Surveillance Newsletter – Summer 2021

As the summer is now around the corner and we emerge from the national lockdown, the Veterinary Pathology Centre (VPC) has been striving to assist even more farmers, small-holders and veterinary practitioners with challenging cases and disease outbreaks. Since the start of 2020 we have examined over 55 submissions from across our catchment area.

We welcome Dr Nicola Parry as the new Head of Pathology to the Centre. Dr Parry joined us in mid-April and will lead our team of board-certified pathologists and veterinary investigation officers in offering expertise in farm animal pathology and disease surveillance. Dr Parry has returned to the UK from the USA, after heading the pathology department at Tufts University's School of Veterinary Medicine and serving as Chief of Pathology in the Division of Comparative Medicine at Massachusetts Institute of Technology, where she coordinated diagnostic and research pathology support and disease surveillance.

We are sad to announce that Dr Benedetta Amato (Veterinary Investigation Officer) will be leaving the department in early July 2021, but we would like to thank her for all of her assistance and wish her all the best for her future career plans. However, we are very excited that Dr Marvin Firth has now returned to the VPC from Cambridge University and has already enjoyed assisting in the Surveillance programme once again. Moving forward, Dr Firth will be VPC's liaison to the Farm animal Surveillance programme.

Finally, we are continually striving to improve the service our referring practices receive and so should you have any comments or suggestions, please do not hesitate to contact us at vetpath@surrey.ac.uk or complete our online satisfaction survey at https://surrey.onlinesurveys.ac.uk/customer-satisfaction-with-the-veterinary-pathology-centre-2

With best wishes for a successful Summer,

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Surveillance Programme Liaison

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Farm Pathology and Surveillance Officer

Dr Nicola M. Parry BSc (Hons), MSc, BVSc (Hons), DACVP, FRSPH, FRSB, FRCVS
RCVS Specialist in Pathology, Head of Pathology

Within this newsletter we bring you updates on:

- **APHA Cattle 'Redwater' project**
- **The Animal Health Surveillance Podcast**
- **The Animal Disease Testing service (ADTS)**
- **Sheep parasite research (free worm egg counts)** and
- **Interesting cases** that have been submitted to the centre over the last few months, including;
    - Collection of South American **camelid** cases
    - ***Mycoplasma spp.*** infections in pigs and goats
    - **Fatty liver haemorrhagic syndrome in a chicken** and
    - **Jejunal volvulus in a beef calf**

Cattle 'Red water project'

Tick distribution across the UK is increasing, bringing with it the threat of tick-borne diseases. In Great Britain, the most commonly reported tick-borne disease in cattle is bovine babesiosis, otherwise known as Redwater. The prevalence of this disease varies greatly across different regions of GB, although the reasons for this are unknown.

APHA scientists have recently developed a new pan-piroplasm/*Anaplasma phagocytophilum* PCR test to detect *Babesia divergens* (the causative organism of babesiosis) in blood samples. This currently unvalidated test is highly sensitive, and is able to additionally detect other tick-borne diseases which may be present. Tick-borne 'coinfections' can result in higher than normal morbidity levels and, given the different pathogenesis of each disease, can have a major impact on case management.

APHA has diagnosed a number of 'coinfection' outbreaks in cattle in the last few years. Typical clinical signs of Redwater include **fever, anaemia, diarrhoea, and red urine**. **Abortion can also occur.** The symptoms of other tickborne diseases in cattle can be less specific and may be underdiagnosed.

During this grazing season - until autumn 2021, APHA are offering **free PCR testing for babesiosis on EDTA blood samples. These can be submitted from up to three cattle displaying clinical signs of babesiosis per farm**. Both beef and dairy animals at grass can be sampled and results will be reported to you in the usual manner.

To take part in the study, APHA ask that you submit the collected EDTA blood samples to APHA Starcross, alongside a completed APHA cattle submission form, which can be found at http://apha.defra.gov.uk/vet-gateway/surveillance/forms.htm. The full animal ear tag number and the OS map reference/what3words address of the affected grazing field is also required.

The information gathered will contribute valuable surveillance data on babesiosis and other tick-borne pathogens in different regions of GB. All data will be anonymised for inclusion in this study. We may also contact participating vets/farmers to collect further epidemiological data. This will help us understand risk factors for Redwater in cattle, and why prevalence varies across different areas of Great Britain.

