult to eradicate. Unlike European foulbrood (EFB), hives with AFB cannot be treated and must be destroyed. Appropriate disease control actions were taken. Beekeepers were urged to register on BeeBase, the national bee database, in order to assist Scottish Government Bee Inspectors control this and other diseases. This database provides beekeepers with access to up-to-date information on the control of AFB and bee-related issues.

### Cattle

#### Nutritional and metabolic disorders

Hepatic lipidosis was diagnosed by Dumfries following investigation of the death of an in-calf Holstein heifer that was imported from Holland four weeks earlier. Postmortem examination revealed slight

jaundice of the well-conditioned carcass and a pale and swollen liver. The liver tissue floated when placed in formalin and hepatic lipidosis was confirmed on histopathology. Metabolic disease was recognised previously in heifers transported over long distances in late pregnancy (VR, November 13, 2010, vol 167, p 796).

#### Toxic conditions

Two incidents of lead poisoning were diagnosed in June. The first outbreak occurred approximately three weeks after a group of 20 cows and five Charolais-cross calves were put out to grass in Aberdeenshire. Two calves died suddenly and one carcass was submitted for postmortem examination. The kidney lead level was elevated (63.6 mg/kg; reference range <20 mg/kg) and a lead battery was subsequently found in the field. Perth diagnosed the same condition in a 13-month-old Aberdeen Angus-cross bullock that was found dead at grass. Two more animals in the group of 35 were clinically unwell, displaying pyrexia and blindness. The source of the lead on this farm is still undetermined. In both incidents the Food Standards Agency was informed.

#### Generalised and systemic conditions

SAC C VS considered that trilineage hypoplasia, of the type seen in bovine neonatal pancytopenia (BNP), may have

contributed to a case of malignant oedema (false blackleg) in a two-week-old Charolais-cross bull calf submitted to Aberdeen. The calf was vaccinated against clostridial disease and turned out a week previously. It was found very weak and rapidly deteriorated despite antibiotic treatment. The right side of the face was swollen with subcutaneous oedema. Postmortem examination revealed a very dark focus in the muscle and *Clostridium septicum* was isolated. Cases of BNP were previously diagnosed in the herd and, although there was no evidence of haemorrhages or pallor in this case, the bone marrow was examined. On histopathology, the haematopoietic cell population was almost totally absent from more than 75 per cent of the section, leaving only congested, fatty connective tissue. The suppression of neutrophils may have hampered the normal immune response to *C septicum* infection.

Edinburgh investigated cases of unexplained haemorrhage, unrelated to BNP, in calves from two different farms. The first affected farm submitted two-day-old heifer twins for postmortem examination. Unusually, the twins had different sires with one being a Charolais-cross and the other a smaller Limousin-cross. Calving had been uneventful and both calves had sucked and appeared strong. The following day the Charolais-cross calf died shortly after it was found recumbent and apparently blind with its head tilted up. The Limousin-cross calf was euthanased the following morning after being found in extremis with tachycardia, pale mucous membranes, opisthotonos and melaena. At postmortem examination both carcasses appeared jaundiced with evidence of melaena. There was frank blood in the forestomachs and partially digested blood occupied most of



FIG 1: Diaphragmatic hernia in a calf following dystocia

the abomasum and intestines of each calf. The source of the blood could not be found. The kidneys and urine were dark brown/red in colour and histological examination revealed renal tubular necrosis in association with the presence of haemoglobin. SAC C VS proposed that the haemoglobin had been absorbed across the gut wall, perhaps using the same channels as colostral antibodies. Similar clinical and postmortem examination findings were present in a one-day-old Limousin-cross heifer from a different farm. Again no source of blood could be found. In all three calves bone marrow histopathology was unremarkable. Both herds were vaccinated against bovine viral diarrhoea (BVD) virus and there was no evidence of active infection in the herd. Neither herd owner was aware of any toxins, such as rodenticides that these calves or their dams could have had access to.

### Alimentary tract disorders

SAC C VS considered that milk medicated with antibiotics may have predisposed a case of mycotic rumenitis diagnosed in a five-week-old Holstein-Friesian heifer calf. The affected calf was in a batch fed on an automated suckling machine and was euthanased after failing to respond to treatment. Scour had been reported in younger calves the previous week. Postmortem examination revealed white, friable material adherent to the lining of the reticulorumen. Yeasts were recovered from these lesions and histopathology confirmed the diagnosis. Screening for BVD virus proved negative.

