Highlights

- Parasitic bronchitis (Husk) frequently diagnosed in cattle
- Two outbreaks of botulism in cattle and one in sheep investigated
- Bovine Babesiosis incidents in North Wales, The South West and Scottish borders
- Parasitic gastroenteritis continuing to cause losses in sheep
- Cases of acute fasciolosis in sheep provide an early warning of a high risk of disease
- Histomoniasis (blackhead) diagnosed in turkeys and chickens
- Continuing losses in Gamebirds caused by Spironucleosis (Hexamita) infection

CATTLE

Reproductive diseases

Bacillus licheniformis
A foetus of seven months gestation was presented at Luddington for post-mortem examination after two dairy cows in a 110-cow herd aborted within three weeks. Necropsy revealed an oedematous pericardium, and culture of the foetal stomach contents and pericardium yielded pure growths of Bacillus licheniformis. This organism has been the commonest bacterial causes of abortion in cattle in 2007. 64% of cases have affected dairy herds, 26% beef herds with 10% unknown. The diagnosis was twice as common in the Northern, Midlands & Western regions and Wales than in the South West. Few cases have occurred in the South East.

Leptospirosis
Shrewsbury investigated two abortion outbreaks in dairy herds associated with Leptospirosis, following the demonstration of leptospiral DNA by PCR in the kidneys of aborted calves. The first was in a flying herd of around 300 cows, which was managed on 2 sites. A recent bulk milk ELISA had indicated high seroprevalence (OD 0.944), although surprisingly only a few...
abortions were reported. In the second herd of 520 animals in total, 2 abortions had occurred in a group of 28 maiden heifers. Langford examined paired blood samples from three cows exhibiting milk drop in one dairy herd. Significant titre rises to *L. Hardjo bovis* were demonstrated in all three cases.

**Iodine deficiency**

Starcross investigated a herd of 71 Limousin suckler cows, which had experienced three stillborn calves in recent weeks, and two further calves that were weak at birth and required intensive nursing. Pooled bloods from three pairs of dry cows had PII levels ranging from 45 to 70 ng/ml (reference range 105-287), suggesting that iodine deficiency was playing a role. A further 10 cows had extended calving to conception intervals.

**Enteric diseases**

**Fasciolosis**

Liver fluke infestation was diagnosed four times at Aberystwyth and four times at Carmarthen. In one case, two dairy cows from a north Wales herd that had been losing condition over several months were reported as having profuse diarrhoea and poor milk yields. It was reported that one cow, which was in particularly poor condition, died the day after sampling.

**Johne's Disease**

Preston reported that Johne’s disease continued to be the commonest diagnosis for diarrhoea and ill thrift in adult cattle. Thirteen cases, all in dairy cattle, were diagnosed over the month with four of these in herds with a previous history of disease. All were diagnosed on serology bar one where acid-fast organisms were demonstrated in a faecal smear.

**Respiratory Diseases**

**Parasitic bronchitis (Husk)**

Ten laboratories diagnosed husk during a month with 40 incidents of disease being investigated. Twenty five incidents involved adult cattle mostly dairy animals. Shrewsbury diagnosed husk by demonstration of *Dictyocaulus viviparus* larvae in faeces samples from animals on 6 farms, and on post mortem examination on a seventh farm where 3 yearlings had been found dead in a group of 66 stores. Disease was also suspected in another herd on the basis of positive serology and acute onset of clinical respiratory disease in around 20 dairy cows. Affected farms were in Shropshire (4 cases), Staffordshire (2 cases), Herefordshire and Gwynedd. All except one were in dairy herds, one of which was an organic farm, with the other a group of yearling store cattle.

