Post parturient haemoglobinuria with low blood phosphate concentrations diagnosed in a dairy herd

- *Streptococcus pluranimalium* implicated as the cause of abortion in a suckler cow
- Plant poisoning due to Annual Mercury recorded in sheep at pasture in Kent
- Congenital tremor type A2 diagnosed on two farms in gilt litters
- *Brachyspira intermedia* infection implicated as cause of diarrhoea in free range laying hens
- Red squirrel deaths associated with pox virus disease, adenovirus enteritis and pediculosis
- *Cotoneaster* poisoning diagnosed in an alpaca

### CATTLE

**Reproductive disease**

Neosporosis was again the most commonly diagnosed cause of bovine abortion. Langford investigated an outbreak in what was probably a previously naïve dairy herd. Eleven cows had aborted and four fetuses were submitted for examination. All four were seropositive to *Neospora caninum* and had non-suppurative encephalitis suggestive of *N. caninum* infection. This was confirmed by immunohistochemistry on the brain of one.

Thirsk diagnosed abortion due to *Streptococcus pluranimalium*, by culture in pure growth from the placenta of a suckler cow that aborted at approximately five months of gestation. The placenta was markedly oedematous with extensive reddening of the intercotyledonary areas and covered with yellow necrotic debris and pus (see figure). *Streptococcus pluranimalium* is a sporadic cause of abortion in a range of species, and apart from general hygiene measures, there are no specific guidelines to prevent this type of abortion.

Many Regional Laboratories diagnosed cases of fungal abortion. Most were sporadic but on one dairy farm in which *Aspergillus* species was diagnosed, four of 140 cows had aborted during a two week period.

A rare diagnosis of abortion due to Bovine Herpes Virus–1 (BoHV-1) - the cause of infectious bovine rhinotracheitis - was made by Shrewsbury. Three abortions had occurred in the 120 cow dairy herd and necrotising hepatitis was detected by histopathology in the single fetus submitted, and BoHV-1 was detected by immunohistochemistry.
**Enteric disease**

Starcross diagnosed abomasitis associated with *Sarcina*-like bacteria in a ten day old calf that died with no detected preceding signs. Ten other calves of similar age had died recently. Calves were fed a mixture of powdered and waste milk once daily with access to concentrates and straw. Necropsy revealed a severely tympanic abomasum with emphysematous plicae and areas of mucosal congestion and widespread congestion of the small intestines. Tests for salmonellae and clostridial toxins proved negative. Histopathology of the abomasum confirmed the presence of an emphysematous and haemorrhagic abomasitis associated with small numbers of *Sarcina*-like bacteria. Abomasal bloat involving these bacteria has been described by Edwards & others (2008).

Winchester investigated diarrhoea in young calves in a 200 cow dairy herd by the investigation of four faecal samples. Rotavirus was detected by ELISA testing in two calves, but all four samples were positive for Group B *Salmonella*, serotyped as a monophasic strain of *Salmonella* Typhimurium PT 193. Monophasic strains have recently become increasingly common in livestock and, like many strains of *Salmonella* Typhimurium, cause enteritis and septicaemia in calves and adult cattle; while involvement in abortion is unusual. The pathogenic effects of *S. Typhimurium* in the calves would probably have been exacerbated by co-infection with rotavirus.

Coccidiosis was commonly diagnosed in older calves. Langford made eight diagnoses; affected calves were between six weeks and five months of age. Diarrhoea was consistently reported, some with blood, and two cases also reported weight loss and malaise. Morbidity was between 20 and 50 per cent. Coccidial oocysts counts ranged from 1,450 to 32,000 oocysts / gram.

**Respiratory disease**

Both Bury and Shrewsbury diagnosed Respiratory Syncytial Virus (RSV) infection this month, in adult cattle and calves respectively. Bury identified RSV by fluorescent antibody test in nasal swabs from two dairy cows that developed acute pyrexia and nasal discharge with distinct lung sounds reported on chest auscultation. This, along with drop in milk yield, is typical of the signs of RSV infection in adult cattle. Shrewsbury identified RSV infection by immunohistochemistry in a six month old calf from a fattening unit. Three animals were found dead at pasture.