### Reproductive tract conditions

Ayr considered dystocia to be the cause of diaphragmatic rupture and abomasal herniation in a neonatal Simmental-cross bull calf. Calving was assisted and the calf, weighing 58 kg, died shortly after birth. Postmortem examination revealed bruising on both sides of the cranial thorax. The abdomen was filled with fresh blood and a rupture approximately 10 cm in diameter was evident in the diaphragm (Fig 1). This had allowed the abomasum, which was distended with a large volume of meconium-

tinged fluid, to herniate into the thoracic cavity. Subsequently, the lungs were only partially expanded. SAC C VS advised that cow condition should be managed to minimise difficult calvings, and that estimated breeding values for calving ease should be used when selecting bulls in future.

### Review of abortion/stillbirth diagnoses between 2004 and 2011

The incidence of different causes of outbreaks of bovine abortions or stillbirths diagnosed by SAC C VS between 2004 and 2011 is shown in Fig 2. Bacterial agents are the most commonly diagnosed cause of bovine abortions, with viruses, such as BVD virus and infectious bovine rhinotracheitis virus, only diagnosed occasionally. Over the past eight years *Bacillus licheniformis* infection was consistently the most frequently diagnosed cause of bovine abortion. The organism is widespread in the environment and poor-quality silage is the most likely source of infection. In the past three years the second most common diagnosis was infection due to *Trueperella* (previously *Arcanobacterium*) *pyogenes*. SAC C VS considers haematogenous spread from a septic focus to be the most likely cause of in utero infection. Dystocia is the third most common diagnosis in stillborn/abortion submissions. The other causes of abortion have occurred at a constant, relatively low level over the years.

A specific diagnosis is achieved in about a third of bovine abortion submissions. This is in contrast to ovine abortion submissions, in which a diagnosis is achieved in half to two-thirds of cases. The reasons for a lower bovine abortion diagnostic rate included: a lack of reliable tests for some infections such as leptospirosis; the degree of autolysis present; the timing at which the infection occurs in relation to the abortion; and the

frequent failure to submit placenta for examination. In addition, some abortions will occur due to physiological reasons (eg, a higher proportion of twins are aborted compared to singles).

### Musculoskeletal conditions

Inverness diagnosed dilated cardiomyopathy in a calf from a 50-cow suckler herd. Calves with a similar pathology were seen in this farm before and previous investigations found that, although affected calves were sired by the same bull, there was not a clear mode of inheritance. Underlying nutritional deficiencies may also have contributed to the problem, prompting the supplementation of calves with vitamin E and selenium at birth. This was the first case following the implementation of the supplementation programme. Marked submandibular oedema was evident at postmortem examination of the two-month-old Simmental calf. The pleural and abdominal cavity contained several litres of effusion and the lungs were large and heavy. The heart had a round shape (Fig 3) and excess pericardial fluid. The cardiac muscle was pale and soft. Spleen and liver parenchyma were firm, and the liver had a nutmeg pattern. Tissue biochemistry revealed a selenium value of 0.74 mg/kg DM (reference range 0.90 to 1.75 mg/kg) and vitamin E value of 3.67 µmol/kg fresh tissue (reference range >5 µmol/kg). Histopathology found evidence of chronic or progressive circulatory failure. There were widespread wavy and thinned cardiac myofibres; however, there were no lesions typical of nutritional myopathy despite the low selenium and vitamin E levels.

### Small ruminants

#### Nutritional and metabolic disorders

Inverness suspected iodine deficiency as the cause of stillbirth in a small number of blackface lambs in a hill flock. Affected

