Goose parvovirus
APHA Disease Surveillance Report
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- *Klebsiella pneumonia* septicaemia associated with mastitis
- IBR associated with encephalitis
- Husk

**CATTLE**

*Systemic disease*

**Hypomagnesaemia**: Hypomagnesaemia was diagnosed in a group of 20 dairy calves which were being fed only milk and straw. One animal died with another found recumbent but had responded to the administration of intravenous minerals. Biochemistry on blood samples from two of the affected calves identified magnesium concentrations of 0.37 mmol/l and 0.17 mmol/l (reference interval 0.7 – 1.3 mmol/l). APHA comments that hypomagnesaemia is more commonly diagnosed in fast growing suckler calves which are receiving little or no supplementary feed, as the intake of magnesium from milk alone is inadequate.

**Mycoplasma wenyonii**: A diagnosis of *Mycoplasma wenyonii* infection was made in two dairy herds. One was a herd of 330 where infection has previously been identified. Milk drop and a swollen udder and hind limb, were reported in one cow. In the second herd, four of the 300 cows were reported with signs of udder and/or teat swelling, with milk drop varying from none to 30%. Bilateral hind limb swelling was also present in one. In each case the diagnosis was reached by the identification of the causative organism using the DGGE/PCR technique on EDTA blood samples. There have been several reports of *M. wenyonii* infection in cattle in the last 10 years, possibly because of an increased awareness and the availability of improved diagnostic testing. Many of the aspects of this disease are unknown and it is consequently difficult to be certain how to treat affected animals or prevent infection. A review of the current knowledge of this condition was recently published (Strugnell and McAuliffe 2012).

*Respiratory disease*
**Pneumonia and tick borne fever:** Penrith diagnosed an outbreak of pneumonia caused by *Mannheimia haemolytica* which was complicated by tick-borne fever. Examination of the pluck from a three-month-old suckler calf which had been at pasture in a known tick area identified patchy consolidation and pleuritis with mucopurulent exudate in the bronchi and small erosions on the laryngeal cartilages. Histopathology confirmed a necrotic bronchopneumonia and fibrinous pleurisy. *M. haemolytica* was isolated with no evidence of respiratory virus infection. However, a PCR test for *Anaplasma phagocytophilum* was positive which suggested that immunosuppression caused by tick-borne fever may have precipitated the onset of mannheimiosis.

**IBR** was diagnosed in an eight-month-old Holstein-Friesian heifer within a group of 30 at grass. The animal presented with rapid weight loss, dullness and lethargy, and had a crusty nasal discharge with halitosis. Postmortem examination revealed ulcerative necrosis of the mucosa of the pharynx, oesophagus and larynx. A thick purulent exudate was present within the trachea and the nasal cavity. PCR examination of laryngeal tissue detected Bovine Herpesvirus 1 (BoHV-1) nucleic acid. Histological and immunohistochemical findings confirmed BoHV-1 infection of the larynx and oesophagus and in addition identified encephalitis. The anatomical distribution of the brain lesions was consistent with intra-axonal spread of BoHV-1 virus from the laryngeal/oesophageal lesions via primary visceral nerve afferents to the brain stem. APHA comments that IBR is most commonly associated with upper respiratory tract pathology, but as with other herpesvirus infections, neural spread can occur and accounts for the chronic infection in many animals. BoHV-1 virus can remain latent in ganglia with reactivation potentially occurring when the animals are stressed.

**Husk:** Outbreaks of husk were diagnosed in several VI Centres. Unusually, Shrewsbury and Carmarthen both reported cases in suckler herds. Husk has regularly been diagnosed on English and Welsh farms over the last 15 to 20 years, with nearly all cases occurring in dairy herds and often in heifers or young adult milking cows. In each of the recent cases the affected animals were coughing and disease was confirmed by the demonstration of *Dictyocaulus viviparus* larvae in faeces samples by Baermann’s technique.