Preston also diagnosed lungworm on two units, one beef and one dairy, following identification of larvae in faecal samples examined by Baerman’s technique. The beef animals were a group of 8-10 month old finishing animals at grass, which had not been vaccinated and had not received any wormers throughout the grazing period.
IBR
Preston diagnosed IBR as the cause of respiratory disease in eight, 15-month-old bullocks in a group of 30 grazing permanent pasture. Some of the group had been coughing since early August and one or two had improved with non-specific treatment, however two died. The private vet described ventral consolidation of lungs and emphysema of caudal lobes and submitted fresh and fixed lung tissue for further investigation. Two FATs for IBR on smears from airways were negative; however the diagnosis was reached by histopathology, which showed marked congestion, pulmonary oedema and multifocal alveolar haemorrhage with patchy fibrinonecrotic bronchiolitis and erosion and ulceration of some airways. Specific labelling of degenerate and necrotic epithelium confirmed acute necrotising bronchiolitis associated with BHV1.

Pasteurella multocida and Mycoplasma ovipneumoniae
Starcross identified *Mycoplasma ovipneumoniae* in association with *Pasteurella multocida* as the cause of pneumonia affecting a five-month old Holstein-Friesian male calf. The animal was one of approximately 50 to have died in a group of 200 over recent months. No viral agents were identified and the Mycoplasma was identified using DGGE. *M. Ovipneumoniae* is a respiratory pathogen of sheep and is a very unusual finding in cattle. There was no evidence of sheep or goat contact on the farm and the source and significance of the isolate remains unclear.

Mycoplasma bovis
Preston diagnosed *Mycoplasma bovis* as the cause of a severe bronchopleuropneumonia in a 3-month-old calf. The calf was in a group of 30 animals, in which some animals had developed pneumonia. It was felt this was due to stocking problems arising from movement restrictions. The calf had died within 24 hours of the onset of clinical signs, and no other respiratory pathogen, either viral or bacterial was identified.

BVD
The carcase of a five-month-old Limousin suckler calf was submitted to Thirsk for post-mortem examination to explain its death following a short but severe illness. The animal presented with weakness, dyspnoea, pyrexia and epistaxis and did not respond to symptomatic treatment. Gross post-mortem findings included a diffusely orange swollen liver, widespread petechial haemorrhages (synoviae, tracheal mucosa, omentum) and marked interlobar and interlobular pulmonary haemorrhages (see Figure 1). An RT-PCR test on spleen proved positive for BVDV type 1, suggesting viraemia which was confirmed as persistent infection (PI) by extensive labelling of the hippocampus by immunohistochemistry was the cause of the haemorrhagic diathesis.
Nervous Diseases

Listeriosis
Listerial encephalitis was diagnosed at necropsy of a five-year-old dairy cow at Carmarthen. This was the only animal affected in an eighty cow dairy herd. There had been a rapid onset of clinical signs over four days. The animal became depressed with a unilateral facial paralysis and drooping ear and circling. It was euthanased and presented for necropsy. There was very little gross pathology, other than the presence of live fluke in the liver. *Listeria monocytogenes* was cultured from the brain stem confirming listeriosis.

Botulism
Botulism was diagnosed in a 135-cow dairy herd, which was adjacent to a broiler unit in the same ownership. In total 83/120 lactating cows died or were culled over a three-week period. The main clinical signs were sternal recumbency (Figure 2.), lateral recumbency, mild constipation and death. Two housed six-month-old heifers were also affected. The main source of the outbreak was initially thought to be washings of the broiler unit which had been accidentally spread onto grazing land. However, later in the investigation two other possible sources were identified.
The bucket used to clean out broiler litter may have been used to mix some TMR ingredients such as caustic wheat and some litter spread on an arable field was spread through the hedge contaminating a grazing field. Sutton Bonington also diagnosed Botulism in a group of dairy heifers which had been caused by indirect access to a heap of poultry litter in close proximity to the cattle field. Four deaths had occurred before a euthanased carcase was submitted for post-mortem. Haemorrhagic watery contents were present in the proximal small intestine in which the presence of Type D botulinum toxin was later confirmed. Following movement to nearby aftermath a further three animals became affected and two died. Advice regarding vaccination was given.

