VLA MONTHLY SURVEILLANCE REPORT
JUNE 2007

Highlights

- Border disease virus causing abortion in a suckler cow
- Vet and farmer succumb to Salmonella Enteritidis infection
- Outbreaks of White Muscle Disease in calves
- Nematodirosis and hemonchosis causing losses in lambs and ewes
- Atypical lesions in a case of PMWS/PDNS
- Mortality in Gamebirds caused by rotavirus, Salmonella pullorum and hexamitosis
- Duck virus enteritis in waterfowl

CATTLE

Reproductive diseases

Iodine Deficiency
Penrith investigated four stillbirths which had occurred in a herd of 150 Limousin cattle over a two-week period. A male calf weighing 33kg was presented for post-mortem examination. The calf had an enlarged thyroid gland, which weighed 33g. Thyroid iodine levels measured 148mg per kilogram dry matter (reference range >1200mg/kg). The thyroid iodine level and thyroid weight were consistent with iodine deficiency as the cause of stillbirth.

In a case investigated by Preston six stillborn calves had been born in an Aberdeen Angus suckler herd over the previous 3 weeks. Pooled plasma inorganic iodine analysis gave a level of 5 nag/ml (reference range 105-287 nag/ml) supporting a diagnosis of iodine deficiency.

Border Disease Virus
Two sucklers in a group of 18 cows aborted at around 8 months gestation, followed by a third calving a small weak calf which died within 4 hours. Post mortem examination of this calf at Shrewsbury revealed no significant gross pathology and no significant bacteria were isolated, however Border disease virus was identified using an RT-PCR for pestiviruses on thymic tissue. The source of infection can not be confirmed but considered most likely to be the
flock of 250 ewes on the farm with replacement rams and ewes being purchased each year.

**Enteric diseases**

**Salmonellosis**
Penrith diagnosed *Salmonella dublin* infection on five occasions this month. In one case there had been a period of 24 hours of illness including fitting, followed by death of two, week-old, Limousin-X calves. *Salmonella dublin* was isolated in pure growth from the brain, spleen and liver of a calf presented for post-mortem examination.

Shrewsbury investigated three outbreaks of *Salmonella Typhimurium* dt104 infection. On the first farm which comprised a herd of 75 cows, cows were regularly purchased from markets and were thought to be the source of infection. The second outbreak occurred in a recently purchased calf on a 66 cow organic suckler farm. The third outbreak was in suckler calves which presented with diarrhoea at around 10 days of age.

A vet and a farmer’s son developed a pustular dermatitis and severe gastrointestinal symptoms after they assisted a heifer with dystokia. *Salmonella Enteritidis* was isolated from the heifer, and another group D Salmonella was cultured from a second heifer in the group with severe diarrhoea. As cases of human illness were associated with this salmonella outbreak, local public health officials were involved and Luddington carried out an investigation and advised on farm disease control. Salmonella was isolated from a faecal sample of the vet, but no further typing was undertaken by the hospital. Both human cases made a slow recovery; however one of the heifers died.

**Idiopathic necrotising Enteritis**
A 3 month old Belgian Blue cross Limousin suckler calf was submitted to Preston for post-mortem examination with a history of pyrexia and diarrhoea. It was the only one of 30 to be affected but 20 of the group had also shown a change in coat colour from black to brown over the previous weeks. Post-mortem examination together with subsequent histopathology indicated a diagnosis of idiopathic necrotising enteritis of suckler calves.

Langford also reported a case involving a well grown two month old Simmental heifer suckler calf which was submitted for post mortem examination after dying with severe scour.

**Stomach Fluke**
An unusual finding this month was the demonstration of stomach fluke eggs in the faeces of a three-year-old cow with a history of coughing. The parasite was confirmed as *Paramphistomum cervi*. The significance of the finding in relation to clinical disease is not known and it may be an incidental finding. Immature stomach flukes are capable of causing clinical disease in cattle in cases of heavy infection.

