Surveillance Newsletter – Autumn 2020

Overview

Whilst the Spring and Summer of 2020 has been filled with challenges arising from the COVID-19 pandemic, here at the Veterinary Pathology Centre (VPC) we have continued to offer surveillance and farm animal pathology services as it is a recognised government essential service. Our aim continued to be to provide a consistent, high-level of service to primary veterinary surgeons and farmers, to allow them to emerge from these difficult times in an informed and enabled position about their patients' and animal's health.

The Veterinary Pathology Centre itself became part of the Surrey Local Resilience Forum (LRF) that necessitated VPC staff decamping to alternative temporary premises in West Sussex in order to continue our day-to-day duties. In doing so, it allowed the Royal Surrey County Hospital vital additional space to accommodate local human patients who had unfortunately fallen victim to COVID-19 infection.

Throughout the UK, government guidelines have impacted on the provision of veterinary care and so it is of no surprise that we experienced an overall reduction in the number of submissions for *post-mortem* examination. Essential veterinary work resulted in skeleton staffing in many practices. The effect of this included that the national surveillance network as a whole experienced a decline in sampling and *post-mortem* examinations being performed. However, we were still able to assist our primary veterinary clinicians in complicated cases remotely and where possible through *post-mortem* and ancillary testing.

We have also worked to improve our communications and reporting style and welcome feedback from those who have experienced the service over the last 4-6 months. Please do not hesitate to email your thoughts and comments to vetpath@surrey.ac.uk or call us at 01483 689823

Table 1. Surveillance case submissions January to August 2019-2020. All species were examined throughout the lockdown period, but overall numbers of submissions were reduced.

UoS	Species	Jan-Aug 2019	Jan-Aug 2020
	Cattle	51	30
	Sheep	33	25
	Bird	6	6
	Pig	6	6
	Misc	11	7
Total:		**107**	**74**

The figures show that all locally farmed species were represented throughout the period of UK lockdown. Whilst there were initial issues around the postal delivery of samples we sent out for additional testing; we are pleased to have be able to process 100% of our submissions. The VPC is now seeing an increase in submissions with the return of veterinary surgeons to farms and smallholdings. A full surveillance and private diagnostic service is once again being provided by VPC at the University of Surrey. Recommended government safety guidelines are being employed during our day-to-day working e.g. working from home where possible, social distancing and the use of face-masks and sanitising stations.

We are pleased to present a selection of the interesting cases that we have examined over the last few months. We are also providing **updated information** on

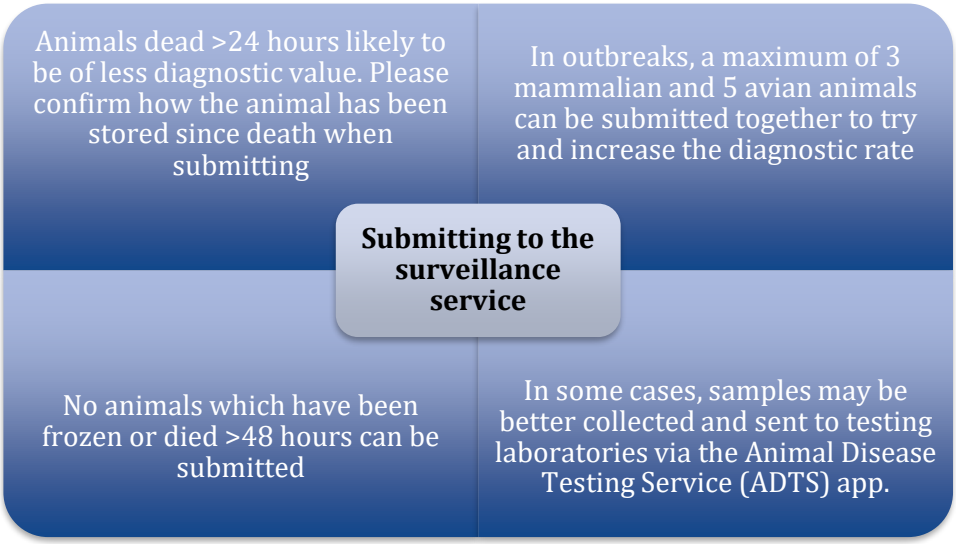
- pricing,
- how to submit animals to the VPC
- the national Tick Surveillance Scheme (TSS).