**Other Diseases**

**Babesiosis**
Shrewsbury diagnosed Babesiosis by microscopy on a blood sample from a 7-year-old Belgian Blue cross suckler cow on Anglesey. It had exhibited sudden onset weakness and was dehydrated and anaemic. Two other animals on the same farm were reported to have died recently exhibiting respiratory signs. The reason for the occurrence of disease is uncertain as the farmer reported that the animals were not purchased and he was using
the same grazing as in previous years. Reports of several other cases of Babesiosis on the island were confirmed by the local veterinary practice. In another case Langford diagnosed the disease affecting a suckler cow, which exhibited jaundice, haemoglobinuria and ocular oedema was initially suspected of having copper poisoning, in a herd having a history of one to two such cases each year. No evidence of copper poisoning was found but haematology readily revealed numerous Babesia spp. confirming the disease. Penrith also diagnosed the condition in a 4-year-old Shorthorn cow. The affected farm was in an area just over the Scottish border where babesiosis had not previously been diagnosed.

**SMALL RUMINANTS**

**Enteric diseases**

**Parasitic Gastroenteritis (PGE)**
Parasitic gastroenteritis continued to be frequently reported with suspected anthelmintic resistance being identified in some outbreaks. In one investigation of suspected resistance 100 out of 110 lambs were affected with diarrhoea and poor body condition. The trichostrongyle worm egg count was high with a count of 2,300. Subsequent testing for resistance demonstrated benzimidazole resistance in Teladorsagia and Cooperia species. In the second submission there was a long history of benzimidazole usage and samples were submitted for screening. The anthelmintic resistance test demonstrated evidence of benzimidazole resistance in Teladorsagia and Haemonchus species. Nematode species involved in outbreaks of PGE during the month included Haemonchus contortus, Telodorsagia circumcincta, T. trifurcata, Trichostrongylus colubriformis, T. vitrinus and Cooperia curticei. High faecal egg counts were reported associated with H.contortus infections, Winchester describing counts of 14,150 epg in one case and Starcross 62,500 epg in another.

**PGE in Goats**
RVC investigated a disease outbreak in a goat herd in which several animals had been either found very depressed with sudden onset of diarrhoea and often subsequent death or were in a poor body condition. Post mortem examination of a twelve-week old kid revealed a very poor body condition, anaemia and high numbers of 9000 Haemonchus contortus and Ostertagia spp in the abomasum as well as 8500 nematodes comprising Trichostrongylus spp and Cooperia spp in the small intestine. Worm egg counts carried out on two further submitted faeces samples demonstrated 6,200 and 2,300 Trichostrongyly-type eggs per gram respectively. Anthelmintic treatment was carried out and a worm control programme instigated.

**Respiratory Diseases**

**Mannheimia haemolytica**
Cobalt deficiency and Mannheimia haemolytica pneumonia was diagnosed in two Texel cross lambs presented for necropsy at Carmarthen. These were
two of 50 lambs in a 900-ewe flock that were not thriving. In previous years the owner had suspected photosensitization as the cause of hair loss and skin infection of the heads of lambs. Hair loss was found in one of the two lambs at necropsy, affecting the ears and the pole of the head. Both lambs were in thin condition and depressed prior to euthanasia and necropsy. Liver vitamin $B_{12}$ levels were measured at $<0.07$ mg/g wet matter indicating severe deficiency.

**Nervous Diseases**

**Botulism**
Botulism was suspected in a flock of 300 ewes after a large heap of poultry litter was deposited in the field the sheep were grazing. Post-mortem findings in two affected ewes submitted to Luddington were unremarkable bar a chronic pleuritis in both animals. A farm visit was arranged to investigate the outbreak. 14 ewes had died/were culled and another 15-20 were showing signs of recumbency, weakness, urinating after getting up, stiff gait, holding their head too high, and looking startled when observed. The sheep were moved to an adjacent field and it was advised to fence off the heap. No carcase material was seen in the litter. Voluntary movement restrictions were agreed to protect the food chain.

**Louping Ill**
Two Swaledale ewes were submitted to Penrith for necropsy from a hill farm where there had been four deaths in a group of 150. The affected ewes showed neurological signs including ataxia and tremor. Ticks had been seen on the sheep despite treatment with cypermethrin pour-on, four weeks earlier. The diagnosis was confirmed on serology and immunohistochemistry of the brain.