**Respiratory Diseases**

**Laryngeal Necrobacillosis**
Sutton Bonington diagnosed an outbreak of laryngeal chondritis associated with *Fusobacterium necrophorum* affecting calves aged about four to six
weeks in a purebred South Devon suckle herd. Soon after turn-out, they began to be found lying under a hedge or standing with necks outstretched. Eight were affected by stridor but pyrexia was detected in only one. One died within 24 hours of being seen ill but others were affected for weeks with no improvement despite treatment with antibiotics including tetracycline, tylosin, tulathromycin and fluoroquinolones and with anti-inflammatory drugs. Two which died after being affected for at least four weeks were submitted for post-mortem which revealed a septic necrotising laryngitis involving the laryngeal cartilage. There was enough evidence to suggest likely primary *Fusobacterium necrophorum* infection within necrotic cartilage. A calf which had been affected for weeks and treated unsuccessfully with several antibiotics responded to treatment with penicillin and sulfathiazine. No classical predisposing factors for necrobacillosis were identified.

Leahurst also diagnosed a case involving a four week old calf initially presented with contracted tendons which was hospitalised for treatment. It developed diarrhoea and pneumonia with respiratory noise and subcutaneous oedema was observed around the larynx.

**IBR**

Sutton Bonington investigated an outbreak of IBR on a unit, which raises Friesian bull calves from a dairy herd to 18 months of age. A newly purchased stock bull had been housed with the calves three weeks before the outbreak.

**Musculoskeletal Diseases**

**White Muscle Disease**

The carcase of a three month-old Aberdeen Angus X suckler calf was submitted to Thirsk for post-mortem examination following an outbreak of pneumonia in suckler calves of 3-4 months of age in a 130-cow herd recently turned out to grass. Post mortem examination revealed evidence of severe myopathy indicating white muscle disease.

Sutton Bonington also diagnosed the condition following post-mortem examination of a six-week-old suckler calf which had died following a two-week period of malaise which included intermittent scouring, episodes of respiratory distress and locomotory difficulties. Eight calves in a group of 30 had been affected and six had died. Clinical signs amongst these had varied, and included being very weak at birth with later respiratory problems, scouring, blindness and older calves developing an unusual gait.

Shrewsbury also described a case affecting one of two suckler calves aged around 3 months which were found recumbent. One of the calves was reported to have passed pink coloured urine.

**Malignant oedema**

Three of a group of 35 Limousin cross 18-month-old beef finishers at grass died within a week of each other. The first two animals died suddenly with no premonitory signs. The third animal was submitted for post-mortem examination, having been found with an extremely swollen head. This had obscured its vision, and it had wandered into and got stuck in a stream. Post-mortem examinations revealed the head to be extremely swollen, with subcutaneous oedema which was purplish, with thickening of the skin,
especially periorbitally. The eyes could not be seen due to the degree of swelling, and a fibrinous exudate was observed coating the eyelashes. Impression smears made from the soft tissue fluid revealed strong fluorescence against *Clostridium chauvoei*. This organism was also cultured anaerobically. The gross post-mortem appearance of malignant oedema affecting the head is an unusual manifestation of disease caused by *Clostridium chauvoei*.

**Metabolic Diseases**

Hypocupraemia was diagnosed as the cause of ill thrift and scour in a group of three-month-old beef suckler calves at pasture with their dams. Five were affected in a group of ten calves; a few were moving stiffly and some joints felt thickened on palpation. Mean plasma copper concentration for four sampled calves was 1.85 umol/l (normal range 9-19µmol/l). Faecal samples had been submitted from the group for parasitology and culture with no significant findings.

Preston identified marked hypocupraemia in 2 month old Limousin beef suckler calves presenting with diarrhoea. 5/30 were affected and four had died. Blood copper concentrations submitted from one case gave values of 1.2mmol/l (reference range 9-19mmol/l). It was felt the low copper levels may have played a part in the diarrhoea but whether it had directly attributed to the death of some of these calves is unknown.