We look forward to hearing from you and assisting you with your cases as the year progresses.

Dr Marvin J. Firth BVSc (Hons.), DipFMS, MRCVS
Farm Pathology and Surveillance Officer

Dr Joan Smyth MVB (Hons.), PhD, DipECVP, MRCVS
Head of Veterinary Pathology

How to submit animals for *post-mortem* examination



If you are unsure about whether your case is suitable for submission please contact us at vetpath@surrey.ac.uk or 01483 689823 to speak with a Veterinary Investigation Officer.

Arthritis due to *Mycoplasma hyosynoviae* in young replacement breeding pigs

Two non-pregnant 6-month-old gilts weighing around 100 kg each were euthanased on-farm after being found recumbent, and were submitted for investigation to the Veterinary Pathology Centre (VPC). The farm reported on-going problems of lameness in pigs of this age. Pigs were kept in outdoor paddocks in groups of 20. The affected group of pigs were part way through a vaccination programme that included vaccination for erysipelas. The submitted gilts had not received any treatment.

Post-mortem examination revealed synovial hyperplasia with mild to moderate pannus formation in the stifle joints (Figure 2) of one gilt, and increased amounts of thin, yellow to pale brown synovial fluid with flocculant material in both carpal joints. There was no evidence of bone fractures or other potential causes of recumbency in either pig. This raised the possibility of arthritis due to *Mycoplasma* or *Erysipelothrix* infection. Culture for both organisms, as well as Mycoplasma DGGE-PCR were initiated. *Mycoplasma hyosynoviae* was detected by DGGE-PCR and was also successfully isolated in culture (Figure 1).

Following discussions with the veterinarian attending the unit, Dr Marvin Firth (acting Farm Animal Pathologist and Surveillance Officer) arranged with APHA's *Mycoplasma* Team to supply the *M. hyosynoviae* culture to an external laboratory for autogenous vaccine production. There is currently no commercial vaccine available for *M. hyosynoviae*. This Mycoplasma species usually causes arthritis

with synovitis in older pigs (usually over 10 weeks old) compared to *M. hyorhinis* that mainly causes polyserositis and polyarthritis in younger pigs around seven weeks old. This case has been described in the January to March 2020 GB pig quarterly report (1).

M. hyosynoviae arthritis with synovitis typically causes reddening and hyperplasia of synovial membranes in affected joints with excess synovial fluid as illustrated in Figure 2. *Mycoplasma* DGGE-PCR on synovium or synovial fluid is the best diagnostic test for *M. hyosynoviae*, and histopathology on synovium can provide confirmation of synovitis if the gross appearance is not definitive.

Additional advice on samples and tests for diagnosis of musculoskeletal disease in pigs is available in the APHA diagnostic guide found at this link: http://apha.defra.gov.uk/documents/surveillance/sub-handbook.pdf

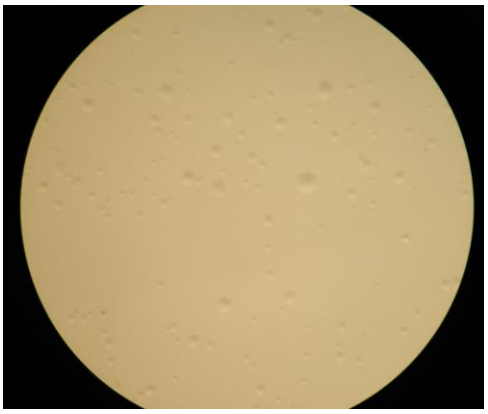


Figure 1: *Mycoplasma hyosynoviae* colonies after 5 days of incubation in APHA in-house *M. hyosynoviae* liquid media, in 5% CO_2 atmosphere.