**Other diseases**

**Fasciolosis**
There were reports of acute and subacute Fasciolosis indicating a significant parasite challenge to sheep on infected pasture. The weather conditions during the year have been favourable to intermediate host development and a significant level of disease is anticipated this autumn. Carmarthen diagnosed subacute fasciolosis in a four-year-old Texel ram. Three rams had died in a group of six rams in the last two to three weeks. The first ram was found dead and the second ram showed respiratory signs and a distended abdomen. Luddington diagnosed several cases of acute fasciolosis this month. One outbreak occurred in a small flock of eight Jacob sheep, of which two had died due to ruptured livers. In another flock the ewes had been drenched with triclabendazole five weeks previously. Despite this, one ewe presented with anaemia soon followed by death. Necropsy demonstrated several litres of fluid containing fibrin strands in the abdomen, fibrin attached to the liver capsule and a grossly abnormal liver with immature fluke up to 5 mm in length in the bile ducts.
Langford diagnosed Fasciolosis in a five year old Texel cross ewe which had been submitted to investigate the cause of condition loss and death occurring over a three-week period affecting five in a group of 80, with three subsequently dying.

**Keratoconjunctivitis**

*Mycoplasmia conjunctivae* was demonstrated by PCR in one of two conjunctival swabs submitted from a flock of 400 Wensleydale sheep. 150 of a group of 200 were reported to have symptoms of extensive keratoconjunctivitis which was responsive to treatment with oxytetracycline. The lambs were not affected.

**PIGS**

**Reproductive diseases**

Langford diagnosed abortion due to a Group L *Streptococcus*. Affected fetuses were aborted in the last third of pregnancy by a Gloucester Old Spot sow. There was no gross fetal pathology but pure growths of a Group L *Streptococcus* were isolated from the fetal stomachs sampled. Sporadic cases of abortion in pigs due to Group L *Streptococcus* are occasionally reported, and likely to be from an ascending infection.

**Enteric diseases**

**Swine Dysentery**

Preston described two outbreaks of swine dysentery. In the first examination of a scouring four-week-old piglet revealed gross evidence of typhlitis/colitis. The IFAT for Swine Dysentery on caecal mucosa was positive although attempts to isolate the organism were not successful. Animals in approximately 10 previous litters had been affected with scours starting at around 3 weeks of age.

Swine Dysentery was also diagnosed in an 18-week-old scouring ill thriven pig from a unit fattening pigs on whey. 12/200 animals were affected in various age groups with six deaths. The animal had moderate chronic hyperplastic and mucoid colitis and colonic contents gave a positive result in the Swine Dysentery IFAT (culture results awaited). The animal also had severe oesophageal/gastric stenosis/stricture probably secondary to earlier ulceration of the pars oesophageal

**Salmonellosis**

Salmonellosis due to *Salmonella Typhimurium* phage type 193 resulted in scour and ill thrift affecting approximately 30 five-week-old pigs from a group of 2000. There were 10 deaths at the time of submission of a carcase to Preston. The pigs had been moved to the unit one week previously. Gross lesions were typical of salmonellosis and included necrotic enterocolitis and a severe typhlitis.

**Enterotoxaemia**

Bury investigated a case where nine of 400 pre weaned piglets died suddenly at 16 to 18 days old on a newly set up 1,200 sow indoor breeding unit. Several litters were affected, with just one or a few pigs affected in any one litter. Gross findings were very suggestive of clostridial enterotoxaemia with
diffuse diphtheresis of the small intestinal mucosa, with the most severe lesions in the jejunum. Clostridial enteritis was confirmed by detection of specific toxin in intestinal contents.