**Enteric disease**

**Salmonella Dublin:** Penrith isolated *Salmonella* Dublin on direct culture from a faeces sample which was submitted from an adult Holstein-Friesian milking cow with fetid diarrhoea. It had calved one month previously but developed fetid diarrhoea and was anorexic. Liver fluke and rumen fluke eggs were also detected. Most of the isolates of S. Dublin in England and Wales (more than 96% in most years) are sensitive to all antimicrobials tested; however, the antimicrobial resistance profile of this strain was slightly unusual as it was resistant to tetracyclines, ampicillin and streptomycin. There were no associated cases of human illness. The farm had a previous confirmed case
of S. Dublin infection in a one month old diarrhoeic calf in 2012 with the S. Dublin isolate showing full antibiotic sensitivity. The origin of the more recent resistant isolate is not known. Although the farmer purchased occasional cows from the local market he had not imported from the continent or elsewhere. Strains of S. Dublin with multiple antibiotic resistance have been reported in other countries. Resistance to the antibiotics tetracyclines, ampicillin and streptomycin can be commonly identified in E. coli isolates on most farms and the possibility of genomic transfer between the bacterial species seems most likely in this case.

**SMALL RUMINANTS**

*Enteric disease*

Acute fasciolosis was diagnosed by Carmarthen at the end of August as the cause of death of 4 ewe lamb replacements from a group of 100. One animal had been treated for possible respiratory disease and died, the others had been found dead. Postmortem examination of a submitted carcase revealed pallor with several litres of serosanguinous fluid free in the abdominal cavity and a large blood clot associated with the capsule of the liver. The liver parenchyma was pale with small dark tracts throughout. Microscopic examination of finely cut liver detected numerous immature *Fasciola hepatica*. Advice was given including treatment with a product effective against immature fluke and movement to less infective pasture.

Parasitic gastroenteritis contributed to severe ill thrift in a group of preweaned lambs. The lambs were at grass with their dams and were not receiving supplementary concentrates. The group had received a macrocyclic lactone anthelmintic five weeks earlier, the only wormer given to date. A lamb submitted for postmortem examination was in extremis and weighed only 12kg. There were no internal fat reserves, the myocardium was flaccid and kidneys slightly pale. The faecal worm egg count was very high (12,700 trichostrongyle-type worm eggs per gram) and serum biochemistry showed marginal vitamin B12 and GSH-Px levels and hypoproteinaemia. BDV PCR was negative. As the ill thrift was evident pre-weaning, investigation of maternal factors such as mastitis, poor milk yields or milk availability due to parity or litter size was advised in addition to more frequent monitoring of faecal worm egg counts to allow improved parasite control.

*Nervous disease*

Louping ill was confirmed in two Welsh Mountain ewes from North Wales. A group of 200 had been brought off the mountain a week previously. Four animals exhibited neurological signs of a few days’ duration and subsequently two died. Clotted blood samples were submitted and were tested for Louping ill by Haemagglutination Inhibition Test (HAIT). Results were positive, with total immunoglobulin values of ≥1/10240 but IgG levels of only 1/40 and 1/320, indicating a high level of IgM which is consistent with acute infection. Louping ill is non-suppurative encephalitis caused by a Flavivirus. Viral transmission most often occurs via *Ixodes ricinus* ticks; consequently, there is a marked seasonality to cases. Sheep are the main species affected but cattle, goats, horses, deer, pigs and grouse can also be infected. Following
infection, there is an initial viraemic period of two to four days, with antibodies detectable after five to ten days. Recent infection is indicated by a four-fold increase in antibodies from acute to convalescent blood samples or by the demonstration of IgM antibodies in clinical or recovering cases as was seen in this case. Ewes in endemic areas are often immune with colostral protection in lambs lasting for about three months, so cases predominantly occur in yearlings and lambs, or sheep with no immunity purchased from non-tick areas. Stress factors and concurrent Tick Borne Fever can increase the pathogenicity of the virus. Louping ill is a zoonotic disease.