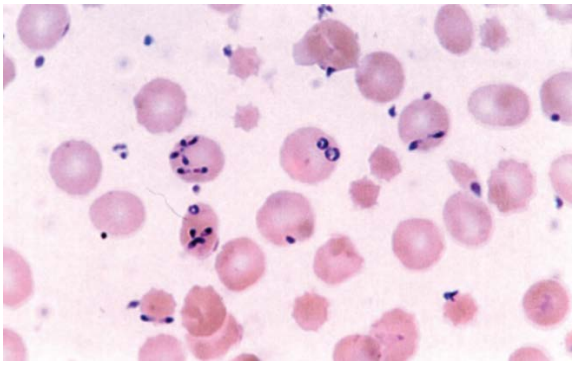

Figure 1: Blood smear showing the haemoparasites, *Babesia divergens*.
Taken from: http://www.veterinaryirelandjournal.com/focus/155-redwater-infection-clinical-signs-and-treatment.

You may remember from our previous newsletter, that you can also submit any ticks that you find to Public Health England (PHE) for species identification. Further details including how to submit can be found at https://www.gov.uk/guidance/tick-surveillance-scheme#how-to-send-your-ticks-to-phe

The Animal Health Surveillance Podcast

Whilst driving around in the summer sun(!) you can check out the latest episodes of **The Animal Health Surveillance Podcast**. Tune in to find out what surveillance can do for you? And we will be speaking to Professor Diana Williams from COWS about sustainable parasite control. Episodes 4 and 5 are now available:

- **Episode 4: What can Surveillance do for you?**

Featuring guest speaker, Fin Twomey, Head of Surveillance Intelligence Unit, APHA.

- **Episode 5: Professor Diana Williams from Control of Worms Sustainably (COWS)**

Have a listen to the podcast here: https://theanimalhealthsurveillancepodcast.buzzsprout.com/ Follow on Twitter @The AHSpodcast

ADTS

Remember if you would like to take advantage of the Animal Disease Testing Service (ADTS) and submit your own samples rather than request full *post-mortem* examination at VPC, then you can visit https://www.gov.uk/animal-disease-testing, where there is information about available tests, sampling requirements and prices of available sample testing.

SHEEP PARASITE RESEARCH

Would your sheep clients benefit from FREE FAECAL EGG COUNTS? If so, this project is for you!

Researchers at the University of Surrey are conducting a study to determine how refrigerating sheep faeces for varying durations affects parasite diagnostics. We need your help to obtain fresh (never chilled) sheep faeces and hope to begin receiving samples from mid-July until the end of October.

What we need from you:

- A minimum of 50 g (~50 pellets) of FRESH sheep faeces likely to contain nematode eggs

What we will give you:

-A postage prepaid parcel with everything you need to collect and mail us the samples

-Free faecal egg counts on all samples submitted within 48 hours of receipt at the lab

If you have clients who may wish to participate, please contact Dr Emma Borkowski (e.borkowski@surrey.ac.uk) for more information about participating and to arrange shipment of your sample kit(s). We hope to hear from you soon!

Interesting cases from the Veterinary Pathology Centre

Camelid round-up

At the VPC we are lucky to have facilities to accept South American camelids (SAC) through the surveillance service and privately, and have seen an increasing number of submissions of all ages and varieties. Some of the more recent cases have included the following:

A *22-month-old male alpaca* was presented after a 2-week history of lameness, wasting and blindness. Affecting the gingiva, soft palate and hard palate were multifocal, variably-sized (up to 10 x 5cm), full thickness, irregularly shaped, pale pink to white ulcers which also contained fibrous material and purulent discharge. A 10 x 4cm, irregularly shaped, full thickness ulcer of C3 was also present with a fibrin covering. Histopathology revealed a disseminated mycotic pneumonia and encephalitis with the portal of entry believed to be either the C3 ulceration or cheilitis. Fungal culture identified *Aspergillus spp*. and PCR is being undertaken at the Public Health England (PHE) mycology reference laboratory.

A *6-month-old male alpaca* was examined after being found recumbent, inappetent and dehydrated. On *post-mortem* examination there was moderate faecal staining and mild dehydration. There was approximately 700mL of clear yellow fluid in the abdominal cavity and a diffusely dark red to black liver. The small intestine was distended by gas and the wall was diffusely red to dark red with watery green to brown digesta. The large intestine contained watery green digesta. Histopathology and faecal microscopy confirmed the

presence of ***Eimeria macusaniensis*** which led to a severe segmental erosive enteritis and ultimately the demise in this alpaca. *E. macusaniensis* is extremely important in SACs as a cause of acute or sudden death and can cause disease on its own, or via erosion of the intestinal mucosa, allowing a portal of entry for intestinal opportunists and commensals.