**Respiratory Diseases**

Concurrent PCV-2 and PRRSV infections were diagnosed as the cause of ongoing problems of severe respiratory disease on a large 10,000-pig indoor continuous nursery-finisher unit. Mortality of approximately 3% per week was reported. Two 10-week-old pigs were submitted following acute onset of dyspnoea and death. Both pigs had severe multifocal bronchointerstitial pneumonia with strong histopathological evidence for PCV2 involvement and good immunohistochemical confirmation of active PRRS infection. Intracytoplasmic viral inclusions were visible in the lymph nodes of one pig with histopathological lymphoid lesions typical of active PCV2 infection.

**Other diseases**

Two fattening pigs were found dead from pens of 12 and 20 pigs on slats. PDNS was diagnosed in one submitted pig; the other was too autolytic for meaningful examination. Uraemia due to the PDNS was considered the likely cause of multiple ulcers on the buccal mucosa, gingivae and tongue which were reported to the AHDO. A farm visit by a veterinary officer ruled out foot and mouth disease on the farm of origin.

**Nervous Diseases**

Streptococcal septicaemia, meningitis and arthritis due to *Streptococcus suis* serotype 2 infection exacerbated by active PRRS virus infection was diagnosed on a unit where 70 of 1100 eight-week-old pigs in outdoor tents died over two weeks with 12 dying in the 24 hours prior to submission of three dead pigs. Clinical signs included sudden deaths, nervous signs typical of meningitis and respiratory disease. There was no histopathological evidence of PCV-2 involvement but PRRS virus was detected by PCR in tissues from one pig.

**BIRDS**

**Poultry**

**Colisepticaemia**

At least 20 chicks per day were being culled in a shed of 32,000 19-day-old broilers due to poor condition. 10 carcases were submitted to Shrewsbury for post-mortem, and six out of 10 had extensive peri-hepatitis, pericarditis, peritonitis and air sacculitis. Colisepticaemia was diagnosed following the isolation of pure growths of *E. coli*. Remnants of yolk sacs were still present in two birds, measuring up to 1.5cm diameter. This may indicate a carry-over of yolk sac infection. In another case Colisepticaemia was also diagnosed in four-day-old broiler chicks where there had been 3% mortality in a group of 17,500.
Histomoniasis (Blackhead)
Histomoniasis was frequently reported during the month. In one case it resulted in suspicion of notifiable disease. Shrewsbury reported a case in which 24 point-of-lay pullets were purchased and added to a small back yard flock. Within one to two days of arrival some of the birds began to show signs of upper respiratory disease. There was an apparent good response to antibiotic treatment. However, signs recurred in approximately 12 of the birds, which had upper respiratory disease and diarrhoea. Pigeons that roost on the poultry sheds were also reported to be showing signs of illness. Due to the history and clinical signs, the Animal Health Divisional Office was alerted regarding the possibility of a notifiable disease. Out of 60 birds in the flock, 25 appeared affected. One live six-month-old Warren pullet was submitted to Shrewsbury for post-mortem examination. Extensive circular pale yellow lesions were present throughout the liver suggestive of histomoniasis, and histological examinations confirmed this. Winchester diagnosed an outbreak affecting two female 8 to 10-week old white feathered turkeys with a history of lethargy prior to being found dead and Langford diagnosed the condition affecting seven out of a group of fifty Christmas turkeys which had exhibited anorexia and diarrhoea with three birds dying. The birds had almost fluorescent yellow diarrhoea and at post mortem there were white nodular focal lesions present within enlarged livers. Bury, Sutton Bonington and Starcross also reported cases.

Red Mite (Dermanyssus gallinae)
Sutton Bonington investigated a case of in which over a seven-day period between 80 and 100 out of of a group of 1500, 22-week-old pullets died. They had been purchased and placed in cages six weeks before. Pallor of combs was the only sign noted before death. Post mortem examination of affected birds demonstrated severe anaemia and the presence of significant numbers of mites.