Skin disease
Orf was the cause of extensive proliferative changes in the skin of a two-month-old lamb. The lamb was the only one affected and had swollen, hot, limb extremities. The lamb was able to walk but the proliferative changes involved the interdigital space and coronary band of all feet (Fig 1). There were similar changes around the accessory digits and grey verrucose areas over the carpal joints. At postmortem examination there was enlargement of the prescapular and popliteal lymph nodes with oedematous cut surface with focal green / yellow lesions within the lymph nodes. Pasteurella multocida was cultured from the lymph nodes and organisms suspicious of Dermatophilus congolensis from the carpal scabs. Parapox virus was detected in scab material by electron microscopy. Histopathological findings were severe, focal, extensive hyperplastic perivascular dermatitis typical of Orf together with Dermatophilus sp infection most likely as a secondary pathogen. Severe skin lesions attributable to Orf and Dermatophilus are seen from time to time at APHA and the explanation as to why some individuals are so severely affected is unclear. Individual host susceptibility may play a role.
Systemic disease

**Cobalt deficiency** (pine) was diagnosed in a group of ill thriven, four month old Texel cross lambs at grass, based on serum vitamin B12 estimation. The mean vitamin B12 of eight blood samples tested was 170 pmol/l (reference interval >188pmol/l). Faecal samples also submitted to investigate the ill thrift provided no evidence of concurrent parasitic enteritis. In previous years the flockmaster had used benzimidazole anthelmintics which often contain selenium and cobalt; however due to changes in worming strategy the lambs have not received any trace element supplementation this year. There are various methods of supplementation available and choice depends on several factors including expected finishing date, preferred route of administration, frequency of gathering and product selection may be different for prime lambs compared with lambs reared as replacements.

**PIGS**

Reproductive Disease

**Outbreak of reproductive failure due to porcine reproductive and respiratory syndrome:** Porcine reproductive and respiratory syndrome (PRRS) was diagnosed at Bury St Edmunds as the cause of an acute outbreak of late-term abortions in eight sows on a PRRS-vaccinated 200-sow indoor herd. Aborting sows were off-colour, inappetant and pyrexic (40-41°C) for 24-48 hours prior to abortion around a week before they were due. No
PRRS virus, or any other infectious agent of abortion, was detected in submitted fetuses, but viral RNA was detected in serum from two of five sows sampled. Interestingly the two PCR-positive sows were those with the most recent pyrexia and abortion at the time of sampling. Following mass vaccination of the herd, disease had reduced and abortions had stopped, but there were increased returns, and litters of poor viability continued to be born, typical of PRRS outbreaks and causing significant economic impact. Gilts are homebred on the unit and their litters were not affected, raising the possibility that endemic virus had been circulating at a low level in the rearing herd, and disease followed spill-over into the breeding herd, affecting mainly older sows. PRRSv sequencing is in progress to investigate further and compare the current virus with that detected in the past on this unit.

**Systemic disease**

*Klebsiella pneumoniae* septicaemia also associated with mastitis in sows for the first time: Following the disease alert circulated about *Klebsiella pneumoniae* subsp. *pneumoniae* (Kpp) septicaemia, two outbreaks were diagnosed in East Anglia during August. The first outbreak, diagnosed in early August, was typical and affected well-grown preweaned pigs from two-weeks-old on an outdoor breeding herd. The problem had been ongoing for about 12 weeks (ie the last four farrowing batches) prior to submission with a few piglets dying in a few litters across sow parities; the sows themselves were well. In the batch from which dead pigs were submitted, 12 three-week-old piglets had died from 1,500 and a few had been found with dyspnoea, in sternal recumbency with reddened eyes shortly before dying. The submitted pigs had red-purple skin discolouration, fibrin stranding in the peritoneal cavities and pinpoint haemorrhages over the intestinal serosae. Pure growths of Kpp were obtained from viscera confirming the diagnosis.