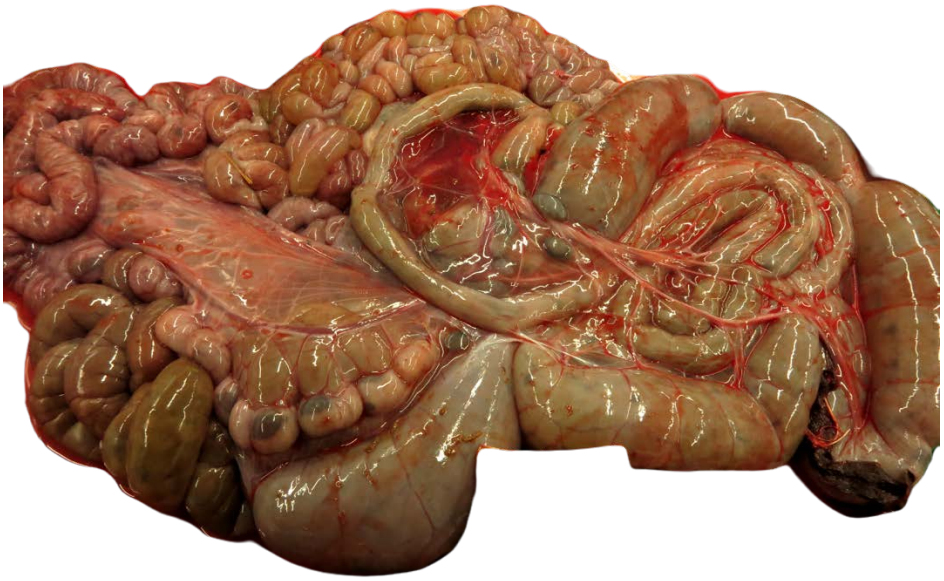

Figure 2: 6-month-old Alpaca: Segmentally extensive dark red discolouration of the small intestine with diffuse moderate to marked gaseous distension and marked mesenteric lymphadenomegaly.