Gamebirds
Following on from last month there were further reports of Spironucleus (Hexamita) infection. Two live and one dead 12-week old pheasant poults were submitted to Winchester as part of an investigation into lethargy and diarrhoea. Mortality had reached 1% in a group of 2,500 birds. Post mortem examination revealed scant food material in the alimentary tract and distension of the caecae with a large quantity of ochre yellow coloured liquid content. The carcases were dehydrated. Intestinal smears confirmed the presence of large numbers of Spironucleus (Hexamita) organisms, with scant numbers of coccidial oocysts also seen. Bury also diagnosed the diseases as the cause of death of 600 out of 2000 19-week-old red-legged partridges over a period of approximately six weeks. Loss of body condition and weakness were described. At post-mortem examination carcases were found to be dehydrated with evidence of diarrhoea and Hexamita species were detected in the intestines. Crop candidiasis was also present.

Clostridium colinum
Bury diagnosed Clostridium colinum infection in a group of 800 seven-week-old red-legged partridges. Losses of 120 birds were described. Post mortem examination revealed multifocal hepatic necrosis associated with bacteria
together with necrotic enteritis and caecal casts. Coccidiosis and an acute multifocal septic necrotic hepatitis thought to be due to *Clostridium colinum* was confirmed histologically.

**MISCELLANEOUS SPECIES**

**Dermatophilosis in Alpacas**
A skin scraping was received from a three-week-old female alpaca, which was one of a group of 20. Two were affected with scabs on the nose and ears. *Dermatophilus congolensis* was isolated from the sample. Culture for ringworm revealed *Trichophyton terrestre* which is an unusual isolate. It is regarded as a geophilic organism which may reflect environmental contamination.

**Fasciolosis in an Alpaca**
An aged alpaca died following a prolonged period of weight loss and weakness. It was the only one in a group of nine that appeared affected. Clinically, it had also appeared anaemic. At post-mortem examination the liver was grossly abnormal with abscessation and fibrin present on the surface. Adult and immature fluke were present in thickened bile ducts.

**Salmonellosis in Alpaca**
A four-week old alpaca cria had been found recumbent with signs of colic. It deteriorated rapidly in spite of treatment with antibiotics and anti-inflammatory drugs and was referred to the RVC dying soon after arrival. Post-mortem examination revealed generalised congestion, multiple haemorrhages and an enlarged liver that were consistent with septicaemia. Additionally, a localised ulcer was found in the caecum raising the suspicion of a possible *Salmonella* infection. *Salmonella typhimurium* was isolated in a septicaemic distribution from heart blood, liver and intestinal contents. Three further Alpaca crias were showing signs of disease but recovered with antibiotic treatment. No *Salmonella* organisms could be isolated from swabs taken from these cria. A *Salmonella* advisory visit was carried out and identified wild birds as the most likely source of infection. Advice was also given regarding the chicken and ducks being kept in close proximity to the alpacas.

**Copper Deficiency in Deer**
Joint pathology indicative of osteochondrosis associated with copper deficiency was diagnosed in a two-and-a-half-month-old red deer calf which presented with swollen hock joints and a ‘bunny hopping’ gait. Only the calves were affected in a group of 400 hinds and calves and joint swelling had been reported in both hind and front limb joints. Liver copper analysis revealed a concentration of 28 umol/kg DM (reference range 300-5000 umol/kg DM).
WILDLIFE

*Capillaria* Infection in Hedgehogs
Examination of a faecal sample from a juvenile hedgehog revealed 14,500 *Capillaria* species eggs per gram. Diarrhoea with mucus and blood was reported in a group of juvenile hedgehogs at a wildlife rehabilitation centre.

**Corvid Respiratory Disease**
Seven dead rooks (*Corvus frugilegus*) were submitted to Thirsk RL as part of an investigation into high mortality. The history reported clinical signs of inability to fly and the presence of obviously 'sick' birds around a small copse on a large outdoor pig unit.
At least 20 birds (all rooks except for one seagull) were found dead in the three weeks prior to submission of these carcases. Body condition was poor to moderate. Gross post-mortem examination revealed lesions consistent with *'Corvid Respiratory Disease'* a condition first reported by the SAC VS in 2002-3. Cases fitting the definition of this syndrome continue to be reported periodically although the aetiology remains obscure.