Idiopathic necrotising enteritis- cases continue

AHVLA Disease Surveillance Report
June 2014

- Idiopathic necrotising enteritis
- Polioencephalitis in lambs
- Colibacillosis in postweaned pigs
- Rotavirus in gamebirds

CATTLE

Respiratory disease

Infectious Bovine Rhinotracheitis: Leahurst investigated the deaths of thirteen Brown Swiss dairy heifer replacement calves which occurred over 10 days on a farm where 700 cows are milked. Stertor, drooling, dyspnoea with tongues extended, frothy salivation and pyrexia were reported, mostly in calves of less than a week of age. Four calves were examined post-mortem. There was fibrinonecrotic tracheitis and pleuropneumonia in addition to an erosive rumenitis, nephritis and diarrhoea. Small raised circular lesions were present on the tongue, soft palate, trachea and mucosa of the stomachs and the oesophagus. The liver of one calf was swollen with miliary white foci of the ventral left lobe. Although fluorescent antibody tests for IBR in tracheal mucosal samples were negative, BoHV-1 was identified using PCR in samples of lung, trachea and bronchi. The occurrence of lesions in such young calves is consistent with congenital or perinatal infection. In this case the calves were vaccinated with a modified live intranasal BoHV-1 vaccine, following which no new cases were seen.

Alimentary disease

Coccidiosis: Outbreaks of coccidiosis were diagnosed at Carmarthen and Shrewsbury in young animals which had been turned out to pasture. In one case a group of 120 three month old dairy calves was turned onto pasture in May with diarrhoea occurring within 2 weeks. They responded poorly to anticoccidial treatment with diarrhoea and ill thrift persisting in 30 of the group, six of which were housed for supportive treatment. One of the two faeces samples submitted from affected calves had a count of 14,700 oocysts per gram with 76% of the oocysts confirmed to be Eimeria alabamensis. In the
second case 12 weaned dairy heifers had been turned out one week previously onto a paddock where coccidiosis had been diagnosed in the past. Eight were reported to be scouring with a coccidial oocyst count of 3,865,000 per gram identified in a faeces sample. Although speciation of the coccidia was not undertaken, such a high oocyst count is strongly suspicious of *E. alabamensis* infection. *E. alabamensis* is a coccidian that parasitises the small and large intestinal mucosa and has a very short prepatent period of six to eleven days. Calves had been reared on the same pastures for several years on each of the farms. The exposure to the highly contaminated pastures is thought to have caused disease soon after turnout. AHVLA comments that these cases show the importance of environmental contamination and overwintering of oocysts, where naïve calves are turned onto the same pasture yearly. Treatment may be insufficient to prevent clinical or subclinical disease due to the high challenge. Avoiding using the pastures for young calves for at least the next two years should be considered.

**Idiopathic necrotising enteritis of suckler calves** (INESC) was diagnosed at Langford in a 3 month old suckled Devon calf, the only one affected in a group of 25 cows and spring-born calves in a 180 cow herd. It had a 2 day history of malaise and diarrhoea before it died. Postmortem examination by the practitioner revealed necrotic, diphtheritic foul-smelling ulcerative lesions on the tongue, larynx and the trachea (figure 1). There was also ulceration and thickening of the large intestinal mucosa and peritonitic inflammation of the small intestinal loops. Tests for BVDv infection, salmonellosis and coccidiosis were unrewarding and histological examination confirmed diphtheritic and necrotic glossitis and enteritis which was diagnostic of INESC.

![Fig 1: Diphtheritic ulcerative lesions in larynx and trachea of a 3-month-old calf](image)
INESC is typically seen in suckled two to three month old calves at grass though cases have been seen in younger calves and up to seven months of age. The condition was first described twenty years ago in Scotland (Penny and others 1994). Clinical signs are variable and range from some animals being found dead with no previous signs of illness, to other exhibiting a protracted period of malaise with diarrhoea. Most cases scour, though signs suggestive of pneumonia can also be seen. Haematological examination shows a severe non-regenerative neutropenia. The underlying aetiology of this condition is unknown.