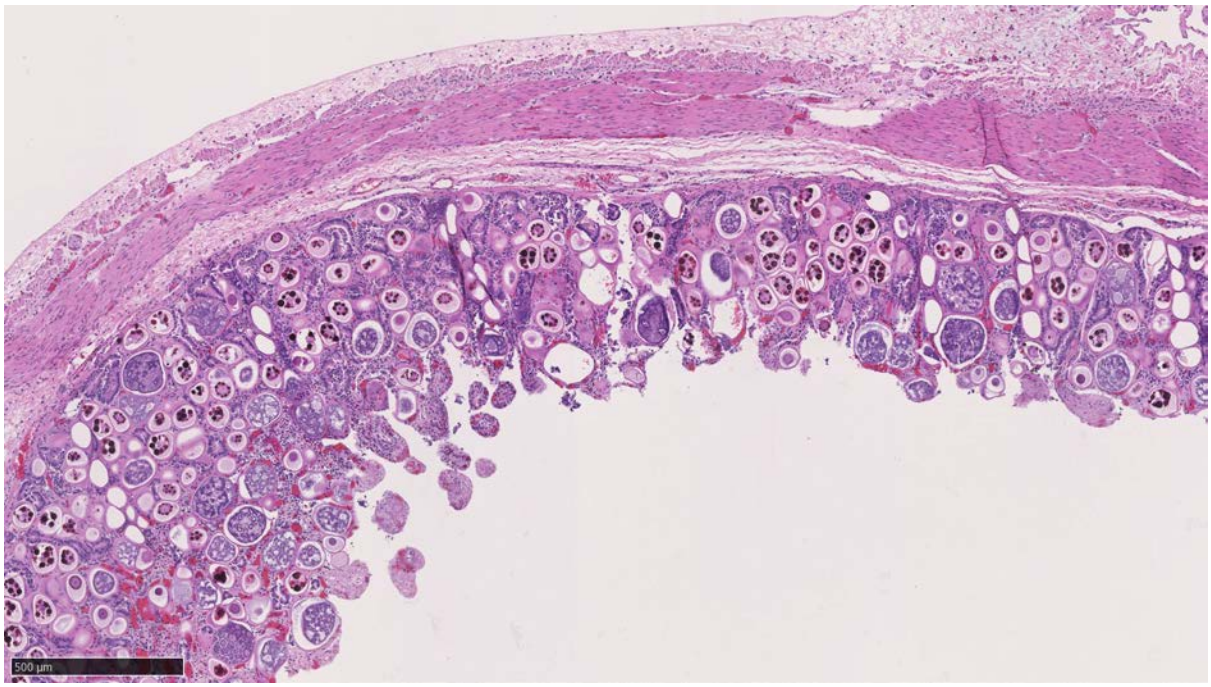

Figure 3. 6-month-old Alpaca: Small intestine (H&E Stain) showing extensive intramucosal *Eimeria macusaniensis.*

A *5-year-old female alpaca* was submitted after 3 days of tachycardia, tachypnoea and dyspnoea. The referring vet had noted that the herd had access to poor quality grazing and were being supplemented with hay and concentrates. On *post-mortem* examination there

was approximately 3L of serosanguinous fluid within the thoracic cavity. There was approximately 10mL of straw-coloured fluid within the pericardial sac and a further 1.5L of serosanguinous fluid within the abdominal cavity. C1 and C2 were markedly distended and contained dark blue sand-like material. The C2 mucosa was diffusely red to dark red and markedly thickened and covered by thick pale yellow to white creamy material. Histologically the C2 compartment showed a severe, chronic pyogranulomatous inflammation with intralesional coccoid, rod-shaped and filamentous bacteria and occasional clustered of fungal hyphae. It was proposed that a possible **sand impaction** and chronic inflammation of the C2 could have predisposed to a septicaemic process that contributed to the demise in this animal.

Make sure to follow future news and emails with regards to a Camelid CPD event to be hosted in the VPC later this year! To register your interest please email m.firth@surrey.ac.uk

Mycoplasma spp. infections

Mycoplasma spp. are an extensive group of bacteria, with more than 100 types identified in veterinary medicine. Mycoplasma are very simple one-celled organisms without outer membranes, and can lead to infections throughout the body in many farmed animal species. Here at the VPC, we have recently had a variety of cases that have had mycoplasma implicated in their pathogenesis, especially pneumonia. The first was *10-week-old female goat* that presented with sudden onset neurological signs that included opisthotonos, pyrexia, recumbency and vocalisation. A suspicion of meningitis or listeriosis was made by the referring veterinary surgeon. The gross findings of the *post-mortem* examination included focal dark red to black discolouration of approximately 2x1cm in the cranioventral lung lobe which histologically was confirmed as a severe diffuse interstitial pneumonia with pulmonary oedema and bronchus-associated lymphoid tissue hyperplasia. Whilst the brain appeared grossly normal, histology detected mild acute multifocal perivascular haemorrhage, although this was considered non-significant and was likely an agonal change. Ancillary testing and culture of lung tissue detected ***Mycoplasma spp.,* but of an unknown profile**. Further culture and speciation are currently being undertaken.

The second case was of *two 10-month-old wild boar* that were euthanased for poor doing and wasting over a 2-week period. In both boars, approximately 40-70% of the visceral and parietal pleura were covered by thin to thick, white strands, and the lungs were diffusely red with multifocal to coalescing dark red to black areas of discolouration. Tracheobronchial and mediastinal lymph nodes were diffusely moderately enlarged. Histology confirmed severe bronchointerstitial pleuropneumonia consistent with a diagnosis of mycoplasmosis. DGGE PCR on lung tissue confirmed the presence of ***M. hyorhinis*, *M. hyopneumoniae* and a further unidentified profile**. Mycoplasma-related pneumonias in swine are often chronic and severe, with a knock-on effect on both development and growth rates.