**Poisoning**

**Lead Poisoning**

Penrith diagnosed lead poisoning in 8-month-old dairy heifers. Two out of 26 animals had died. The farmer suspected plant intoxication despite knowing that there were six tractor batteries in the field, one of which had deteriorated significantly.

**Botulism**

Thirsk investigated an outbreak of botulism affecting a group of 60 yearling beef cattle. Seven animals were affected by progressive flaccid paralysis six of which were submitted for post-mortem examination which revealed few gross lesions. Farm investigation revealed the presence of poultry litter 200m from the affected field. There was evidence of translocation of poultry carcase material by vermin and crows which had been carrying it back to their nest. Two samples of litter forwarded to CIDC Lelystad both contained *Clostridium botulinum* type D toxin.

**Other Diseases**

**Chronic Fibrosing Cardiomyopathy**

A 14 months old Holstein heifer presented to Leahurst with dyspnoea, distension of jugular veins and brisket oedema. At necropsy examination there were pleural and pericardial effusions, ascites, oedema of the ventral subcutaneous tissues, lungs, omentum and mesentery. These lesions were highly suggestive of heart failure although the heart was grossly unremarkable. Histopathological examination of cardiac tissue revealed severe chronic fibrosing cardiomyopathy. In young Holstein-Friesian cattle a
cardiomyopathy which is thought to be autosomal recessive in nature has been reported (Nart and others, 2004).

**Clostridium Perfringens Encephalopathy**
A dairy heifer that had calved 7-10 days previously developed sudden onset recumbency with extensor rigidity and opisthotonus with reduced jaw and tongue tone. The pupils were fixed and dilated. It had tachycardia, pyrexia and a mild metritis. It was euthanased and submitted to Leahurst for post mortem examination. Gross pathological findings, biochemistry and haematology were unremarkable, however, histopathology revealed severe necrotising encephalopathy with cerebral vasculopathy. The lesions in this case were consistent with a diagnosis of *Clostridium perfringens* enterotoxaemia.

**Staph Aureus Dermatitis**
Swabs were submitted to investigate the cause of severe skin rashes and cutaneous abscesses on the necks of 20 out of 300 dairy cows. The distribution of the lesions was associated with identity collars. These had been used on the farm for at least a year but had only caused a problem in the last few weeks. Heavy pure growths of *Staphylococcus aureus* were isolated from the lesions in one case and mixed growth including *Staphylococcus aureus* and *Streptococcus dysgalactiae* in another.

**Ichthyosis Congenita**
*Ichthysis congenita* was diagnosed following post-mortem examination of a very stunted 12 week old Friesian heifer at Langford. Histological examination of skin revealed an exuberant lamellar orthokeratosis of the stratum corneum. There was also mild ectasia of hair follicles and sweat glands. The lack of parakeratosis together with the biochemistry mitigated against hereditary zinc deficiency.
SMALL RUMINANTS

Enteric diseases

Nematodirosis
Penrith diagnosed nematodirosis in a 4-week-old Swaledale lamb from a group exhibiting diarrhoea and occasional deaths over the period of a week. In another case parasitism was also suspected in a group of 3-month-old lambs with sudden death as the presenting sign. Three carcases submitted for post-mortem revealed profuse watery small intestinal contents and total worm counts of 8000 *Nematodirus battus* worms present in the intestinal washings from one of the lambs. No other cause of death was established. Newcastle necropsied a two-month-old Bleu du Maine lamb with a history of scouring and ill thrift prior to death and diagnosed Nematodirosis on detection of a worm count 80,000 *Nematodirus battus*. Winchester diagnosed the condition in six, 9 week old Texel cross lambs which were submitted as part of an investigation into increased mortality within a large group of lambs. Figure 2 shows the incidence of Nematodirosis in lambs to be lower than the previous year.