**Systemic disease**

**Lymphoedema:** A two-and-a-half-year-old Aberdeen Angus-cross beast was euthanased following episodes over a period of 12 months when one forelimb and the brisket area became swollen. At the time of submission there was dramatic swelling of the entire right foreleg and right side of the brisket. At postmortem examination the swelling was found to consist of yellow stained oedema fluid which had accumulated in the subcutaneous tissues. No underlying abnormality or infection was identified. This was considered to be a case of lymphoedema of unknown aetiology. A form of congenital lymphoedema has been reported in Hereford, Ayrshire and Red Angus calves and is thought to have a genetic basis.

**SMALL RUMINANTS**

**Enteric disease**

**Nematodirus:** Incidents of parasitic gastroenteritis (PGE) due to *Nematodirus battus* were significantly reduced in 2014 compared to the previous two years (Figure 2). The second quarter of the year normally records the highest number of incidents of this disease in lambs in GB. It is likely that the weather in this quarter (warmer than average and April and June drier than average in all regions) meant that the mass hatch did not coincide with lambs taking sufficient grass. Awareness in the farming industry of *N. battus* is also likely to have been raised by the regional forecasts on the SCOPS website. AHVLA contributes information to this forecast. Incidents were however recorded by most regional laboratories over this period; occasionally *N. battus* was recorded together with other gastro-intestinal nematodes or in animals that died due to nephrosis.

Fig 2: Incidents of PGE due to *Nematodirus battus*
Neurological disease

Polioencephalitis of unknown cause: Langford and Leahurst both reported cases of polioencephalitis of unknown cause. In one case polioencephalitis was diagnosed in a 5-week-old lamb. Nervous signs including paresis and lateral recumbency, paddling, intention tremor and reduced patellar reflexes were seen in at least four lambs from this closed 170 ewe flock. Similar presentations have been seen in lambs as young as two weeks in previous years. Occasional lambs recover. Gross post mortem findings were unrewarding. Histopathological examination of the brain and spinal cord revealed a non suppurative polioencephalomyelitis. These lesions are typical of neurotropic viral infections including Louping ill virus. However, Louping ill was ruled out as Louping ill virus antigen was not detected by immunohistochemistry (IHC), and spinal ganglionitis was also present which is not a feature of Louping ill virus infection. Viral-type encephalitis of unknown cause is reported sporadically in submissions to AHVLA (up to 2 to 3 cases a year in sheep flocks); by extrapolation from findings in other species, possible causes include astroviruses and enteroviruses, but risk factors are not fully identified. It is therefore interesting that this closed farm experiences similar cases each year, possibly suggesting carrier status in ewes. Recently, researchers at the University of California Davis demonstrated a novel astrovirus (BoAstV-NeuroS1) that is phylogenetically related to an ovine astrovirus, in cases of bovine polioencephalomyelitis and spinal ganglionitis. Further work is ongoing to determine if similar links can be found between ovine astroviruses and polioencephalopathies.

Encephalopathy in a Swaledale lamb: Nervous signs displayed since birth in a 5 – 6-week-old Swaledale lamb was investigated. The flock reported similar cases last year and Border disease was suspected. Blood samples, spleen and formalin fixed brain were received. BDV PCR on spleen was negative. Histopathology identified polioencephalopathy with features suggestive of a neurological condition of young hill lambs previously reported (so called ‘Swaledale encephalopathy’), although the clinical presentation differed from that previously recorded. This condition has been identified in hill breeds, including but not exclusively Swaledales. The clinical presentation usually is quite distinctive, typically with clinical signs of head tremor, trismus and stiffness commencing between three and 21 days of age and worsening over time. The age of onset and irreversible progression suggest an inherent metabolic defect and the histology has similarities to Leigh syndrome in humans, a progressive heritable condition affecting energy production in mitochondria leading to neurological signs. Previous cases have been described by Scholes and others (2007) and those seen by AHVLA have been in younger lambs as euthanasia is typically carried out on welfare grounds.