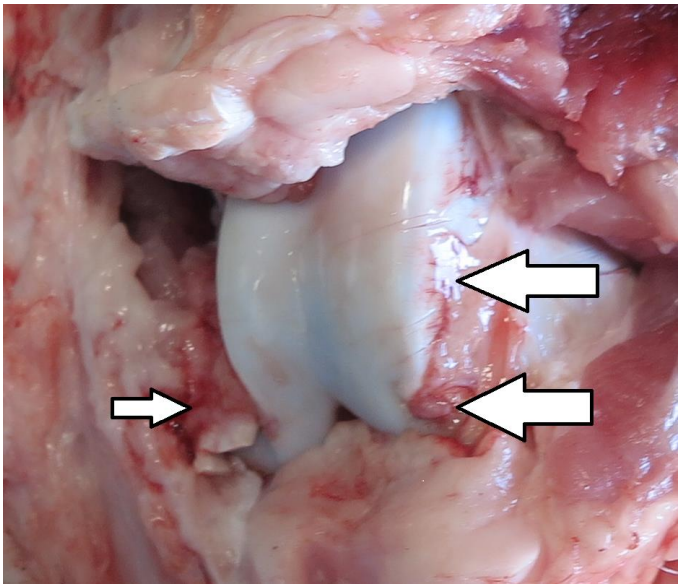


Figure 2: Synovitis (small arrow) with pannus formation (large arrows) and arthritis of the stifle due to *Mycoplasma hyosynoviae.*

1. APHA (2020) *Mycoplasma hyorhinis* incidents with PRRS. In GB pig quarterly report: Disease surveillance and emerging threats Volume 24: Q1 – January to March 2020 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889984/pub-survrep-p0120.pdf

Ammonia toxicity in a group of beef cattle

Eleven out of a group of 12, 6 month-old castrated Hereford-cross beef cattle were found dead. Two of the dead animals were submitted to the VPC for *post-mortem* examination after an anthrax test performed by the attending veterinary surgeon proved negative. They had been vaccinated with a multivalent *Clostridium spp.* vaccine earlier that day and then turned out onto new grazing. There were no sign of poisonous plants in the field, nor history of poultry manure spread on the pasture, nor history of electrical storms. A make-shift trough water source had been used to provide water to this group of animals after vaccination and a water sample was taken from it. Due to the recent vaccination it was also recommended that a potential adverse drug reaction be reported to the Veterinary Medicines Directorate (VMD).

On post-mortem examination the cows were markedly bloated with submucosal and intramuscular haemorrhage and necrotizing vasculitis in the trachea.

Clostridium perfringens toxin ELISA for alpha, beta and epsilon toxins was negative. Analysis of the drinking water revealed total nitrogen of >160mg/litre and ammonium nitrogen was 12.6mg/litre (normal ammonium nitrogen: <0.05mg/litre). This ammonium nitrogen level far exceeded the recommended UK drinking water level and that of mains water. It was then discovered that the water trough had previously been used to store nitrogen-containing fertiliser which would support a diagnosis of death due to ammonia toxicity.

The typical presentation for ammonia toxicosis in ruminants is sudden death as the progression of clinical signs is very rapid (15 minutes to several hours). Nitrate from the fertiliser is broken down to nitrite in the rumen and is usually converted to ammonia in the rumen. Ammonia is usually absorbed from the rumen and is normally detoxified by the liver via the urea cycle. This detoxification system can be overwhelmed by too much non-protein nitrogen in the circulation, resulting in elevated blood ammonia levels. This can lead to clinical signs such as dilated pupils, ear twitching and rapid eye blinking to tetanic convulsions and then death.

Unusual brain lesions in an 18-month old steer with suspected actinobacillosis of the tongue

An 18-month old Aberdeen Angus-cross steer was euthanased after a 3-month history of progressive salivation, drooling, weight loss and a lack of response to penicillin and streptomycin antimicrobial therapy. This animal was then presented for post-mortem examination to confirm actinobacillosis of the tongue ('Wooden Tongue'). Abnormal accumulation of saliva in the mouth is known as ptyalism. This can be due to hypersialosis (hypersecretion of saliva) or pseudoptyalism (drooling of saliva due to inability to swallow a normal volume of saliva).
The following are possible causes of ptyalism in ruminants:

Common causes of ptyalism	• Oral foreign bodies • Actinobacillosis • Stomatitis or vesicular disease e.g. FMD, Bovine Papular Stomatitis • Oral pain e.g. fracture of the jaw; dental disease • Salivary calculi (Sialoliths) • Encephalitis • Organophosphate or heavy metal poisoning • Mycotoxins • Neurotoxication
Aptyalism (absence or deficiency in secretion of saliva)– Less common	• Fever • Dehydration • Salivary gland disease (e.g. adenitis)

No macroscopic changes were observed in the tongue or oral cavity. Histology of the tongue was normal but there was moderate, multifocal, axonal and myelin degeneration and gliosis in the brainstem. There was also congestion, perivascular oedema and haemorrhage in the grey matter and mild gliosis of the hippocampus. These histological changes are non- specific. Congenital disease is also possible, with a hereditary form of axonal dystrophy (Bovine Progressive Degenerative Myelopathy); a familial disease reported in Brown Swiss cattle. This case has been discussed with the Cattle Expert Group within APHA and further neuropathological assessment is being performed on this unusual case.