![Figure 2: VIDA Incidents of Nematodirosis in sheep as % of diagnosable submissions April-June 1999-2007](image)

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Vertical bars represent 95% confidence limits

Haemonchosis
Winchester diagnosed four incidents of haemonchosis. In the first the carcase of an adult ewe was submitted to Winchester for post mortem examination with a history of submandibular oedema followed by death. Five ewes from a flock of 600 were affected with 2 deaths. The carcase was in good bodily condition with evidence of marked submandibular oedema (bottle jaw). The conjunctival mucous membranes were extremely pale in colour. Post-mortem examination revealed trichostrongyle-type worm egg count of 48,400 eggs per gram and approximately 65,700 predominantly *Haemonchus* worms in the abomasum confirming a diagnosis of haemonchosis. The second involved the deaths of 7/115 animals and in the third 11 out of a group of 160 had died...
suddenly. The fourth case involved the loss of 5/115 ewes and a mixture of Haemonchus, Telodorsagia and Cooperia worms were identified at post mortem.

**Respiratory Diseases**

**Mannheimia Haemolytica and Mycoplasma ovipneumoniae**

Penrith reported four outbreaks of disease associated with *Mannheimia haemolytica* including a case in which four sudden deaths in a group of 180 lambs had occurred and another case where *M haemolytica* was isolated with subsequent histopathology confirming concurrent atypical pneumonia due to *Mycoplasma ovipneumoniae*.

A ewe was received for post mortem examination from a flock with a history of respiratory signs. Fifteen animals had died out of a group of 53. Post mortem examination confirmed consolidation of the cranio-ventral lung fields and both *Mannheimia haemolytica* and *Pasteurella trehalosi* were isolated, together with *Mycoplasma ovipneumoniae*. There was a history of nasal discharge in the ewe and a single *Oestrus ovis* larva was found within the turbinates and, in the course of examining the brain, another larva was found on the surface of the brain (Fig 3) having originated from the frontal sinuses. Pus was present in the sinus adjacent to one of the horns and within the horn base itself due to the activities of the larvae.

Figure 3.
*Oestrus ovis* larva on the surface of the brain

**Corynebacterium pseudotuberculosis**

An acute multifocal pneumonia associated with caseous lymphadenitis caused the sudden death of a seven-year-old ewe in a field with a group of 140 sheep. There was a large consular abscess and abscessation of the
caudal mediastinal lymph node. Both lungs were purple and firmer than normal with patchy darker purple areas. Within the caudal lobe of the right lung there were two large pale firm foci each of which was bordered by a haemorrhagic zone. *Corynebacterium pseudotuberculosis* was isolated from the lungs and caudal mediastinal lymph node.

**Nervous Diseases**

**Louping Ill**

A 12-month-old Cheviot was submitted to Penrith from a group of 22 hoggs where two deaths had occurred. Affected sheep had shown signs of lethargy, trembling and a leaning gait. The area was recognised as a tick habitat. Post-mortem examination revealed congestion, pleural effusion and sanguineous free fluid in the pericardial sac. Louping ill serology demonstrated a titre of $\geq 1/640$ and the majority was identified as IgM, suggesting recent infection. Histopathology confirmed a subacute viral type necrotising polioencephalitis.

In another case investigated by Starcross five yearling Scottish ewes out of a group of 150 suddenly developed symptoms of inco-ordination and recumbency. A blood sample submitted by post from one of them showed a high level of antibody (1/1260) to Louping-ill virus by HAIT. The majority of the antibody was found to be IgM which is the earliest antibody to appear, confirming recent infection with Louping-ill virus.

