Highlights

- Parasitic gastroenteritis causing losses in both calves and lambs
- Further outbreaks of Haemonchosis in sheep
- Traumatic reticulitis in cattle caused by tyre wires remains a frequently diagnosed condition
- Increased outbreaks of Lungworm in cattle
- Greasy pig disease caused by Staphylococcus chromogenes
- Losses in Gamebirds caused by Spironucleosis
- Abortion in Alpaca caused by BVD virus

CATTLE

Enteric diseases

Parasitic Gastroenteritis (PGE)
Penrith diagnosed PGE in a 10-week-old Limousin-X calf which had been at pasture for three weeks before developing diarrhoea. Parasitological examination revealed 5100 trichostrongyle eggs per gram faeces and 1700 coccidial oocysts.
Langford diagnosed PGE on eight occasions in six to twelve month old calves. Trichostrongyle sp. worm egg counts of up to 4,550 epg were detected. In one case investigated all twenty of a group of 6 – 8 months old Holstein Friesian heifer calves had developed diarrhoea with one subsequently dying. Truro also diagnosed Parasitic gastroenteritis in a group of 6 month-old Ayrshire cross calves in a dairy herd which resulted in the deaths of 15 out of a group of 45.

Salmonellosis
Shrewsbury diagnosed Salmonella Typhimurium infection on three premises. An untypable variant was recovered from faeces of 2 cows with diarrhoea,
one of which also exhibited milk drop. In the first case S. Typhimurium dt193 was isolated from the carcase of a 6 week old suckler calf which died rapidly after developing recumbency; only 1 animal was reported to be affected in the herd of 120 animals. The third case (also phage type 193) was in neonatal dairy calves with 6 affected and one death reported. Carmarthen also investigated an outbreak of Salmonella Typhimurium in a 250 cow dairy herd. There had been no recent purchases and no contact with neighbouring stock. The most likely source of infection was contamination of feed by wildlife particularly rats which were seen feeding on spilt grain and birds which had contaminated food stores with faeces from which the organism was subsequently isolated.

**Traumatic Reticuloperitonitis**
Langford reported that traumatic reticuloperitonitis had accounted for 63% (29/46) of the diagnoses reached on cow post-mortems at Langford during the year. The majority had been caused by “tyre wires” and represented and avoidable loss to the farms concerned. In one particular case, post mortem examination of a four year old dairy cow revealed the pericardial sac to be three times normal size due to haemopericardium and a deposition of fibrin up to 2 cms deep over the heart. In a further incident two out of herd of 200 dairy cows died with few premonitory signs. Post mortem of one carcase submitted revealed large blood clots within the rumen and reticulum. A 2 cm diameter hole was found in the reticular mucosa from which blood and pus were leaking and encapsulated in this hole was a length of tyre wire approximately 5 cms long. This hole was adjacent to a branch of the ruminal artery and it appeared that the wire had perforated the artery resulting in death due to blood loss. Additionally there was a large aortic thromboembolism caudal to the renal arteries which may well have been part of the same pathogenesis.

**Respiratory Diseases**

**Lungworm (Dictyocaulosis)**
Penrith diagnosed Lungworm on three occasions; once in an adult dairy cow that died with a secondary A pyogenes pneumonia, once in a 3-year-old dairy heifer and also in a 6-month-old calf. The latter case involved a group of 25 fattening calves at grass in which most of the calves were coughing and three had presented with more severe respiratory signs. One calf died and at post-mortem lungworm were found in all the major airways including the nostrils. Five cases of lungworm were confirmed by Starcross during the month, all in dairy herds. On one farm, up to 40 Holstein-Friesian cows in a herd of 85 had acute onset coughing, one developing severe pneumonia and several others with mild pyrexia. In addition there was evidence of exposure to RSV although convalescent samples were not available to confirm active infection. In two other herds, approximately 60 of 120 and 20 of 200 cows developed respiratory signs. In a fourth herd, four cows were persistently coughing despite receiving ‘Autoworm’ boluses at turn out. Thirsk also diagnosed the condition in a herd of 30 Limousin cross suckler cows which presented with coughing and respiratory signs. Some of the calves were affected as well. No lungworm vaccine had been used in the herd.
**Nervous Diseases**

**Enterotoxaemia**
Penrith investigated a case in which two calves in a group of 25 aged two weeks had shown nervous signs including head pressing and terminal convulsions. The second case was presented for post-mortem which revealed navel ill and hypogammaglobulinaemia. Histopathological examination of the brain revealed lesions consistent with damage caused by *Clostridium perfringens* epsilon toxin.