Musculoskeletal disease

Spinal abscess: Spinal abscessation was diagnosed in lambs submitted to Thirsk when two five week old lambs were submitted live. One had
paresis/paralysis of all four limbs and on post mortem examination multiple spinal abscessations affecting the vertebrae from T1 to T8 was found (Fig 3). The second lamb exhibited paralysis of the hind limbs and a spinal abscess at L2 – L3 was found. *Staphylococcus aureus* was isolated from one of the lambs.

**Fig 3: Spinal abscess in a five-week-old lamb**

**Joint III:** Penrith investigated eight deaths in a group of lambs aged three to five weeks. Affected lambs were found dead or recumbent. Two lambs were submitted, one live and one dead. The live lamb was pyrexic and had slight exophthalmos and opisthotonus when stimulated. The lamb appeared to have head / neck pain. Postmortem examination findings were purulent septic arthritis affecting atlanto-occipital and multiple other joints. In addition the first lamb had perihepatitis and pericarditis. Bacteriological investigations of purulent material and turbid synovial fluid from joints yielded no growth initially despite culture of multiple sites, but both lambs had received antibiotic therapy prior to submission. On re-incubation *Trueperella pyogenes* was cultured from a single site. Culture of epicardial swab yielded a pure profuse growth of *Mannheimia glucosida*, an unusual finding, and most likely a secondary infection in a lamb already severely debilitated by the chronic joint-ill. The importance of incising multiple joints, including the atlanto-occipital joint, in cases of recumbent lambs cannot be overstated as cases of joint-ill can be overlooked where this is not done.

**PIGS**

**Alimentary Disease**

**Enteric colibacillosis outbreaks in older post-weaned pigs than usual:** AHVLA have diagnosed a few outbreaks of enteric colibacillosis over recent months in slightly older post-weaned pigs. The pigs have been dehydrated with fluid enteropathies and culture for *E. coli* is worth undertaking for diagnosis if the gross lesions are suggestive of this disease even if the pigs are older than those in which enteric colibacillosis is usually expected. One of these outbreaks was diagnosed at Thirsk when three pigs were submitted to
investigate an ongoing diarrhoea problem affecting pigs at about three-months-old. The pigs were from a small unit weaning at six-weeks of age and kept on solid floored accommodation. Post-mortem examination revealed enteritis and dehydration and pure growths of haemolytic *Escherichia coli* 0149:K91, K81 ac (strain Abbotstown) were obtained from small intestinal contents indicating a diagnosis of enteric colibacillosis. No other enteric pathogens expected for this age group were identified. The *E. coli* strain isolated was a known porcine pathogen associated with enteric disease.

**Respiratory Disease**

*Active swine influenza and porcine cytomegalovirus infections in fading weaners:* Four live piglets, at the point of weaning, were submitted to Thirsk to investigate a problem of fading that started at about six days post-weaning. Between 5 and 7% of piglets were affected with a mortality of about 2½%. Initially at weaning there were no obvious clinical signs but some pigs were reported to then develop respiratory disease and/or diarrhoea. Piglets were vaccinated before weaning for PCV2, *Mycoplasma hyopneumoniae* and ileitis. All the submitted piglets had varying degrees of pneumonia and two also had pleuritis. Testing revealed the presence of swine influenza (pandemic H1N1 2009 strain), *Streptococcus suis* type 8 and *Mycoplasma hyorhinis*; histopathological examination confirmed lung lesions consistent with swine influenza and a secondary bacterial infection. In addition there was severe rhinitis which histopathology revealed to be due to Porcine Cytomegalovirus (PCMV) infection and, unusually, there was also evidence of systemic PCMV infection in two of the four piglets. It is possible that piglets on the unit seen to have diarrhoea were also affected by viral respiratory disease at weaning predisposing to enteric changes as a result of inappetence and possibly dysbiosis and exacerbated by the stresses of weaning.

