Unusual cases of Blackleg
Mycotic abortion in pigs
Seabird die-off

CATTLE

Systemic disease
Bovine neonatal pancytopenia (BNP) was identified at Shrewsbury in four calves from three farms. This included two suckler calves aged 12 days and 15 days from a herd of 120 Simmental and Simmental-cross cows in which disease had not previously occurred. The two calves presented with typical clinical signs, the farmer noticing bleeding from the ears of each, and when clinically examined there was petechiation of the sclera and oral mucous membranes, with haemorrhage from the anus. Widespread haemorrhages were evident at postmortem examination, and histopathological examination of the bone marrow identified trilineage hypoplasia which is characteristic of BNP. Several other farms had similarly had their first cases of BNP, having none previously, and this indicates the potential for the disease to arise in calves born to cows which had been vaccinated several years previously.

Lead poisoning: A major outbreak of lead poisoning was diagnosed at Shrewsbury in a group of 20 housed suckler cows. Over a four day period, 17 of the cattle exhibited blindness, fitting and recumbency and died despite various treatments. Three of the cattle in the group survived and biochemical analysis of blood samples indicated elevated lead concentrations, confirming exposure. At the time of the outbreak the cattle were being fed purchased silage and the onset of disease over such a short period indicated the likely source of the lead being a recently-introduced silage bale. Postmortem examination of one of the cows identified chewed battery plate remnants within the reticulum and lead poisoning was confirmed by biochemical analysis of the kidney. Further examinations were undertaken by the practitioner on three other cows, with similar findings. The farmer agreed not to send the surviving cows for slaughter, in order to protect the food chain, until their blood lead concentrations fell to below the concentration considered to be indicative of unavoidable environmental exposure.
**Diseases of the alimentary tract**

Severe haemorrhagic abomasitis was diagnosed at Shrewsbury in a Bazadaise suckler calf. The calf, which was aged four to five days, had exhibited diarrhoea for a period of 24 hours, and then developed dysentery. It died on its way to be examined by the practitioner who immediately undertook a postmortem examination. The abomasal mucosa was severely haemorrhagic and inflamed (Figure 1) and there was bloody liquid and clots in the abomasal lumen. Peri-renal oedema and petechiation of the endocardium and epicardium were also present. Fresh and fixed samples of the abomasum were submitted for laboratory examination. Only commensal organisms were isolated in anaerobic culture but histopathology confirmed a severe acute haemorrhagic abomasitis with intra-lesional Gram-positive bacteria which showed typical morphology of *Clostridium sordellii*. AHVLA comments that *C. sordellii* has been reported as a cause of abomasitis in lambs (Lewis and Naylor 1998) and similar cases have since been diagnosed in calves. The underlying reason for the disease is uncertain as the bacteria are environmental, and although an overload of fermentable carbohydrate has been proposed for animals being fed concentrate, this clearly does not explain its occurrence in neonatal animals. Vaccination has been employed on some farms to control the disease.

Figure 1: Haemorrhagic abomasitis in a young calf

**Blackleg:** Outbreaks of clostridial myositis or ‘blackleg’ caused by *Clostridium chauvoei* were reported by Carmarthen, Leahunst and Starcross, and unusually, in each there were lesions present in the heart and/or pericardium of the animals examined postmortem. In the first case three of a group of 33 calves aged six to seven months were found dead. One other animal was reported to be lame. In the second outbreak five of a group of 38 cattle which were aged between eight and 16 months died after escaping from 25 acres of parkland into a neighbour’s field, where cases of clostridial myositis were known to have occurred in the past. The third case was diagnosed in a group of 20 housed yearling bulls. Severe abdominal pain, malaise and recumbency were reported with the deaths of four occurring within 48-72 hours. There was similar pathology in each case with a fibrinous pericardial exudate (figure 2) and foci of blackening within the myocardium. Fluorescent antibody testing for *Clostridium chauvoei* on the heart muscle lesions was diagnostic. None of the animals in the outbreaks had been vaccinated, which was recommended for disease control.

Figure 2: Fibrinous pericardial exudate and focal myocardial blackening associated with *Clostridiun chauvoei*

The occurrence of lesions in the heart and pericardium with infection by *C. chauvoei* was first described in cattle examined postmortem in Northern Ireland (Malone and others 1986). Lesions can also occur in skeletal muscle of the limbs, trunk, skull and diaphragm, and in the tongue and the mesentery.
The disease can occur throughout the year although most cases diagnosed by AHVLA in England and Wales are in the summer months.