Oak toxicosis in a 9-year old suckler cow

A 9-year old mixed breed suckler cow was presented to the VPC for *post-mortem* examination, having died after a 48-hour history of lethargy, recumbency, ataxia and pyrexia. Three additional animals out of the group of 70 later presented with the same clinical signs and soon died. Biochemistry performed by the attending

veterinary surgeon showed elevated renal parameters including *ante-mortem* blood urea nitrogen of 249umol/L (normal: 40-170umol/L).

On *post-mortem* examination there were extensive ecchymoses throughout the abdominal and thoracic organs (Figure 3.), connective tissue and muscle of the limbs and body wall as well as the meninges. There were both immature and mature oak leaf fragments within the rumen content (Figure 4.). Histological evaluation of the liver, kidney and heart also revealed multifocal and locally extensive haemorrhages consistent with the primary differential of oak poisoning.

Oak poisoning in cattle can occur after ingestion of leaves, buds, twigs and acorns of many of the *Quercus spp*. It is not known in this case how the cattle came to access the oak material. Tannins and their metabolites, gallic acid and pyrogallol, are now widely believed to be the major toxic factors within oak. Immature leaves (green) are believed to have higher levels of these toxins. The exact mechanism of action is not known but tannins are thought to be both hepato- and nephrotoxic. The major clinical signs are predominately seen in 1-12 days after ingestion, but some cattle have a protracted, debilitating disease. In the per-acute stages cattle are often found recumbent, weak and anorectic. A decrease in ruminal motility has also been observed on clinical examination. Faeces have been reported to have a smell of phenol, especially in calves. The alimentary and urinary systems are the most affected. Abortions have also been observed following oak consumption in cattle. Other common diseases that resemble oak poisoning clinically include pigweed (*Amaranthus spp.*), aminoglycoside antibiotic poisoning, oxalate poisoning and ochractoxicosis.

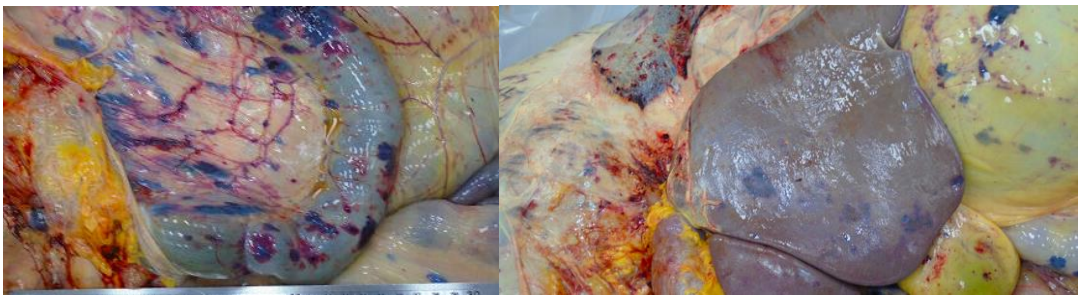


Figure 3: Multifocal to coalescing serosal ecchymotic haemorrhages throughout the abdominal viscera.