The second Kpp outbreak was typical in that there were sporadic sudden deaths of piglets around three-weeks-old. However the outbreak was unusual and significant in that, just after Kpp was diagnosed in piglets on the unit, several sows in the same farrowing batch as the affected piglets became severely ill; some affected sows were in adjacent farrowing paddocks to each other. Eight sows were affected from the group of 150 which were soon to be weaned, and five died. Affected sows were acutely depressed and inappetant with skin discolouration especially around the perineum, vulva and mammary glands. A prompt visit was made by the attending veterinary surgeon who suspected severe toxic mastitis. This was confirmed when a sow was euthanased and submitted. Figures 2 and 3 show the mammary gland lesions – multiple glands were affected and Kpp was isolated in pure growth.

Figure 2 Mastitis due to *Klebsiella pneumoniae* infection
A severe fibrinopurulent mastitis with thrombosis and necrosis was identified by histopathology. The Kpp showed in vitro resistance to ampicillin/amoxicillin only, which reflects innate resistance shown by all Kpp. As a short-term control measure, creep feed medicated with potentiated sulphonamide was being offered to piglets from ten-days-old and prompt treatment of any further suspect mastitis cases with potentiated sulphonamide was recommended by the attending practitioner. No further deaths have occurred to date and future use of an autogenous vaccine is being considered.

Figure 3: Cross section of gland affected with Klebsiella pneumoniae mastitis
Glässers disease with severe skin lesions in weaned pigs: Six-week-old piglets were submitted to Thirsk from a batch of 700 where about 20 had died over a few days. The clinical problem began about five days after weaning with one or two pigs being found dead each day. Affected piglets appeared uncomfortable, with swelling of the ventral skin and inguinal area and sometimes parts of the limbs. The submitted piglets were not pyrexic but walked with a stiff gait. There was marked pitting oedema of the skin of the ventral abdomen, scrotum and inguinal region and large well demarcated purple areas were present where the skin surface was necrosing as shown in figure 4. The affected skin was cold to the touch and, on incision, thick subcutaneous oedema was revealed as shown in figure 5. There was also evidence of generalised lymphadenopathy and fibrinous pericarditis, pleuritis and peritonitis, typical of Glässers disease, which was confirmed by isolation of pure growths of *Haemophilus parasuis*.
Figure 4: Unusual skin lesions on the ventral abdomen in a pig with Glässers disease

Figure 5: Marked subcutaneous oedema in a pig with Glässers disease

BIRDS

Turkeys

Deaths in four-week-old turkey poults were attributed to colisepticaemia and coccidiosis. About 75 had died out of 1800 bought in at day old. The clinical signs included gaping and uneven growth. Some wet litter due to diarrhoea was also reported. The poults were bedded on straw and had been treated with antibiotics which had reduced the losses. At post-mortem examination, there was a polyserositis, pericarditis (Fig. 6) and airsacculitis in 3 out of 4 birds and heavy pure growths of *E. coli* were isolated from all sites cultured. No *Mycoplasma* infection was detected by DGGE or serology and avian pneumovirus was not detected by PCR from 3 birds. In the fourth bird, there was no polyserositis and airsacculitis but there was liquid caecal and rectal content and profuse numbers of coccidial oocysts were detected in scrapings of the intestinal mucosa. Good litter management (dry, not dusty litter) and good ventilation to prevent a buildup of ammonia are important in the control of colisepticaemia. Good litter management is also important in the control of coccidiosis, as is the use of anticoccidial medication in the feed during the rearing period.

Fig 6. White fibrinous exudate over the pericardium of a four-week-old turkey affected by colisepticaemia.
Ducks and Geese

Goose parvovirus infection (Derzsy's disease): A former dairy farm, with a beef suckler and heifer rearing enterprise, also reared geese for Christmas from their own eggs and others bought in from neighbours. Twelve goslings died within the first week of life, many with no premonitory signs, although those that lived for longer showed signs of sleepiness. Postmortem examination revealed a mild catarrhal enteritis and lung oedema in the goslings. Histopathological examination demonstrated intestinal pathology, including intranuclear inclusion bodies, consistent with goose parvovirus infection (Derzsy’s disease). The disease can be transmitted both vertically through the egg and horizontally between goslings, and the highest mortality is seen in goslings in the first week of life. This disease has re-emerged in Great Britain over the last ten years after a period of absence since the 1980s. The source is unknown; however, the disease is widespread in Europe could possibly have been introduced via imported birds or eggs. A vaccine is licensed in Europe, and has been used to control disease in GB under Special Import Certification