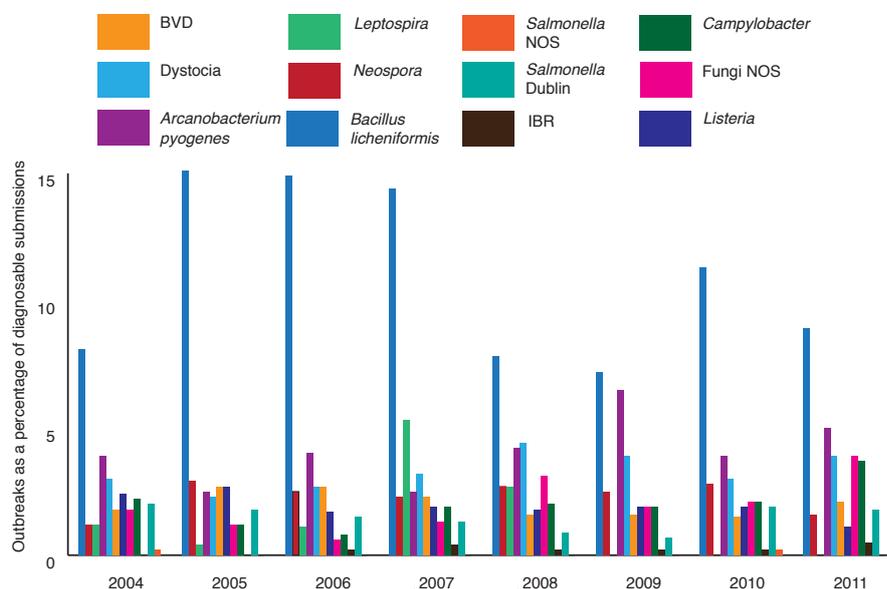


FIG 2: Bovine abortion diagnoses between 2004 and 2011

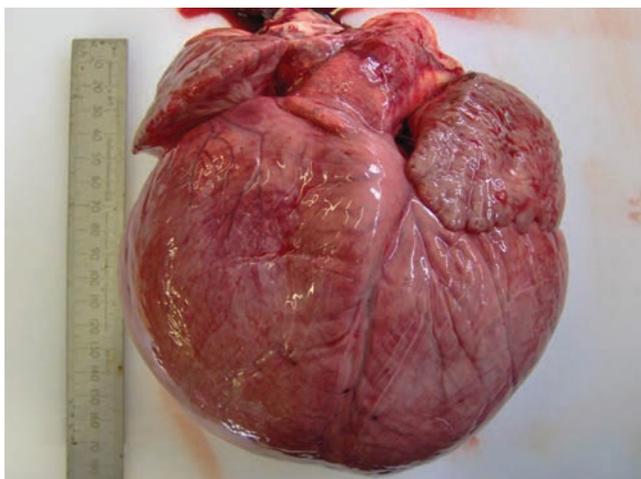


FIG 3: Heart from a calf with dilated cardiomyopathy



FIG 4: Lamb with ear loss following suspected transient vasoconstriction

lambs were born at term but were small with markedly short coats. Goitre was evident in one lamb submitted for postmortem examination. The enlarged thyroid weighed 26.4 g, giving a thyroid to bodyweight ratio of 13 g/kg (reference range <0.4 g/kg bodyweight). Thyroid tissue contained only 270 mg iodine/kg DM (reference range >1200 mg/kg DM). Histopathology confirmed dramatic thyroid hyperplasia and lack of colloid.

### Parasitic diseases

Nematodirosis was diagnosed on 35 occasions in June, a similar number to May. In 2011, 10 outbreaks were diagnosed in May and 28 outbreaks in June. In an outbreak in Aberdeenshire, 13 two-month-old lambs from a group of 1000 were found dead on a large organic sheep unit and 30 per cent were scouring. The pasture had been used to graze ewes and lambs for several years in succession. Grazing of cattle alongside sheep was used to aid parasite control and had previously appeared to be successful. Both lambs submitted for postmortem examination contained large numbers of *Nematodirus battus* worms in the small intestine.

### Generalised and systemic conditions

A seven-week-old Texel-cross lamb found laterally recumbent with extensor rigidity was submitted to Perth for postmortem examination. The group had been docked three weeks earlier and one other lamb was similarly affected. At postmortem examination, tail and scrotal wounds were noted but there were no other findings. Neuropathology did not detect any significant lesions and a presumptive diagnosis of tetanus was made based on the history and clinical signs. SAC C VS advised that flock vaccination with a multivalent clostridial vaccine should be considered.

Dumfries suspected tickborne fever (TBF) to be a predisposing factor in the deaths of 12 one-month-old single lambs within one week. Three lambs were

submitted for postmortem examination with diagnoses of enteritis, septicaemia due to *Mannheimia haemolytica*, and bilateral carpal joint infection being made, respectively. The most significant finding was the presence of large numbers of ticks on two of the lambs causing SAC C VS to suspect that immunosuppression due to TBF may have contributed to the losses.