**Other diseases**

Langford investigated a fatal case of haemoglobinuria and jaundice in a cow, three to four weeks after calving, in a 200 cow dairy herd. The phosphate concentration in the plasma of four post parturient cows was significantly below the reference range and other potential causes of jaundice were ruled out; leading to a likely diagnosis of post parturient haemoglobinuria. The sole feed was whole-crop maize silage, which is likely to provide insufficient phosphorus for the requirements of dairy cows. Monocalcium phosphate was added to the ration; two weeks later the plasma phosphate concentration was within the normal range.

Babesiosis was diagnosed by Langford in an adult dairy cow as the cause of haematuria. The cow also had weight loss, diarrhoea, metritis and pyrexia. Five cows in the group of 25 developed haematuria, two of which died.

**Urine discolouration**

Starcross investigated an unusual phenomenon (rather than a disease): red-brown-orange urine discolouration approximately five minutes after micturition was noted in approximately 20% of a 100 cow dairy herd. The cows were clinically well, but some affected animals reportedly showed a mild drop in milk yield. The cows had been housed for the previous three weeks and fed a total metabolic ration and a commercial concentrate in the parlour. A new batch of the latter had been delivered three days before the onset of discolouration. Blood and urine samples were submitted from four animals. The urine was a distinct orange-brown colour with an alkaline pH (normal). On addition of an acid the orange discolouration disappeared. Investigations are on-going, including mass spectrometry of the urine, in an attempt to identify the compound involved. Similar cases were described in the UK during the 1970s, and also in Australia; however no definitive cause has ever been identified.
SMALL RUMINANTS

Reproductive diseases

A few submissions were received to investigate abortions in early lambing flocks. Luddington and Preston diagnosed toxoplasmosis and Starcross confirmed abortion due to *Listeria ivanovii* in an 18 month old ewe. The incident of toxoplasmosis investigated by Luddington involved a closed flock of 40 Dorset Horn ewes at full term. There was no history of abortions in previous seasons but this winter six abortions were reported over a two week period. Introduction of a vaccination policy was recommended in future years.

Alimentary tract diseases

Parasitic gastroenteritis was diagnosed by several regional laboratories as the mild weather continued in November. Luddington commented that many cases of parasitic gastro-enteritis were diagnosed in sheep and goats in November. Cases commonly occurred in 6-8-month-old lambs at grass, with counts ranging from 1300 to 7500 epg with clinical signs including wasting, diarrhoea and malaise.

Nervous diseases

Three submissions were received from a Suffolk flock in which a number of lambs sired by one ram had shown neurological signs including ataxia. Cerebral dysgenesis had been identified in a Suffolk ram lamb at Langford some months ago. Another lamb was submitted to Starcross where hydrocephalus was identified (not Dandy-Walker syndrome because the cerebellar vermis was unaffected). The sire of the lambs was subsequently submitted for post mortem examination to Langford at which a mild symmetrical hydrocephalus was identified. It was possible that the three sheep examined represented the spectrum of the same genetic disease but only detailed genetic analysis would be able to confirm this conclusively. The cerebral dysgenesis reported in the first case was not evident in the ram submitted to Langford and the lamb submitted to Starcross.

Botulism in ewes

Three ewes each in two groups of 150 at grass were reported to initially be going off their hind legs, progressing to sternal and then lateral recumbency. Five of these ewes died and four were submitted to Langford for necropsy. There were no significant gross findings following postmortem examination and histopathology of brain and spinal cord of two ewes was unremarkable. As litter from broiler units was stacked in the fields of the affected groups and no alternative causes of the clinical signs were identified botulism was considered the likely cause of disease. The two groups were immediately removed from the affected fields. The remaining live previously affected ewe, for food safety reasons, was placed under voluntary restriction for 18 days after the clinical signs ceased.

Musculoskeletal disease

*Erysipelothrix rhusiopathiae* was considered the likely cause of polyarthritis by both Penrith and Starcross after demonstration of high titres to *E. rhusiopathiae* in blood samples from affected lambs. In the incident investigated by Starcross 20 lambs in a batch of 1,000 were affected and in the high titres recorded in three lambs from a group of 4-month-old store lambs with a history of ill thrift and swollen joints in the incident investigated by Penrith.