**Hypomagnesaemia**
Starcross investigated two cases of hypomagnesaemia. In the first, two Simmental X suckler cows in a group of 30 died with suspected hypomagnesaemia. A third cow became dull and depressed and a blood sample revealed a serum magnesium concentration of 0.27 mmol/l (ref range 0.7 – 1.3), confirming grass staggers. It transpired that the wrong mineral buckets had been put out in the field in which the cattle were grazing. In a second case, a five-year-old Aberdeen Angus X Friesian cow died suddenly, two days after being moved on to a new field where the grass was slightly more lush. In this case access to suitable minerals had been available.

**Other Diseases**

**Bracken poisoning**
Leahurst investigated a group of two-year-old beef fattening cattle which had been grazing heath land where bracken was present since mid-April. Three animals were found dead during a 24 hour period and others were looking ill. When these were examined by the private veterinary surgeon they were found to be severely pyrexic with temperatures of 105 –107°F. One of these was euthanased and submitted for post mortem examination. Gross pathological findings were of petechial haemorrhages in the musculature surrounding the larynx and beneath the trachea, in the mucosa of the sinuses and on the myocardium. The retropharyngeal lymph nodes were enlarged. Haematological examination revealed a total white blood cell count of 0.7 x10^9/l (ref. range 4-12 x10^9/l), neutropaenia, lymphopaenia and thrombocytopaenia. Bracken poisoning was diagnosed.

**Babesiosis**
A four-year-old South Devon Cow was presented to Starcross for post-mortem after dying suddenly. The farmer had lost one cow per year in similar circumstances for four years. All deaths occurred in the summer/early autumn, within quarter of a mile of each other on an area of common land. On post mortem examination, two *Ixodes ricinus* ticks were found attached near the udder. In addition, there was hepatomegaly with bile duct mineralization, infestation with adult fluke, localised anterior pulmonary emphysema, splenomegaly and dark brown, turbid urine. No blood parasites could be seen on blood smears, but redwater was nonetheless suspected. Histopathology revealed a severe periacinar necrotising hepatopathy and severe acute to subacute nephropathy, consistent with intravascular haemolysis. Organisms highly suspicious of *Babesia* also were found in meningeal intravascular erythrocytes.
**Fatty Liver Syndrome**
Luddington investigated a case in which fifteen to twenty dairy cows in a herd of 150 had shown signs of malaise, recumbency and/or retained placenta’s. All affected cows had been recently purchased and had been over fat prior to calving. One cow was submitted for necropsy four days post calving; findings included a severe endometritis and grossly elevated BHB levels in a blood sample collected ante mortem. Histology identified hepatic lipidosis. Ten blood samples from dry cows in the same herd were submitted and seven of these had elevated Non Esterified Fatty Acid (NEFA) levels ie >600 μmol/l. Fatty liver and ketosis predispose for periparturient disease and it was advised to review the dry cow management.

**Malignant Catarrhal Fever (MCF)**
The cutaneous form of Malignant Catarrhal Fever virus infection was diagnosed by Carmarthen in a six month old Aberdeen Angus calf. The animal had been ill for two weeks, and had skin lesions, including ulceration and pyoderma, that did not resolve with antibiotic treatment. Skin samples had been examined for ectoparasites, and found to be negative. A subsequent blood sample was positive by IFAT for antibodies to the OvHV-1 strain of MCF virus.