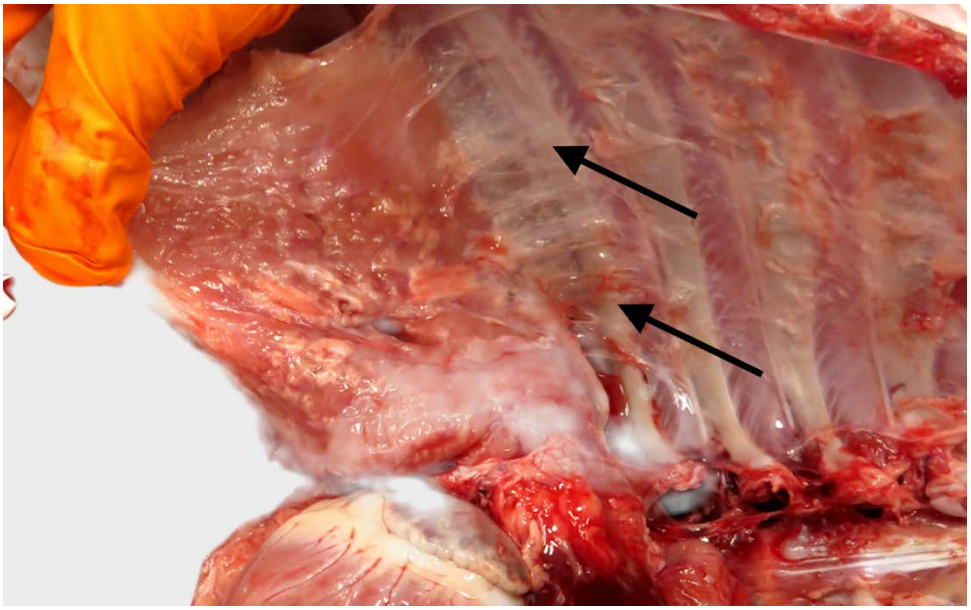

Figure 4: Firm, white, thick fibrous adhesions between the pleural surface of the lung and the pleural cavity in a 10-month-old wild boar.

Autogenous vaccines for *Mycoplasma spp.* Can often be created and our links with the mycoplasma team at APHA can assist us in using the cultured strains to make *Mycoplasma* specific strains for your farm. Contact us at VPC for more information on this.

Fatty liver haemorrhagic syndrome in a chicken

A 3-year-old adult chicken was presented after 3 out of 9 chickens had died without any antemortem symptoms. On *post-mortem* examination, the coelomic cavity contained an abundant amount of adipose tissue and 5mL of serosanguinous fluid. There was a single dark red to black 10x 3cm blood clot overlying the liver capsule. The liver was diffusely pale tan to yellow, with multifocal to coalescing dark red areas that are consistent with fatty liver haemorrhagic syndrome (FLHS).

Figure 5: Chicken: A diffusely pale tan liver with a focally extensive haemorrhage extending from the capsular surface consistent with fatty liver haemorrhagic syndrome.

Fatty liver haemorrhagic syndrome is associated with a surfeit of energy intake, regardless of the source, in birds whose exercise is limited. The condition is observed primarily in females. With the initiation of egg production, the oestrogen levels in the serum increase, as does the fat content in the liver. FLHS can be induced experimentally in layers, and even in male birds, by administration of oestrogen. This suggests that FLHS occurs more frequently in high-producing birds that presumably are producing more oestrogen from active ovaries. The degree of FLHS can be described as a poultry liver haemorrhage score (scale of 1–5):

- 1 = no haemorrhage
- 2 = 1–5 haemorrhages
- 3 = 6–15 haemorrhages
- 4 = 16–25 haemorrhages
- 5 = >25 haemorrhages, as well as a massive, usually fatal, haemorrhage

In this case, the focally extensive haemorrhage and evidence of haemabdomen would suggest a score of 5. Fatty liver disorder also impairs calcium metabolism in the bird, so you can see a knock-on effect to both skeletal integrity and eggshell quality.

Jejunal volvulus in a beef calf

A *6-week-old Jersey-cross male calf* presented after acute colic symptoms (stretching, kicking of abdomen) which persisted for 24 hours and then died. *Post-mortem* examination revealed approximately 2L of serosanguinous fluid within the abdominal cavity, a noticeable bloat line in the oesophagus and a segmentally extensive portion of the jejunum that was diffusely dark red to black and contained dark red to black watery fluid. Coiling of this section at the mesentery was also noticed as well as moderate enlargement of the mesenteric lymph nodes. A diagnosis of **jejunal intestinal volvulus** with secondary bloat was the most likely cause of death in this animal.

Mesenteric volvulus is common in suckling ruminants and the gross appearance of abdominal distension, and discoloured and tensely dilated loops of bowel are often apparent. Both ingestion of large amounts of feed over a short period of time and hypermotility of the gut (seen in diarrhoeic animals) have been proposed as possible precursors to volvulus.

Figure 6: 6-week-old calf: Segmentally extensive dark-red discolouration and distension of the jejunum (jejunal volvulus).

For further information on the services and facilities provided at the VPC please visit the website and to submit any cases please use the submission form found here.