SMALL RUMINANTS

Renal disease

Drunken Lamb Syndrome: A three week old lamb was submitted to Carmarthen from a flock where lambs appeared drunk and unable to stand. Cryptosporidiosis had been diagnosed on the farm previously. Postmortem examination revealed yellow faecal staining around the perineum and both kidneys appeared enlarged with pale renal cortices. Aqueous humour was used to measure urea which was raised at 63.37 mmol/l and Cryptosporidium oocysts were detected by microscopy of faeces. Ocular fluid analysis of urea is considered a useful indicator of acute or chronic renal failure leading to uraemia for example in chronic parasitic gastroenteritis and nephrosis in lambs. Values for aqueous humour -urea >30 mmol/l (in ruminants) are consistent with significant nephropathy but histopathology is essential for a definitive diagnosis. Advice was provided on hygiene and the zoonotic potential of Cryptosporidium.

The mechanism of nephrosis is not well understood but it can be seen in lambs following diarrhoea. Angell and others (2013 a,b) have described the pathophysiology and possible treatment for lambs with nephrosis and the incidence of nephrosis in lambs across GB is shown in fig 3.

Fig 3: GB incidents of nephrosis in sheep as % of diagnosable submissions

Mammary disease
Mastitis: An adult ewe was submitted to Penrith from a mixed flock of several hundred Mules and Swaledales. From a group of 103 Mules, about 80 had been similarly affected with apparent agalactia/mastitis/failure of milk let-down. Lambs appeared to feed for the first 24 hours after birth but then appeared hungry and required supplementary feeding. The affected ewes were all reported to be in good bodily condition. The degree of udder abnormality varied from ewe to ewe, some appeared uniformly hard, others lumpy and some with small lumps on the rear upper udder. Several had lumps of varying size in the supramammary lymph node. The udder of the ewe submitted to Penrith for examination appeared uniformly firm on both sides with no obvious focal lesions and the milk within the glands appeared to be of normal colour and consistency. Affected ewes had all been treated with a dry cow preparation at ½ tube per quarter. Only a small percentage of the flock was treated in this way and only treated ewes lambed down with this condition.

Histopathology revealed plasmalymphocytic and histiocytic mastitis, probably long-standing. Investigations are on-going but the link with administration of dry cow tubes appears highly significant. These products are not licensed in sheep, nor designed for sheep teats and require high standards of hygiene in their administration.

Reproductive disease

Suspected teratogenetic disease: Complex congenital abnormalities affecting 12 lambs in a single group, all sired by the same ram, prompted submission of a typical case. A previous case had been examined and no evidence of Border disease virus (BDV), Schmallenberg virus (SBV) or other infectious aetiology was identified. The lamb had undescended testes, brachygnathia, flexion of the tarsal joints with reduced range of movement, kinked tail, cleft palate, massive distension of the large intestines with viscous fluid, hydronephrotic left kidney and hypoplastic right kidney. The brain was unremarkable. Testing for SBV and BDV by PCR was negative. Further discussion with the farm veterinarian raised the possibility of albendazole administration during the critical period (14 - 24 days’ gestation). This benzimidazole anthelmintic has been associated with the type of abnormalities seen in this case. Increasingly there are flocks that have either confirmed or suspected resistance of liver fluke parasites to triclabendazole. This has prompted shepherds to use alternative flukicides including albendazole. Although datasheets clearly indicate avoiding dosing ewes at the higher ‘fluke and worm’ dose during tupping and for one month after removing rams, many farmers may be unaware of the risk of congenital deformities associated with this anthelmintic.

Systemic disease

Dog worrying and associated disease: An adult ewe was submitted for postmortem examination and an aborted fetus to aid investigation into widespread malaise in a group 60 sheep that had been worried by a dog two weeks previously. Five deaths and cases of twin lamb disease, hypocalcaemia, abortions and the delivery of weak lambs had followed the incident. The group had wintered out but was housed following the attack.
No other health issues had been noted in the rest of the flock. While pasturellosis was suspected, the gross pathology in this carcass was advancing autolysis of the major organs and haemorrhage most notably in the respiratory tract and abomasum, consistent with a terminal episode of toxaemia or septicaemia and giving rise to the suspicion of clostridial disease. The bacteriology findings corroborated that this ewe died as a result of *Clostridium sordellii* abomasitis.