Miscellaneous conditions

Annual mercury (*Mercurialis annua*) poisoning was diagnosed by Winchester in a group of 42 yearlings. A flock of yearlings that had been grazing marshland in Kent were moved in three separate groups to higher ground. The affected group had been moved to an old orchard, from which the trees had been removed. However five animals were later found dead in this field, on a single day, and a further animal was seen alive prior to death. Out of the six animals, five were noticed to have very pale mucous membranes and were jaundiced. The animals in the other groups which had been moved to other fields were not affected. Copper toxicity was discounted because plasma copper measurement in a live affected animal and liver and kidney copper measurements from a dead animal gave results within the reference range.
The live animal showed biochemical evidence of severe liver damage, with elevated liver enzymes and bilirubin. Histopathological examination revealed a severe periportal necrosis in the liver, and an acute tubulointerstitial nephritis in the kidney, relatively non-specific findings but suggestive of a possible toxic aetiology. Other causes of severe liver damage of this type include annual mercury (Mercurialis annua) poisoning, and a further examination of the field revealed that about a quarter of an acre of bare soil in the field had extensive growth of annual mercury, and plenty of plants were reported to have been chewed. Annual mercury is unusual in that it flowers in November and December and this outbreak was similar to a previous case investigated by Winchester in the 1990s, also in Kent. The haemolytic affect of annual mercury (and also the related woodland plant, dogs mercury) is attributable to a saponin, one of several toxic factors present in the plant.

PIGS

**Reproductive Disease**

*Stillbirths and mummification of piglets due to porcine parvovirus*

Fifteen sows had either aborted or produced dead piglets, out of a herd of 36 sows, since June 2011. The pigs were mainly housed but some sows were turned out during the summer. Four or five aborted at nine weeks gestation in June and then showed poor fertility. More recently, sows had farrowed at term but produced dead, sometimes mummified, piglets as well as some live piglets. No vaccines were used. A single mummified fetus examined at Carmarthen was positive for porcine parvovirus by PCR on fetal liver and heart. Three sows that produced dead pigs were seropositive for porcine parvovirus and seronegative for PRRS. Porcine parvovirus causes stillbirths and mummification but rarely causes abortion. It is likely that some of the reproductive disease reported was due to porcine parvovirus infection and the pattern of disease suggested the introduction of porcine parvovirus into a naive herd. Vaccination was advised to ensure all the breeding animals were immune.

**Respiratory Disease**

*Actinobacillus suis causing lung lesions typical of Actinobacillus pleuropneumoniae*

An unusual diagnosis of pleuropneumonia due to *Actinobacillus suis* was diagnosed in 13-week-old pigs on an indoor single-source nursery finisher. Respiratory disease with dyspnoea and increasing mortality was reported with 100 of 1,000 pigs affected and 30 deaths in the two weeks prior to submission. Post-mortem examination in both pigs revealed multifocal dark red to purple well-demarcated areas of consolidation with overlying fibrinous pleurisy affecting cranioventral and caudal lung fields. Affected areas were firm and raised, and the cut surfaces were dry and red-black. These gross lesions were suggestive of *Actinobacillus pleuropneumoniae* infection; however, *Actinobacillus suis* was isolated in pure and profuse growth from the lungs of both pigs. Histopathology revealed severe subacute to chronic necrotising haemorrhagic bronchointerstitial pneumonia typical of that described with *Actinobacillus pleuropneumoniae* infection, and also described in *Actinobacillus suis*. No viral involvement was detected.

**Systemic Disease & Miscellaneous**

*Coal tar poisoning due to clay pigeon remnants*

Coal tar poisoning following the ingestion of remnants of clay pigeons was diagnosed at Bury St Edmunds as the cause of four sudden deaths from a group of 35 replacement gilts in one paddock over a ten day period. Post-mortem examination of one gilt revealed yellow-tinged mucous membranes, sclera and subcutaneous connective tissues and a swollen mottled liver (see figure). The hepatopathy and jaundice raised the possibility of coal tar poisoning and farm staff found the clay pigeon remnants. The gilts had been placed on fresh ground and it came to light that clay pigeon shooting had taken place in the past, but was thought to be too long ago to be of concern. The pigs were for
breeding and not destined for the food chain; however, a voluntary 28 day period of restriction was agreed and the gilts were moved from the paddock.