**Other diseases**

Following a history of recurring vaginal and rectal prolapses after lambing, a two-year old ewe was euthanased and submitted to RVC. Post-mortem examination revealed the increased straining and the subsequent prolapses could be attributed to severe changes in both kidneys: they were markedly swollen with multi-focal white lesions up to 5mm in diameter throughout the renal cortices. The renal pelves and the ureters were dilated and contained a large amount of necrotic debris. A diagnosis of suppurative embolic glomerulonephritis and pyelonephritis was made and *Corynebacterium renale* was isolated from a swab of the kidneys.

Shrewsbury isolated *Staphylococcus hyicus* and *Corynebacterium pseudotuberculosis* (CLA) from swabs taken from skin nodules. Five ewes in a group of 150 were affected. Skin lesions were noticed on the face and neck of the ewes prior to shearing. A skin lesion on a tup was noticed post shearing.

**Enteric diseases**

**Swine Dysentery**

Bury diagnosed swine dysentery as the cause of severe scour with some mucus and blood in 15% of 600 18 week-old finishers with just two deaths; *Brachyspira hyodysenteriae* was cultured from submitted faeces and the large intestine of a dead pig. Preston also investigated two outbreaks of
swine dysentery— one in weaned piglets and one on a unit where several age groups of pigs were reported to be scouring.

**Colibacillosis**
Scour, pyrexia, malaise and wasting were reported in a group of nine 12–week old pigs (three affected). A mixed infection with K88 + *E. coli* and *Brachyspira pilosicoli* was identified.

**Salmonellosis**
Three pigs were submitted to Bury to investigate a recurrent problem in weaners. Diarrhoea and weight loss had been occurring in an outdoor breeding unit when animals were moved to different nursery-finisher units from around seven weeks old. In the most recent outbreak 60 of 300 pigs had been affected with 16 deaths. Post-mortem examination revealed acute gastritis in two pigs, and in one, there was focal gastric ulceration near the pylorus. All three pigs had diffuse diphtheritic typhlocolitis of variable severity with severe watery brown to yellow scour, in one pig lesions also involved the small intestine. Group B salmonellas were isolated from intestines and livers pointing to a diagnosis of salmonellosis. The breeding unit had both a salmonella and PRRSV problem the previous year and the possibility of continuing involvement of PRRSV infection is being investigated. Thirsk isolated *Salmonella Typhimurium* phage type 193 from two separate bags of shavings that were going to be used as bedding for finishing pigs in straw yards. These shavings originated from gallops (training tracks for racehorses) in the vicinity of the pig unit. It is uncertain whether the salmonella contamination of the shavings originated from the horses using the gallops or possibly from birds. Advice, nevertheless, was not to use these shavings in future, as the isolated salmonella strain is a common cause of salmonellosis in pigs.

**Respiratory Diseases**
A 12-week-old pig dying suddenly was submitted to Bury from an indoor breeder-finisher unit with an ongoing problem of high mortality of approximately 7% after pigs moved to finisher accommodation, due to respiratory disease, wasting, PDNS and sudden deaths. Pigs were vaccinated for *Mycoplasma hyopneumoniae*, *Haemophilus parasuis* and PRRS virus. The submitted pig was in fair body condition with a purulent rhinitis, tonsillar necrosis, a localised fibrinous pleurisy associated with a sub pleural abscess and patchy consolidation involving dorsal parts of the caudal lung lobes. *Actinobacillus pleuropneumoniae* and PRRS virus were isolated. Histopathology revealed significant involvement of PCV-2 in the pneumonia and immunohistochemistry confirmed concurrent involvement of PRRS virus infection in pneunomic lesions.

**Other diseases**

**PMWS**
A pig was submitted to Thirsk for post-mortem examination to investigate a sporadic problem affecting 16 week old pigs. Affected pigs showed development of black discoloured circular spots in the skin of their backs. Following the development of the spots, the affected pigs would show ill thrift
for a while, after which some would start to recover but some affected pigs would die. The attending veterinarian did not consider the lesions to be typical of PDNS, as the distribution of the skin lesions did not include the ventral body or the limbs. The post-mortem examination of the submitted pig revealed a large number of discrete spots and purple coloured lesions present on the skin on the dorsum of the pig. Some of these lesions were round in shape with an area of black discoloured hard skin or crust. The size of these lesions ranged from 0.5-2 cm in diameter (see Figure 4). Subsequent histology demonstrated the skin lesions and the kidney pathology to be characteristic of PMWS/ PDNS.