The stress of the dog attack and the change of management and diet by the move inside could account for the variety of issues seen in this flock and demonstrates the extent of the effect dog worrying can have.

The Farmers Guardian has launched a “Take the Lead” campaign; a downloadable poster is available here.  

**PIGS**

**Reproductive disease**

**Fungal cause of abortions and weak neonates:** Fungal disease was diagnosed when weak neonatal and aborted piglets were submitted to Bury St Edmunds from two of four sows affected on a 1,000 sow outdoor breeding unit. The four sows were from different parities and were well and in good body condition. This was the first batch affected in this way, although the last few batches of sows to farrow had significantly reduced litter sizes. There were no significant foetal lesions visible grossly but the two placentas submitted appeared thickened and wrinkled with focal haemorrhage, and as shown in Figure 4. *Aspergillus fumigatus* was isolated from several foetal stomach contents and from the placentas and histopathology supported these culture findings with lesions of a mycotic placentitis and a purulent bronchopneumonia in one piglet as a likely sequel to the fungal infection. An environmental source of infection was suspected with bedding or stacked straw being possible sources.

Figure 4: Placental thickening associated with mycotic placentitis
Bacterial placentitis causes abortion: An unusual diagnosis of bacterial placentitis due to *Bacillus* species was suspected by Bury St Edmunds to be the cause of abortion on an outdoor breeding unit. Two sows had aborted from a batch of 90 13-weeks in-pig. The aborted foetus was from a gilt. The problem of around two abortions per farrowing batch had occurred in the last three batches and around the same time. Normal numbers of live piglets were being delivered with a slight increase in still-births, and mummies were rare. Piglet viability was good although there has been long-term variation in piglet size within litters, possibly due to larger litter sizes. No other problems were reported on the unit or rearing farms it supplied. There was gross evidence of reddening and thickening in the placentas not dissimilar to that seen in the case of fungal placentitis described above but profuse growths of both *Streptococcus porcinus* and *Bacillus* species were obtained from three placentas with no fungal growth. Histopathology confirmed a bacterial placentitis and the morphology of the organisms associated with the lesions suggested that the *Bacillus* species was most likely to be the significant organism. No other infectious agents of abortion were detected.

**Alimentary Disease**

**First swine dysentery outbreak diagnosed in East Anglian region since 2012:** Swine dysentery was confirmed on a breeder-finisher unit when two live 12-week-old pigs were submitted to Bury St Edmunds to investigate diarrhoea in approximately 50% of 10 to 12-week-old pigs in strawed pens with no deaths. Mucus and, in just two faeces, blood flecks had been noted in the diarrhoea on farm. Diarrhoea was first noticed in finishing pigs and was reported to have been on-going for approximately six to eight weeks. A scrape-through system was operated on the unit. The two untreated pigs were submitted live with grey-green diarrhoea. In one, the large intestine was thickened and the mucosa reddened along its entire length with accumulations of mucus adherent to the mucosa (Figure 5), raising a suspicion of colitis due to *Brachyspira* species. The colon of the second pig showed thickening of the colon with a pale mucosa and no mucus visible.
Brachyspira hyodsenteriae was isolated from both pigs and was detected by PCR.

Figure 5: Mucoid colitis in this case of swine dysentery

The B. hyodsenteriae isolate was found to be sensitive to tiamulin. AHVLA made no diagnoses of swine dysentery in East Anglia in 2013 and only one, in smallholder pigs, in 2012. More information is available on swine dysentery from BPEX on the following link: www.bpex.org.uk/2TS/health/swinedysentery.aspx

Systemic Disease

Enteric disease and deaths due to porcine circovirus-2 associated disease: Two pigs aged 10 and 13-weeks were submitted to Shrewsbury to investigate the cause of diarrhoea and increased sudden deaths on a 300-sow breeder-finisher unit. The farm had previously vaccinated weaners for PCV2 but stopped about two years ago. Six pigs had died within a three-week period. The younger submitted pig was markedly diarrhoeic and had minor lung consolidation. Histopathology and immunohistochemistry confirmed porcine circovirus-2 (PCV-2) associated disease (PCVAD) and this was considered the primary cause of disease and death in this pig. The older
pig had enlarged, pale, firm kidneys with fine petechiation over the kidney cortices. Histopathology confirmed a severe glomerulo-nephritis, with pathology typical of porcine dermatitis and nephropathy syndrome (PDNS), likely to be associated with the PCVAD occurring on farm. Since obtaining the diagnosis, the farm has started vaccinating weaners for PCV2 again.