Aberdeen diagnosed salmonellosis as the cause of death of a two-month-old lamb at grass. Clinical signs of severe depression and dehydration had been noted, but the lamb died before treatment could be administered. At postmortem examination the intestinal contents were liquid and moderate numbers of *Nematodirus battus* worms were observed in intestinal washings. *Salmonella* Kedougou was isolated in septicaemic distribution. This serovar of salmonella is most commonly isolated from poultry and less frequently from pigs. It has also been identified in feedstuffs. The source in this case was not identified and no other lambs were affected.

### Respiratory tract disorders

St Boswells isolated *Mannheimia haemolytica* from the pneumonic lungs of a greyface hogg and severe underlying ovine pulmonary adenocarcinoma (OPA) was confirmed histologically. There had been four deaths in the group of 100 hogs bought-in last September, although this was the first to be investigated. As there is no way of screening individual animals for OPA, and the main flock was thought to be free of infection, SAC C VS advised that the hogs should be managed as a separate group. Perth and Dumfries both diagnosed OPA in young tups which had been purchased in autumn 2011, further illustrating the potential for disease spread by animal movement.

### Nervous system disorders

Perth diagnosed Border disease as the cause of tremor in a group of neonatal lambs. Increased numbers of weak and stillborn

lambs were also reported. In surviving lambs the tremor appeared to abate with age. A blood sample from an affected lamb tested positive for Border disease antigen. Problems were confined to lambs born to a group of bought-in gimmers that was isolated from the main flock. This management decision both limited spread of infection and gave the options of either testing to identify further persistently infected animals or culling the whole group.

### Skin diseases

Transient vasoconstriction was proposed as the cause of ear loss in Suffolk-cross lambs. The lesions started at the base of the ear and either progressed across or around the margin until portions of one or both ears dropped off leaving a short, healing stump (Fig 4). The lambs were otherwise well. The pasture had been used for sheep in previous years, there were no horses or cattle in the field to chew the ears and no creep feeders that could cause trauma. No injections had been given, there was no evidence of *Salmonella* Dublin infection and the time of year and pathology were not consistent with ergotism. Skin biopsies submitted for histopathology revealed organising granulation tissue with no evidence of vasculitis or thrombosis to indicate infarction. Crystalline material was present in blood vessels in one of the four sections examined. A primary pathology was not identified. A similar problem was described in lambs in New Zealand that lost their ears and tails and developed a deep horizontal groove in their hooves. The New Zealand workers suggested that the damage was caused by a period of transient vasoconstriction, (Anon 1979). In the case reported to Edinburgh, no further lambs were affected after they were moved to another field. However, no cause for the suspected vasoconstriction was found.

St Boswells diagnosed caseous lymphadenitis in a group of two-year-old rams. All 10 animals presented with submandibular and parotid lymph

node abscesses, and *Corynebacterium pseudotuberculosis* was isolated in each case, illustrating the potential for infection to spread within management groups.

### Pigs Alimentary tract disorders

*Clostridium perfringens* type C infection was diagnosed as the cause of increased mortality and diarrhoea in neonatal piglets on an outdoor breeding unit. Over the previous three months there had been an estimated mortality of 10 per cent. The problem was perceived to affect only litters from gilts. Breeding females were vaccinated against *Escherichia coli*, porcine reproductive and respiratory syndrome (PRRS), parvovirus and erysipelas. Postmortem examination of five affected piglets revealed enteritis in each case accompanied by serosal congestion, oedema and emphysema. The toxin of *C perfringens* was present in small intestinal content from two piglets, while toxin was present in content from a third. Histopathology revealed necrotic villi heavily fringed with attached clostridia and colonisation of intestinal crypts, as well as the ulcerated intestinal surface with clostridial organisms.

Parasitism was diagnosed in a batch of slaughter pigs from a unit that experienced an increasing condemnation rate for lungs and livers. Condemned livers and lungs submitted to SAC C VS for examination displayed 'milk spot' lesions and multifocal demarcated lesions respectively. There was no evidence of any significant bacterial, mycoplasmal or viral infections affecting the pulmonary tissues. Histopathological changes were consistent with a parasitic insult in all cases, suggesting possible recent ascarid migration through these organs. The pigs came from a mixed farm with 50 to 60 breeding sows. Livers from fattening pigs started being rejected about a year previously and treatments with flubendazole initially reduced the condemnation rate. SAC C VS provided advice on parasite control and anthelmintic use.