**SMALL RUMINANTS**

*Enteric diseases*

**Parasitic Gastroenteritis (PGE)**
Parasitic gastroenteritis was widely reported. Bury reported PGE to be the most common cause of sheep diagnostic submissions. They investigated a case in which there had been a 10% mortality in a group of 300 ewes & lambs. The lambs were scouring and the ewes ill thriven. A lamb in poor bodily condition underwent post mortem examination and parasitic gastroenteritis was confirmed. There were 9600 *Teladorsagia* (*Ostertagia*) species and 7200 *Trichostrongylus* species in the abomasum. In the small intestine there were 1200 *Trichostrongylus* species and 700 Nematodirus worms. In addition the liver copper concentration was low at 227 µmol/kg DM (reference range 300 – 8000 µmol/kg DM). Intestinal parasitism can interfere with mineral absorption and this may have caused this low result. Winchester reported Parasitic gastro-enteritis as the cause of diarrhoea and deaths in a group of 400 organically reared sheep. The flock had lost 11 ewes and 15 lambs in the previous 2 weeks before the use of anthelmintic had been instigated. A submission of abomasal content from 2 sheep both showed *Teladorsagia* (*Ostertagia*) species, with one also showing *Trichostrongylus* species. Worm egg counts on two faecal samples also submitted showed different levels of infestation, with one having 100 epg and the other 4,150 epg. Shrewsbury detected evidence of benzimidazole resistance in *Ostertagia* spp, *Trichostrongylus* spp and *Haemonchus* spp in a submission from a flock in Herefordshire using an in-vitro test for anthelmintic resistance currently offered by the VLA.
Haemonchosis was identified in a number of outbreaks. Thirsk reported a particularly severe outbreak affecting a group of 80 pedigree Charolais ewes three weeks after a move onto what is now suspected to be heavily infected pasture. Ewes and lambs were all wormed with a combination product containing triclabendazole and levamisole some 24 days prior to submission. Three weeks after this, approximately 10% of the flock were affected at various stages with clinical signs of depression, recumbency, submandibular oedema, and ‘sudden’ death. At post-mortem examination, severe pallor of conjunctival and vulval mucous membranes was evident (Figure 2), gelatinous submandibular oedema was marked, and patchy hepatic fibrosis suggested resolving fasciolosis lesions. 47,700 immature *Haemonchus contortus* worms were found in the abomasum of one ewe; the prepatent nature of the infestation was underlined by the relatively low faecal worm egg count (300 eggs per gram). Adult worms seen were all *Teladorsagia circumcincta*. The prepatent period of both worms is similar, at 16-21 days.

**Figure 1.**
Ewe affected by Haemonchosis showing extreme pallor of the conjunctival mucous membranes
**Other diseases**

**Sarcocystosis**
A 1-year-old Texel lamb was submitted live to Newcastle for post-mortem examination. It had been shown signs of ataxia for a period of one month. There were 28 rams running together in the group and one other was said to be similarly affected. On submission, the lamb was seen to be unsteady on its legs. It was reluctant to go forwards but rocked from side to side when standing. Histopathological examination revealed a mild to moderate non-suppurative panencephalitis throughout the brain but particularly involving the brain stem. The character and distribution of the encephalitis, together with the presence of protozoal clusters, was consistent with Sarcocystosis infection. Coincidentally a chronic active, low-grade otitis media was present on one side and this was thought to possibly be a consequence of extension of an upper respiratory tract infection.

**Mycoplasma conjunctivae**
Bury investigated a group of 40 ewes which were affected with recurring conjunctivitis, corneal oedema and ulceration over approximately a four-week period. There was short term response to topical treatment and parental long-acting oxytetracycline. A standard culture of a conjunctival swab resulted in a growth of likely contaminants and commensals. The submission of five pooled conjunctival swabs in mycoplasma broth resulted in the identification of *Mycoplasma conjunctivae* by DGGE. The case history is typical of keratoconjunctivitis due to *Mycoplasma conjunctivae* which can result in a carrier status. Groups of sheep being reared separately on this farm were unaffected and consideration was given to culling the affected group.

**Contagious lymphadenitis (CLA)**
*Corynebacterium pseudotuberculosis* was isolated from three swabs submitted to Starcross from a flock of 55 Suffolk sheep, at least ten of which had developed unilateral or bilateral submandibular abscesses. Two of the ewes which had multiple abscesses were reported to be in poor bodily condition. The flock had been established after the foot and mouth outbreak in 2001 with ewes purchased each year from 2002 to 2005. The first abscesses were noted in one ewe in May 2006.

**PIGS**

**Enteric diseases**

**Salmonellosis**
Bury described several incidents of salmonellosis in housed pigs aged between seven and nine-weeks-old. Clinical histories suggested that concurrent or pre-existing disease may have contributed to salmonella infection causing disease. In one case, 50 of 600 pigs were affected with 30 deaths. The pigs had been scouring earlier in the rearing period, recovered and then diarrhoea reoccurred. Group B salmonellas were isolated from the large intestines of two pigs with necrotic colitis.
In a second incident, 25% of 4400 pigs were affected with chronic coughing and pneumonia and 74 deaths had occurred in the previous week. Of three pigs submitted, one had a necrotic enterocolitis from which group B salmonella was isolated. Investigations continue on the other two pigs submitted which had pneumonia. When the same pigs were 30-days-old, an acute post weaning scour occurred and rotavirus was detected in all of three faeces submitted. Intestinal damage with villus stunting can occur as a sequel to rotaviral infection and this could increase the susceptibility to disease following infection with salmonella.