**Nervous disease**

**Oedema disease outbreak in weaners with meningitis-like signs:** Six-week-old pigs were submitted to Thirsk to investigate nervous signs and mortality over a weekend not responding to treatment for suspected meningitis. Affected pigs were reported to have sudden onset eyelid swelling and a proportion then developed meningitis-like signs. The indoor unit operated a single source batch system with pigs entering every five weeks. Two of the pigs were in lateral recumbency and paddling with nystagmus and slightly swollen eyelids. Postmortem examination revealed subtle subcutaneous oedema, a wet appearance to subcutaneous tissues and oedema of the mesocolon in two of the pigs. None of the pigs were pyrexic which, together with the clinical history and gross findings, supported a suspicion of oedema disease due to *E. coli* rather than a bacterial meningitis. Haemolytic *E. coli* (serotype 0139:K82, strain E4) was isolated from small intestinal contents from an untreated pig with marked signs. This strain can be associated with both enteric disease and oedema disease in pigs.

Figure 6: Swollen eyelid in piglet with oedema disease
Histopathological examination of two brains revealed oedema and an associated encephalopathy supporting the diagnosis of oedema disease. PRRS genotype 1 (European strain) was also detected in pooled sera from these pigs. There has been an increasing trend in oedema disease as a cause of porcine nervous disease in AHVLA submissions over the last 12 months and it is worth bearing in mind the possibility of oedema disease even when oedema of the subcutis or organs is absent. Bacterial meningitis (mainly due to *Streptococcus suis*, some due to *Haemophilus parasuis*) remains the predominant AHVLA diagnosis in porcine nervous disease in the 12 months to end of March 2014, with water deprivation, oedema disease, middle ear disease, brain abscessation and porcine sapelovirus infection making up most of the remainder of the diagnoses.

**BIRDS**

**Commercial Layers**

**Coccidiosis in pullets:** Haemorrhagic typhlitis due to caecal coccidiosis was seen in a house of 35-day-old layer pullets with a history of slight increase in mortality. Postmortem examination revealed moderately dehydrated carcases with mild pallor and swelling of the kidneys and abnormal, floccular-caseous blood tinged contents in the caeca, lower ileum and rectum. Wet smear examination of blood tinged luminal contents revealed large numbers of coccidial forms with a lesion distribution consistent with that of *Eimeria tenella*. This was an unexpected finding and further enquiries failed to reveal a reason for a breakdown in coccidial vaccine protection.

**Broilers & Broiler Breeders**

**Inclusion body hepatitis:** Inclusion body hepatitis (IBH) was seen in a submission of 9-day-old chicks with a history of high mortality. Enlarged, pale and marbled livers were the main necropsy finding. Histological examination of the affected livers revealed multiple foci of acute degeneration and necrosis.
accompanied by numerous degenerate hepatocytes containing large solid basophilic intranuclear inclusion bodies consistent with hepatitis associated with avian adenovirus infection (IBH).

**Marek's disease:** A flock of 2500 free-range broiler chickens currently aged between eight and fourteen weeks had experienced poor performance in several batches of birds over a two to three month period. Four birds underwent postmortem examination, of which one had urate deposition over the liver and pericardium (visceral gout), pale kidneys and an enlarged pale spleen. Histological examination of tissues from this bird confirmed a non-suppurative encephalitis and lymphomatous changes in the spleen consistent with Marek's disease. Infectious bronchitis virus was detected by PCR testing of kidney tissue, but sequencing showed 100% similarity with a recognized vaccine strain.

**Ducks and Geese**

**Amyloidosis:** An adult male Indian Runner duck was noted to be unwell, died on the journey to the private veterinary surgeon and was submitted for postmortem examination. The duck was in a fair to poor body condition and the initial striking post mortem finding was a markedly enlarged liver, which was slightly pale and firm. Its appearance was suspicious of amyloidosis. Amyloidosis due to the deposition of amyloid A is a well-recognised pathological disorder in ducks that can be an important cause of death. The disease is often associated with chronic bacterial infections and is sometimes found in association with vegetative endocarditis, as in this case where large vegetative lesions were detected on the mitral valves in the heart. An organism phenotypically consistent with *Streptococcus gallolyticus* was isolated from the spleen in pure culture, and may have been of significance in this case.