**Systemic disease**

*Porcine circovirus 2-associated disease in vaccinated pigs*  
Porcine circovirus 2-associated disease (PCVAD) was diagnosed in eight-week-old pigs sourced from two different breeding herds and vaccinated for PCV2 and *Mycoplasma hyopneumoniae* on arrival at their indoor rearing site at weaning. The pigs submitted with PCVAD were in poor body condition, one was jaundiced and the other had a bronchointerstitial pneumonia and enlarged inguinal lymph nodes. Histopathology revealed multifocal granulomatous lymphadenitis and lung lesions typical of PCVAD in both pigs; viral inclusions were visible in lymph nodes of the jaundiced pig and PCV2 was detected by immunohistochemistry in lymph node and lung of the other pig. Investigations continue into the apparent failure of PCV2 vaccination to control disease and include PCV2 genotyping – disease was limited to two of the four sources on farm suggesting a possible difference in immunological or virological status of the breeding herds from which the pigs were derived.

*Rare type of deformities in piglets due to an undetermined insult early in pregnancy:* A few piglets with unusual craniofacial deformities were born at term in litters from any parity of sow on an indoor herd in which other piglets in
The litters were unaffected. Arhinia was present accompanied by absence of the nasal cavity and olfactory lobes (Figure 4).

Fig 4: Bilateral arhinia in full-term piglet

The defects were either bilateral or unilateral; in humans this is a rare form of deformity. Based on the timing of embryonic development and the fact that olfactory pits are present in 7mm pig embryos (about 20 days), the histopathologist estimated that any insult leading to arhinia would have been before 20 days gestation. Thus there was a tight window for causing these lesions and, as disease only occurred over a six week period, it was transient, although not a point exposure as sequential weekly farrowing batches had a few affected piglets. Piglets were delivered full-term at the end of May so exposure to the insult would have been early February. The sows were liquid-fed on a wide variety of food by-products from multiple sources which are added to a wheat, barley and soya mix for feeding. There was no evidence of infectious exposure; and an association between this type of craniofacial malformation and viral infection was considered unlikely. It is possible that the malformations were a consequence of complex interaction between maternal and environmental factors. Involvement of toxic plants was very unlikely as the sows were indoors. The submission of typical cases in incidents of this nature is very useful in characterising the deformities, exploring possible aetiologies and allowing assessment of the likely timing of any insult.

Nervous disease

MISCELLANEOUS AND EXOTIC FARmed SPECIES

Choanal atresia in a neonatal alpaca cria: Bilateral membranous choanal atresia was diagnosed in a neonatal alpaca cria which had exhibited an increased respiratory rate and open mouth breathing since birth. Its condition failed to improve over the next few days and it was euthanased. Imaging and post mortem examination confirmed the presence of a bilateral membranous obstruction between the nasal cavity and the larynx. Choanal atresia is a congenital defect which may have a hereditary component and is due to an embryological developmental defect whereby membranous or bony tissue prevents air passing from the nostrils to the nasopharynx. Neonatal camelids are obligate nasal breathers. They can mouth breathe but in doing so cannot nurse properly so usually develop gas filled stomachs and starve, or develop inhalational pneumonia. Affected animals should be euthanased; surgical correction has been carried but other nasopharyngeal
defects may complicate the procedure. Due to the possibility that this condition has a hereditary component, affected animals that survive should not be used for breeding.

**Lymphoma in a three year old alpaca:** A cranial thoracic lymphoma, possibly of thymic origin, was identified in a three-year-old entire male alpaca which presented with poor body condition, subcutaneous oedema, abdominal bloat and regurgitation of two days duration. The cranial thoracic cavity contained multiple randomly distributed pale botryoid masses of firm consistency ranging from 10mm to 90mm in diameter. The prescapular and cranial thoracic lymph nodes were grossly enlarged and with the same appearance as the thoracic masses. No acid fast organisms suggestive of *Mycobacterium* spp were detected on examination of Ziehl Neelsen stained impression smears of the masses. Neoplasms of the lymphoid system are relatively common being diagnosed 2-3 times a year by AHVLA in animals varying in age from 3 weeks to 12 years.