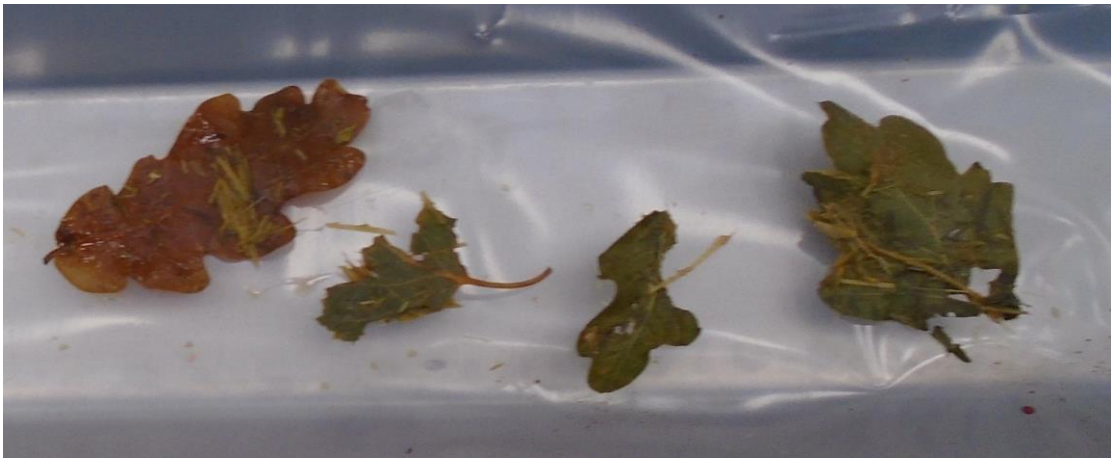


Figure 4: Immature (green) and mature (brown) oak leaves found throughout the rumen content.

Haemothorax in a 3.5 week old cria

A 3.5 week old cria, weighing 17.7kg, died overnight and was presented to the VPC with a query from the attending veterinary surgeon over clostridial disease, *E. coli* septicaemia or intestinal intussusception. The cria had been vaccinated with a multivalent *Clostridium spp.* vaccine and had been thriving.

On *post-mortem* examination there was mucosal pallor in the oral cavity and in the thoracic cavity, predominantly on the right side, was approximately 800ml of partly clotted blood. There were complete, transverse non-displaced fractures of the proximal third of right ribs5-7. Spanning 90% of the intercostal muscle between ribs 5 and 6 was a vertical longitudinal tear and intercostal muscle haemorrhage (Figure 5). This injury was consistent with blunt force trauma. Domestic animals have blood volumes of 7-9% of their body weight, making this animal's blood volume 1.2-2.0L. The amount of blood lost into the thoracic cavity was therefore enough to cause haemorrhagic shock and death.

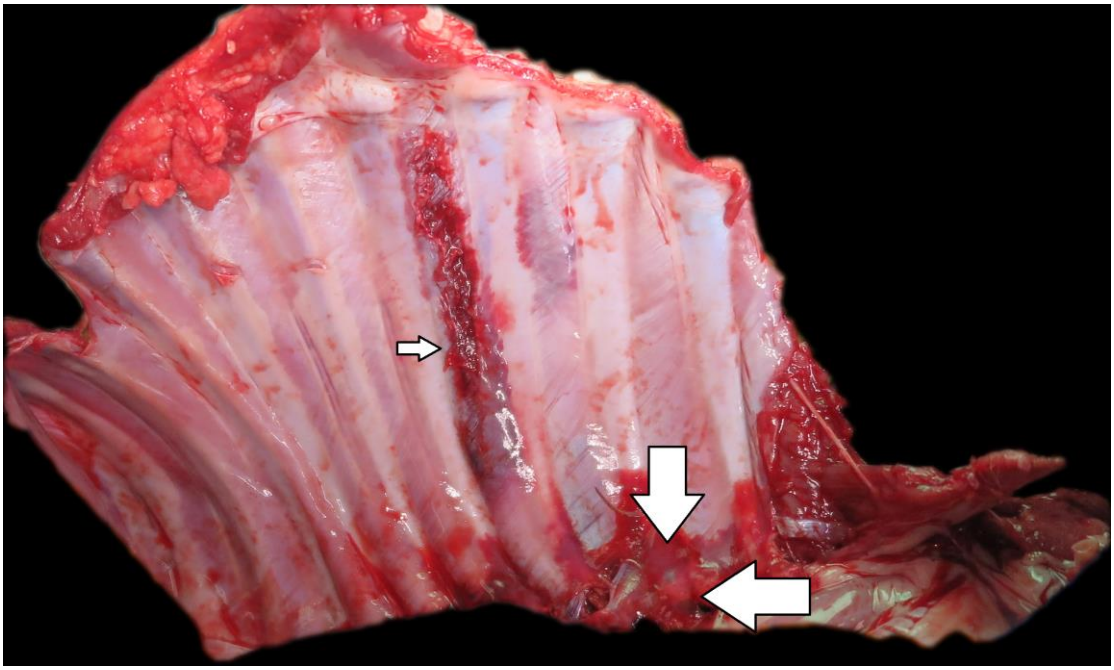


Figure 5: Complete, transverse fractures of the proximal third of right ribs 5-7 (large arrow) and longitudinal tear and haemorrhage of the intercostal muscle (small arrow).