### Respiratory tract diseases

Mixed infection with *Pasteurella multocida* and *Mycoplasma hyopneumoniae* was believed to be responsible for respiratory disease in a herd of finishing pigs. Approximately 10 per cent of 1300 animals on the holding showed respiratory signs and the mortality rate was 5 per cent. The pigs had been

vaccinated against pleuropneumonia for the previous two years. Postmortem examination of three, four-month-old gilts revealed a generalised fibrinous pleurisy and dark pink consolidation of the cranial lung lobes in two of the pigs. *P multocida* was isolated from the lung of one pig and *M hyopneumoniae* DNA was detected by PCR in a pooled sample of lung confirming the presence of enzootic pneumonia. There was no evidence of swine influenza virus involvement following PCR testing.

### Reproductive tract conditions

An investigation was carried out to identify the cause of an increase in aborted and stillborn piglets on an outdoor breeding unit over the previous month. About 30 piglets had been born dead and abortions were occurring up to three weeks before farrowing. Sows were vaccinated against PRRS, erysipelas, parvovirus, swine influenza and *E coli*. The unit was stocked with in-pig sows from another unit. A litter of aborted fetuses were submitted for postmortem examination. A *Pasteurella*-like organism was isolated from the placentas and also from the fetal stomach contents of the two fetuses from which samples were cultured. In each case it was as part of a mixed growth.

### Birds Poultry

Infectious laryngotracheitis was diagnosed in a group of free-range layers displaying coughing and sneezing. Postmortem examination of a bird that died revealed excess mucus in the sinuses and a haemorrhagic tracheitis. The lumen of the trachea was partially blocked by a yellow plug of purulent debris. Histopathological changes were consistent with the presumptive diagnosis.

### Gamebirds

Aspergillosis, due to *Aspergillus niger*, was diagnosed in a batch of 1800 two-week-old mallard ducklings submitted from a shooting estate. Increased mortality was present in one of three similarly stocked and managed rearing sheds. Dyspnoea was observed in two of four ducklings submitted alive. Postmortem examination revealed lung congestion, white specks in the airsacs and pericarditis in some birds. *A niger* was isolated from lung and liver of all four birds, and a monophasic Group B *Salmonella* was

isolated from pooled livers. Aspergillosis was considered to be the main problem but salmonellosis may have been a contributory factor.

Coccidiosis was diagnosed in several batches of pheasants and red-legged partridges that were aged from 18 days, and presented with a range of clinical signs. Pheasants tended to be dull, heat-seeking and of variable size. Increased mortality was more likely to be observed in partridges. Often the postmortem findings in pheasants were non-specific, but in partridges white cores in the caeca were frequently present. Combinations of coccidiosis and *Syngamus trachea* (gapeworms) were seen in pheasants and partridges, and also in a captive adult black grouse found dead in a breeding pen. SAC C VS suspected that the wet weather conditions may have increased the challenge from coccidia and gapeworms.

A diagnosis of rotavirus infection was eventually made in a batch of pheasant chicks aged seven days that had started to feed and then stopped again. Initial investigations failed to identify a cause. However, when further birds were submitted several had distention of the caeca with yellow fluid contents. Rotavirus was subsequently demonstrated by polyacrylamide gel electrophoresis in the caecal contents of the three birds tested. SAC C VS has noted on previous occasions that 'delayed starve-outs' can be a prelude to a diagnosis of rotavirus infection.

### Racing pigeons

Pigeon paramyxovirus 1 (PPMV-1) was diagnosed in a young racing pigeon aged three months that was submitted from a loft where several young birds had green watery faeces and some showed ataxia. The birds had not been vaccinated against PPMV-1. Subsequent serology and virology confirmed the diagnosis of PPMV-1 infection in the loft and the Divisional Veterinary Manager of the AHVLA was informed.

### Miscellaneous species Deer

Johne's disease was diagnosed in a farmed, four-year-old, female fallow deer which had scoured and very rapidly lost condition before death.

Postmortem examination confirmed the poor condition, and the mucosa of the ileum appeared thickened and corrugated. Acid/alcohol-fast bacilli typical of *Mycobacterium avium* subspecies *paratuberculosis* were found on a modified Ziehl-Neelsen smear prepared from the ileum.

### References

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HEPPLER, S., WATKINS, G. & CRAWSHAW, T. (2010) Risks to cattle transported long distances in late pregnancy. *Veterinary Record* 167, 796