**BIRDS**

**Commercial Layers**

**Erysipelas:** Rapidly increasing mortality was reported in a group of 16,000, 65-week old free range layers. No mortality was seen in an adjacent flock. The mortality rose from 100 a day to 400 a day over a 10 day period. Heart blood swabs submitted to AHVLA produced pure growths of *Erysipelothrix rhusiopathiae* confirming a diagnosis of erysipelas and accounting for the history of mortality. Owing to the increasing mortality, the flock was depleted early and the owner advised to vaccinate future birds. The majority of producers in the area are known to vaccinate.

**Gapeworm:** *Syngamus trachea* (gapeworm) infection was diagnosed in a submission of 59-week-old free range layers with a history of slight increase in mortality and drop in egg production accompanied by respiratory signs with gasping, sneezing and head shaking. Postmortem examination revealed pale carcases with active ovaries and thickening of the tracheal mucosa with partial to complete casts of fibrin and blood obstructing the airway. Histological examination revealed a chronic proliferative tracheitis and confirmed the presence of *Syngamus* sp nematodes embedded in the respiratory mucosa. Gapeworm is rarely diagnosed in commercial layer chickens; however, in this case, the birds presumably had access to earthworm or other transport hosts that were carrying *Syngamus* larvae.

**Broilers & Broiler Breeders**
Vegetative endocarditis: Septicaemia, femoral head necrosis and vegetative endocarditis due to *Streptococcus pluranimalium* was seen in a submission of 44-day-old broilers with a history of unexpected mortality since thinning. The postmortem findings included focal granulomatous-necrotic lesions in the liver and spleen, crumbly femoral heads and vegetative lesions in the heart valves. Routine cultures of heart valve lesions and a femoral head yielded profuse growth of alpha-haemolytic Gram positive cocci further identified by molecular methods (16S rRNA gene sequencing) as *Streptococcus pluranimalium*. This organism is recognized as a potential pathogen in the reproductive tract of cattle, and has been reported in association with septicaemia and vegetative valvular lesions in adult broiler breeders (Hedegaard and others 2009), but there appear to be no previous descriptions of its occurrence in broiler chickens. The means of entry of infection into this flock was not established.

Turkeys

**Pseudomonas aeruginosa:** *Pseudomonas aeruginosa* infection was identified as the cause of mortality in four-day-old turkey poults. Fifteen hundred poults had been placed at day old in three rings of 500 in the same shed. Mortality of 10% had been observed in one group of 500 poults but the other groups sharing the same shed were unaffected. At postmortem examination, the gross pathology was largely unremarkable and five out of the six poults had food in the crop and gizzard, but *P. aeruginosa* was isolated in heavy pure growth from the yolk sac of one bird and in mixed growth with a non-haemolytic *E. coli* from the liver of a second bird. *Pseudomonas* spp are considered to be opportunistic pathogens with infection arising from environmental contamination.

Game birds

**Rotavirus:** Rotavirus was considered to have contributed to 12% mortality in pheasants at ten days of age. The chicks came onto the unit as day-olds and some losses were reported at three days but were considered to be within the normal expectation. Two batches of birds were submitted aged three and ten days. There was no evidence of feed in the crop of any of the chicks examined and the content of the small intestine was sparse in all birds. The livers were small and pale and the gall bladders were distended, consistent with inappetence. The ten-day-old birds were not much bigger than the three-day-old birds. Otherwise the gastrointestinal tract appeared unremarkable in the three-day old birds but two of the ten-day old birds had moderate amounts of bubbly liquid yellow caecal content. Rotavirus was detected in pooled intestinal content in the three-day old birds but not in the ten-day old birds, suggesting an early insult, which may well have explained the poor growth by ten days of age. It was also considered that managemental factors could be involved as the clinical presentation was not considered entirely typical of a rotavirus outbreak. No bacterial pathogens were detected.
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, Leahurst, 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/)