**Colibacillosis**

Sutton Bonington identified Haemolytic *E. coli* O:138 K:81; VT +ve by verocell assay and VT2 +ve by PCR in the small intestine contents of two recently weaned eight-week-old pigs on a small unit. Four piglets in a single litter died following an acute scour. One died prior to diarrhoea developing and the five remaining scouring piglets responded to antibiotics. The problem was kept under control as it was possible to wean other litters into separate accommodation pending thorough cleansing and disinfection.

**Other diseases**

**Greasy pig disease**

Greasy pig disease was diagnosed as the cause of skin disease in most of a litter of 13 piglets affected since a week-old on a 10-sow indoor breeder-finisher unit. Piglets were reported to be scabby, dirty around eyes and pruritic and one had died. There had been a poor response to ivermectin and penicillin treatment. One live piglet in poor body condition was submitted at 18 days old. The entire surface of the skin was covered with a dark brown waxy exudate with multifocal irregular accumulations as shown in Figure 2. The skin showed abnormal wrinkling and thickening. The face and ears were particularly severely affected. Pure growths of *Staphylococcus chromogenes* were isolated from skin and superficial lymph nodes and no evidence of mange was detected. Histopathology revealed a superficial bacterial pyoderma consistent with greasy pig disease. Possible predisposing factors for the condition, particularly those causing skin trauma were highlighted and the farmer mentioned that this year's new straw which he had just begun to be use was particularly short stemmed and spiky. There was no evidence of PRRS virus infection in the piglet. *Staphylococcus chromogenes* is closely related to *Staphylococcus hyicus* and exudative epidermitis caused by toxigenic *Staphylococcus chromogenes* has been reported in pigs.
BIRDS

Poultry

**Amidostomum anseris**
Six, 14-week-old goslings were submitted to Penrith from a flock where there had been six recent deaths in a group of 13 young birds. The birds lost condition and died over the period however three adult in contacts were unaffected. At post-mortem, *Amidostomum anseris* worms were seen on scrapings of the gizzard mucosa which appeared thickened and slightly necrotic. Histopathology confirmed the presence of gizzard pathology associated with numerous cross sections of nematodes. Preston also diagnosed the condition as the cause of death of a domestic female Red Breasted goose. An area of 0.5x2cm of gizzard koilin was eroded and dark brown, and numerous fine hair-like worms were seen beneath the koilin and burrowing into the adjacent submucosa.

**Mycoplasma gallisepticum**
Carmarthen diagnosed *Mycoplasma gallisepticum* infection as the cause of sneezing in a group of 40 to 45 backyard chickens. Clinical signs started after the purchase of a single bird. The birds had already been treated with tylosin and enrofloxacillin, which had resulted in some improvement. There was an increased amount of mucus in the sinuses of two out of the three birds examined. Serology for *Mycoplasma gallisepticum* was positive but no pathogenic Mycoplasma were demonstrated by DGGE examination, probably due to the previous treatment. *M.gallisepticum* is unlikely to be totally eliminated from the flock by antibiotic treatment and can pass to new chicks via the egg.
**Histomoniasis**

Chronic typhlitis associated with histomoniasis was confirmed in a flock of 32 week old broiler breeders in which moderate mortality (0.3 to 0.5% per week) had been reported over the course of four consecutive weeks. Post mortem examination revealed septicaemic carcases with a small ascarid burden in the upper intestine and markedly thickened chronically inflamed caecae containing a core of caseous material. Although the livers were swollen due to *E. coli* septicaemia, the typical round depressed “target” lesions were not present. Histopathological examination of the necrotic foci in the caecal wall showed small clusters of phagocytes containing remnants of faintly staining PAS positive protozoa presumed to be *Histomonas meleagridis*. Examination of livers revealed lesions associated with acute bacterial septicaemia.