Figure 4.
Pig with atypical PMWS/PDNS lesions

BIRDS

Gamebirds
Bury investigated an outbreak in which 100/2000 eight-week-old partridges died over ten days with diarrhoea and wasting, and showed a poor response to treatment for coccidiosis. Four live birds were submitted in poor body condition and dehydrated. Significant numbers of coccidial oocysts were detected in all the birds, three of which also had focal ulcerative intestinal lesions suspicious of *Clostridium colinum* infection. Histopathology strengthened the suspicion of *Clostridium colinum* infection revealing a multifocal ulcerative enteritis and subacute septic hepatic necrosis and evidence of previous caecal coccidiosis with casts present in the caecal lumen. However, the organism is particularly difficult to culture and was not isolated. The coccidiosis may have precipitated the clostridial necrotic enteritis. In addition, *Salmonella* Orion was isolated from the intestines of one bird.

Starcross investigated a peak in mortality of a batch of 22,000 pheasants which started at six days of age. 1,500 chicks had died. The birds showed loose faeces and a pool of intestine contents was positive for rotavirus. In a second batch of 22,000 pheasants on a different farm 2,500 chicks died.
Deaths on this farm also started at around six days and again rotavirus was present in pooled intestine contents.
An escalating mortality in a group of 2,500 two-week-old red-legged partridges was investigated. Many small chicks had been noted at hatching. Post mortem showed enlarged liver and spleen with miliary white foci in the liver. Culture isolated *Salmonella Pullorum*.
Winchester identified large numbers of *Hexamita* protozoa in intestinal smears from 3-4 week old pheasant poults. Mortality amongst the group of around 2000 birds was estimated to be 15%, with most birds being found dead. The birds examined had a mean weight of 78g, which is well below the expected weight of 120-200g for birds of this age.

**Waterfowl**
Following the deaths of eight birds out of group of fifty ornamental ducks, two were submitted to Langford for post mortem examination at which typical signs of Duck Virus Enteritis (DVE) were found including diphtheritic annular lesions in the small intestine and longitudinal diphtheritic lesions in the anterior oesophagus. A cytopathic agent consistent with DVE was found in pooled tissues.
The cause of increasing numbers of deaths (approximately 300 out of 2,400 birds in total) in ducklings a few days old and in a group of approximately 4 week old ducks was also diagnosed as DVE by Winchester.

**WILDLIFE**

**Squirrel Pox**
Squirrel pox was diagnosed in a red squirrel (*Sciurus vulgaris*) from an area near Carlisle where previous cases have been identified by VLA during 2007. *Staphylococcus aureus* was cultured from the conjunctival lesions and also from the liver, suggesting the presence of a bacteraemia arising from staphylococcal infected pox lesions in the skin.

**Greenfinches**
Considerable numbers of greenfinch deaths in a garden were reported to Bury. One bird was submitted for post-mortem examination which revealed the presence of multifocal yellow raised plaques in the oropharynx, crop and oesophagus along with a pneumonia. The lesions were consistent with trichomoniasis.

**Ferret Splenomegaly**
An adult ferret was submitted for post mortem examination from an animal park to investigate the cause of sudden death. At post mortem examination blood clots were present within the abdominal cavity with a dramatically enlarged and congested spleen with evidence of rupture of the capsule. Histological examination of the spleen revealed hypercellularity with marked erythropoiesis but no evidence of neoplasia thus a diagnosis of ferret splenomegaly was appropriate. This is a well recognised condition but with unknown aetiology although a link with chronic gastric Helicobacter infections has been suggested.