Tick Surveillance Scheme (TSS) – Public Health England

Reports from across the UK surveillance veterinary network show an increasing number of ticks found on examined animals, and in the number of tick-borne disease diagnoses such as Tick Borne Fever, Babesiosis and *Anaplasma spp.* infection. Public Health England (PHE) is encouraging everyone to be 'tick aware', from members of the general public, to doctors and veterinary surgeons, wildlife groups and others. The TSS was set up by PHE in 2005 and is the only scheme which records tick distributions on a national scale.

Figure 6: - Unengorged and engorged adult *Ixodes ricinus*
Image source: maturetimes.co.uk.

To take part in the scheme you can submit your removed ticks to the scheme and PHE will inform you of its identity (but not the pathogens they may carry)! Details of the recording form and guidance document on how to submit ticks can be found at https://www.gov.uk/guidance/tick-surveillance-scheme
It is hoped that participation in the scheme will improve our knowledge of tick distribution and seasonality on a nationwide scale, determine the diversity of ticks infecting humans and animals in the UK and also detect non-native (imported) or rare UK tick species.

'*We regularly use the University of Surrey Veterinary Pathology Service, particularly via the APHA subsidised carcase collection service, for our pig farming clients across the South of England. Achieving an accurate diagnosis is absolutely fundamental to our work and having this expert diagnostic back-up is essential. Both lay and professional staff at the service are helpful, reliable and committed to chasing down a diagnosis which can often be quite challenging. We have had some great results from recent cases and this has really allowed to us to advance the health and welfare of the pigs we look after*.'

Richard Pearson, Director – The George Veterinary Group

Surveillance Pricing Schedule 2020

PRICING SCHEDULE

The following prices are subsidised provided the history satisfies the surveillance triage criteria. For non-subsidised prices, please click here. Price includes: PME and basic testing to reach diagnosis and is charged to the submitting veterinary surgeon. Note: if additional testing is requested or required, the submitting veterinary surgeon will be informed of the cost before proceeding.

Code	Description	Disposal fee	Fee payable by PVS (not including disposal charges)
TC0001	PME: Farmed poultry and game birds older than 2 weeks and farmed rabbits	£2.25	£39.90
TC0001 (Batch)	Up to 5		£83.30
TC0002	PME: Sheep, goats, deer and pigs	8 days - 6 weeks £11.30 >6 weeks £22.65	£68.90
TC0002 (Batch)	Up to 3		£97.10
TC0003	PME: Cattle over 6 months	6-12 months £50.85 >12 months £190.00	£150.30
TC0011	Sheep/goat and pig abortion - fetus(es) +/- placenta - from 1 dam	£5.65	£49.70
TC0012 (Batch)	Sheep/goat and pig abortion - fetus(es) +/- placenta - from 2 dams	£11.10	£61.50
TC0015	Cattle & other farmed species abortion, fetus(es) +/- placenta - from 1 dam	£7.90	£73.10
TC0017	PME: Neonatal (less than 1 week) sheep, pigs, goats	£8.00	£43.50
TC0017 (Batch)	Up to 3		£65.30
TC0020	PME: Camelids	£29.00	£128.10
TC0021	PME: Farmed poultry and game birds up to 2 weeks old	£1.00	£39.00
TC0021 (Batch)	Up to 10		£80.90
TC0022	PME: Calves (up to 6 months), camelids (up to 12 months)	£28.30	£104.80
TC0022 (Batch)	Up to 3		£142.80

Submitting veterinary surgeons must call to discuss and agree a Surveillance PME with the Veterinary Pathology Centre (01483) 689823.
A disposal fee will be charged for any carcasses received without prior agreement.

Prices dated 1st September to 31st December 2020

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.