**Nervous Disease**

**Congenital tremor type A2 in gilt litters**

Two outbreaks of congenital tremor type A2 were diagnosed, both involving piglets born to gilts. Type A2 is believed to be caused by a virus, as yet unidentified. In the first of these, 80% of gilt litters in the first affected batch showed congenital tremor. In each affected litter, the number of piglets showing signs varied from two to the whole litter; in the majority most of the litter was affected. The incidence of congenital tremor rapidly reduced in the four days following farrowing to approximately 20% as piglets recovered rapidly. Most affected piglets survived with the worst affected ones given colostral supplement. All three affected piglets submitted had a constant rhythmic tremor, but were bright and able to stand and walk.

Gross lesions were unremarkable and histopathology with special stains for myelin revealed clinically significant central hypomyelination typical of porcine congenital tremor type A2. In one pig, there was a mild myelin deficit which was reflected in its milder clinical signs. The veterinary surgeon attending the unit reported that litters in the following batch of gilts were also affected, but in the third batch none were affected. Interestingly, gilts in the first affected batch were also the first onto a new gilt mating unit and were kept in a scrape-through system pre and post-service. Later unaffected batches would have been exposed to manure from older gilts and thus able to acclimatise, unlike the first batches.

In the second outbreak, pigs were submitted from a nursery unit after weaning when they were noted to have a rhythmic bouncing tremor, sufficiently severe in one piglet for its hindlimbs to leave the ground. Again, the pigs were bright and alert. Further investigation revealed that some piglets born to gilts at the source breeding unit had been affected with congenital tremor and that these were persistent cases, most piglets having recovered by weaning.

Central spinal hypomyelination consistent with porcine congenital tremor A2 was identified; however, there was also mild non-suppurative panencephalitis which is unusual and merited further testing to rule out ruminant pestivirus involvement. Further investigation is in progress; however, it is thought likely that these lesions reflect the healing process; it is uncommon for us to examine piglets at this age affected with congenital tremor. Reports from the rearing unit indicated that other piglets arriving with congenital tremor had recovered within a week.

**BIRDS**

**Commercial Layers**

*Brachyspira intermedia*

Avian intestinal spirochaetosis was tentatively diagnosed in a group of 1,000 free-range layer hens aged 24-weeks, part of a much larger multi-age flock. The birds presented with declining egg production and weight loss. Loose droppings with a “skimmed milk” appearance were described. Initially mortality was not a feature, but it increased as dehydration predisposed to visceral gout, affecting those birds most severely debilitated. *Brachyspira intermedia* was isolated following anaerobic cultures of pooled caeca.

**Broilers & Broiler Breeders**

**Infectious Bronchitis**

Evidence of Infectious Bronchitis Virus (IBV) infection was detected by real time RT-PCR testing of pooled tracheal swabs in several broiler flocks aged between 22 and 50 days. Partial S1 gene sequencing identified European QX-like IBV infection in a number of these flocks with associated problems respectively including poor performance, *E. coli* septicaemia, wet droppings and increased rejections at processing due to airsac lesions. Furthermore, in one 32-day-old broiler flock there was a rising mortality to 0.8% per day with a history of birds being found dead.
Turkeys

Erysipelas
Familiar seasonal diagnoses were recorded in flocks of turkeys over 10-weeks of age being reared for the Christmas market. Commonly, sporadic sudden deaths were reported in affected flocks over a period of 1-2 weeks prompting laboratory investigations. At necropsy, lesions consistent with bacterial septicaemia were evident in birds from some of these flocks and *Erysipelothrix rhusiopathiae* was frequently isolated from tissues confirming a diagnosis of Erysipelas. Interestingly, in one flock incomplete (single dose) Erysipelas vaccination had been administered one month prior to the onset of losses and historically pigs had been kept on the unit.

Blackhead
Eight of a group of 50 turkeys aged 14-weeks had died and some were showing unusual yellow droppings and dullness for 2-3 days before death. At post-mortem examination, characteristic gross changes of Blackhead (Histomonosis) were seen including multiple circular yellow necrotic hepatic ‘target’ lesions with distension, thickening and necrosis of the caeca. Histopathology confirmed chronic lymphohistocytic hepatitis and typhlitis with protozoal infection. The disease was diagnosed in several other Christmas-market rearing flocks where intermittent mortality over a 1-2 week periods was often reported.