Game birds

Enteritis and mortality in pheasants: Diarrhoea was reported in two batches of three-week-old home hatched pheasant poults, each batch of 1,000 birds being affected. Diarrhoea had started six days before submission and a total of 45 poults had died. Gross signs of enteritis were seen in two of four birds examined with reddening of the small intestine mucosa and dilated caeca with frothy contents. This was a mixed infection where the enteritis was found to be associated with both Spironucleus (Hexamita) and rotavirus infections. The two agents were likely to have been acting synergistically, and the presence of Spironucleus at this relatively young age suggested a high level of exposure in the environment of the birds.

Spironucleus sp (Hexamita), coccidial infection and gapes were diagnosed in a submission of nine-week-old pheasants with a history of malaise and slight increase in mortality, which had been released a week previously. Postmortem examination revealed marked dehydration, loss of body condition, numerous gape worms (Syngamus trachea) mixed with mucus in the tracheal lumen and sparse/mucoid small intestinal contents. Wet smear examination of the small intestine revealed small numbers of coccidial forms and histopathology revealed dense aggregates of protozoa in the intestinal crypts consistent with Spironucleus sp. The timing suggested that the birds had been exposed to S. trachea larvae as soon as they entered the release pen. This or other post-release stress factors may have increased the susceptibility of the birds to the effects of Spironucleus infection, originally acquired either on the rearing site or in the release pen itself.
**Ulcerative enteritis in partridges:** Ulcerative enteritis-like lesions were found in a batch of 15-week-old red-legged partridges with a history of increased mortality just after release. Postmortem examination showed that the birds were in good bodily condition and there were small round foci of mucosal ulceration in the caeca, small foci of necrosis in the livers and swollen spleens. Histological examination of the liver lesions revealed acute necrotizing hepatitis associated with central clusters of rod-shaped bacteria consistent in size and shape with *Clostridium* sp and there were prominent foci of ulceration and necrosis of the mucosa in the caeca. The lesions were typical of ulcerative enteritis caused by *Clostridium colinum*. Red-legged partridges are particularly susceptible to this disease; birds can carry the organism without showing signs of illness, but intestinal damage or disturbance, for example caused by coccidiosis or following stress of any kind can allow overgrowth of the bacteria in the gut and trigger the disease (no evidence of coccidiosis was found at this examination). Recovered birds remain as active carriers, shedding the organism in the faeces which results in the birds’ environment becoming contaminated.

**MISCELLANEOUS FARMED SPECIES**

**Endoparasitism in alpaca:** Rumen fluke (paramphistomes) and a trichostrongyle count of 410epg were detected in a faeces sample from a 4-year-old alpaca with weight loss and diarrhoea with both findings being potentially significant. In cattle, acute paramphistomosis is caused by a massive infection with immature worms in the small intestine, usually occurs in animals less than two years of age and is characterised by listlessness, anorexia and diarrhoea. The association between the presence of rumen fluke and clinical disease is not well established, although the presence of the parasite is often complicated by other conditions (animals with ill thrift, poor condition). Adult rumen fluke are generally considered non-pathogenic although immature fluke cause significant duodenitis/abomasitis. This is an unusual finding but was also reported in alpacas by the APHA last year.

**Reindeer:** Endoparasitism (350 trichostrongyle-type epg) and likely hypocupraemia were diagnosed in a reindeer showing diarrhoea and ill thrift. The copper level was 4.6μmol/l and although APHA has no reference interval for reindeer this value was considered low in comparison to the reference interval of 9 - 19μmol/l for other domestic ruminants.

**References**