**Backyard flocks**

**Fatty liver and haemorrhage:** Fatty liver and haemorrhage were diagnosed as the cause of death of a four year old layer hen submitted to Carmarthen. It was the only one to die from a backyard flock of 14 hens plus a cockerel. It did not show any prior clinical signs before being found dead. At postmortem examination all tissues were pale. There was a large amount of fat in the body cavity and the liver was enlarged, a golden yellow colour and 75% of the right
lobe was dark red and firm, with an associated large blood clot. Histopathology confirmed diffuse fatty infiltration in the liver with evidence of acute haemorrhage, but no evidence of neoplasia. Increased fragility of the liver associated with a high fat content are thought to predispose to ruptures and tears, sometimes with fatal haemorrhage.

**Infectious laryngotracheitis:** Samples were received from an on-farm necropsy of a two-year-old chicken with respiratory disease. The bird was from a small backyard flock with no vaccinations used. Gross pathological changes had been noted in the trachea and larynx with a necrotic plug in the proximal trachea. Bacteriology was unremarkable and histology was undertaken. The histological findings in the trachea were suggestive of infectious laryngotracheitis (ILT) although the inclusion bodies diagnostic of this disease were not seen, as a result of the chronicity of the lesions.

**Game birds**

**Salmonellosis in partridges:** *Salmonella* Typhimurium infection was diagnosed as the cause of increased illthrift, abnormal yellow frothy droppings and mortality in a flock of 11-day-old partridge chicks. Postmortem examination revealed enlargement of the spleen and liver, the latter with greenish discoloration, and dilatation of the caeca with yellow caseous material. Bacterial culture undertaken on the liver, spleen and caeca yielded *S. Typhimurium*, which is recognized as a potential cause of high mortality in young partridges.

**WILDLIFE**

**Seabird die-off:** Several submissions comprising 27 seabirds including razorbills (*Alca torda*) and guillemots (*Uria aalge*) from tide-line wrecks in South-west England and Wales were received at AHVLA regional laboratories. Collaborative work between the Royal Society for the Protection of Birds (RSPB), several different agencies (in the UK and France) and the AHVLA, has now resulted in a report which estimated that between December 2013 and early March 2014, 33,600 seabirds died and were washed up on beaches. Starvation, thought to be associated with almost continual stormy weather over these months, was the primary finding; however, a very small percentage of the birds showed signs of pollution. PIBs (polyisobutylenes) were not thought to be involved in this incident and Avian Influenza virus was not isolated. A significant seabird wreck also associated with stormy weather occurred in March 2013 along the East coasts of England and Scotland (*VR 2013, 173, p.224*). A report for February 2014 from the Met Office [http://www.metoffice.gov.uk/media/pdf/n/i/Recent_Storms_Briefing_Final_07023.pdf](http://www.metoffice.gov.uk/media/pdf/n/i/Recent_Storms_Briefing_Final_07023.pdf) indicated that the UK was affected by an exceptional, record breaking, run of winter storms. This period of weather has been part of a major
perturbation to the Pacific and Atlantic jet streams driven in part by persistent rainfall over the tropical West Pacific. If weather patterns change, and more extreme weather occurs (storms of greater intensity and longer duration) these seabird wrecks may become more frequent. The precise reason that storms prevent the birds feeding on fish is not known.

Fig 8: An emaciated razorbill submitted to AHVLA Carmarthen; prolonged storms at sea appear to have been responsible for starvation in sea birds last winter

References


This summary is produced by the AHVLA and is drawn from reports provided at the time of reporting by the AHVLA laboratories at Aberystwyth, Bury St Edmunds, Carmarthen, Langford, Lasswade, Leahrurst, Newcastle, Penrith, Royal Veterinary College, Shrewsbury, Starcross, Sutton Bonington, Thirsk, Weybridge and Winchester. AHVLA monthly reports are available online at [http://www.defra.gov.uk/ahvla-en/category/publications/disease-surv/surv-reports/](http://www.defra.gov.uk/ahvla-en/category/publications/disease-surv/surv-reports/)