Backyard flocks

Marek’s disease
Marek’s disease was diagnosed in backyard hens of varying ages from different flocks. Histories of ill-thrift and clinical signs of Classical Marek’s disease were reported, including unilateral wing droop. In some cases failure to respond to antimicrobial, anticoccidial and anthelmintic treatment were also reported prior to submission. Consistent necropsy findings included marked splenomegaly and multifocal 2-5mm whitish nodular infiltrative visceral lesions. Histopathological examination confirmed the presence of pleomorphic lymphocytic infiltrates in affected viscera, typical of Marek’s disease.

Game birds

*Heterakis isolonche*
One dead pheasant from a group of 18 was submitted to investigate the cause of loose faeces following the introduction of three pheasants ten days previously. The birds had been wormed shortly before the addition of the new poults in September. At necropsy of the casualty poult the caeca were markedly distended with khaki-coloured contents and there were slightly raised, firm, 2mm nodular lesions over the caecal mucosa. Histopathological examination identified the changes as chronic proliferative typhlitis and the presence of nematode parasites confirmed this typhlitis as being consistent with *Heterakis isolonche* infection. This species is pathogenic in pheasants causing diarrhoea, weight loss and death and the condition has been rarely seen by AHVLA in recent years. However, suspected *Heterakis isolonche* typhlitis was also reported by AHVLA earlier in the 2011 rearing season affecting 8-week-old pheasant poultis on a different site.

WILDLIFE

Necropsy of a young brown hare (*Lepus europaeus*) from an estate where there had been a high mortality of hares revealed a single subcapsular nodule approximately 3mm x 2mm in the liver. Histopathology of the liver lesion indicated that it was due to coccidial infection – probably *Eimeria stiedae* which is less clinically significant in hares than in rabbits. White foci approximately 2mm in diameter were seen throughout the small intestine. A fluid sample of rectal content had an estimated coccidial count of 62,400,000 oocysts/gram. A published review by Barlow & Ainsworth (2009) has reported that coccidiosis was the most common disease and cause of death in British brown hares.

Several wild red squirrels (*Sciurus vulgaris*) were submitted from across Northern England. The most frequent cause of death was trauma from various sources including vehicular collisions and predator attack. There were however two cases of squirrel pox virus disease (SQPVD), two cases of adenovirus enteritis and a single fatal anaemia caused by a very heavy infestation of lice. As in
previous cases examined by AHVLA, the fatal pediculosis was seen in a juvenile red squirrel; we have yet to identify the condition in adult animals.

**MISCELLANEOUS EXOTIC FARmed SPECIES**

A 6-month-old male alpaca died during the night after having been seen alive and well on the previous day. It was one of 9 males which had been moved to a field away from home a week earlier. Near where it was found dead were *Cotoneaster* sp. bushes and there was evidence of browsing on the branches, leaves and berries. A large amount of this material was found in the stomachs on necropsy. Pulmonary oedema and congestion and pericardial effusion were the main findings, as well as petechiation of mesenteric lymph nodes, thymus and lungs. Lymph nodes in the head and neck were oedematous and some were very congested. Venous blood was bright red and unclotted. The cause of death was presumed to have been cyanogenic glycoside toxicity from *Cotoneaster* sp. Prunasin is known to be present in the leaves and fruit, with amygdalin also in the berries. There is a published report of the death of a llama from this cause (Grüss and Priymenko 2009).

**References**


This summary is produced by the AHVLA and is drawn from reports provided by the AHVLA laboratories at Aberystwyth, Bury St Edmunds, Carmarthen, Langford, Lasswade, Leahurst, Luddington, Newcastle, Penrith, Preston, Royal Veterinary College, Shrewsbury, Starcross, Sutton Bonington, Thirsk, Truro, Weybridge and Winchester. AHVLA monthly reports are available online at [http://vla.defra.gov.uk/reports/rep_surv](http://vla.defra.gov.uk/reports/rep_surv).