**Gamebirds**

**Spironucleosis (Hexamita)**

Bury diagnosed Spironucleosis (hexamitiasis) on several occasions in pheasants in release pens. Losses of 60 out of a group of 2,000 twelve-week-old pheasants was described and shown to be associated with *Hexamita* species on intestinal smears. However ongoing mortality in this case prompted a further submission of birds which also confirmed the disease. The condition was also described in 9-week-old pheasants with losses of 85 birds out of 1,200.

RVC diagnosed Spironucleosis (hexamitiasis) affecting underweight pheasants submitted for post-mortem. Approximately 50, nine-week old birds died out of a group of 2500 and several more were affected. Additionally, Trichomonas sp., a few coccidial oocysts and secondary bacterial infections were present in some carcases and likely contributed to the demise of birds.

**Tenosynovitis**

Weight loss and leg weakness affecting 20-30 birds in a group of 1,000 seven-week-old pheasants resulted in carcases being submitted for post-mortem examination which revealed tenosynovitis associated with *Staphylococcus aureus* infection. The organism was also isolated from livers suggesting a degree of septicaemia. Osteomyelitis of the proximal tibia was detected in one bird.

**Histomoniasis**

Losses of between 80 and 100, ten week old partridges in a batch of 1,500 prompted the submission of birds to Winchester for post mortem examination. Typical lesions of blackhead (histomoniasis) were identified, with discrete focal necrotic areas in the liver and necrotic caecal cores.

**Salmonellosis**

One hundred nine-week-old pheasants died from a flock of 2000 although up to 25% of the birds were described as being lethargic, losing weight and with reduced appetite. On-farm post mortem examination revealed typhlitis and colitis with inspissated cores of exudate in the mucosa. Previous submissions to Luddington had revealed a substantial *Hexamita* burden. Culture yielded a *Salmonella* Group E2, subsequently identified as *Salmonella* Binza. The isolate was sensitive to all commonly used antibiotics.
MISCELLANEOUS SPECIES

Sarcocystosis in Alpaca
The carcase of an 8 year old female alpaca was submitted for post mortem examination with a history of multiple abscess-like lesions palpable under the skin particularly in the head and neck area. The carcase was in good bodily condition and the reported subcutaneous abscesses could be readily palpated in the neck area. Post mortem examination confirmed multiple, approximately 1 cm diameter, abscesses within the skeletal musculature, particularly in the cervical area, along the ventral abdominal musculature and the muscles of the hind limbs. These abscesses contained dry caseous yellow to cream coloured material. A single 3 cm diameter caseous lesion was found attached to the parietal pleura in the right hemi-thorax. Ziehl-Neelsen stained smears prepared from the abscess material showed no evidence of acid-fast organisms. Microbiological culturing of the material resulted in a scant growth of staphylococcal species only. Although not confirmed histologically, the gross post mortem picture and lack of bacterial isolates were highly suggestive of Sarcocystis infection, which is a relatively common presentation in alpacas of all ages, but in particular adults. Contact with wild or domestic Canidae (the definitive host) is often a feature of this condition.

Abortion caused by BVD in an Alpaca
A fetus, weighing 3.2kg that had been aborted by a ten-year old Alpaca, was submitted to Langford to investigate the cause of abortion. A positive BVDV RT-PCR result was obtained following testing of the spleen. Further immunohistochemical analysis enabled the detection of Pestivirus labelling within the meninges and meningeal lining cells supporting the diagnosis of BVDV infection in this fetus, and therefore of BVDV infection in the dam leading to loss of the fetus.

WILDLIFE

Woodmice
Histopathological examination of liver lesions from woodmice (Apodemus sylvaticus) submitted as part of a research project indicated that they were caused by parasite infestations. A trematode fluke infection was found in one case and in the second case, a larval tapeworm strobilicercus was considered the most likely cause.

TB in a Buzzard
Avian tuberculosis was suspected in a buzzard. A formalin-fixed sample was submitted from a 10cm diameter mass which was found between the shoulders of an adult buzzard which had died. Histological examination revealed a chronic multiple focal severe granulomatous dermatitis. No bacteria were visible on H and E or PAS stained sections, but a Ziehl-Neelsen stained section showed the presence of clusters of beaded acid fast organisms in the smaller granulomas, but not in the larger granulomas.
Histological findings and the beaded nature of the organisms were suggestive of *Mycobacterium avium* infection.