



# DEFRA / AHT / BEVA EQUINE QUARTERLY DISEASE SURVEILLANCE REPORT Volume 2, No. 2: April-June 2006



## Highlights in this issue:

- **Equine Infectious Anaemia including Irish Update**
- **Donkey Sanctuary PME Summary Article**

### **Important note:**

The data presented in this report must be interpreted with caution, as there is likely to be some bias in the way that samples are submitted for laboratory testing. For example they are influenced by factors such as owner attitude or financial constraints or are being conducted for routine screening as well as clinical investigation purposes. Consequently these data do not necessarily reflect true disease frequency within the equine population of Great Britain.



## TABLE OF CONTENTS

<b>INTRODUCTION</b>	<b>3</b>
<b><u>VIROLOGY DISEASE REPORT FOR THE SECOND QUARTER OF 2006</u></b>	<b>4</b>
<b>EQUINE HERPES VIRUS (EHV)</b>	<b>4</b>
<b>EQUINE INFLUENZA</b>	<b>5</b>
<b>FOCUS ARTICLE: EQUINE INFECTIOUS ANAEMIA (EIA)</b>	<b>5</b>
<b>UPDATE ON EQUINE INFECTIOUS ANAEMIA IN IRELAND</b>	<b>7</b>
<b><u>BACTERIOLOGY DISEASE REPORT FOR THE SECOND QUARTER 2006</u></b>	<b>7</b>
<b>UPDATE ON CONTAGIOUS EQUINE METRITIS ORGANISM (CEMO) IN UK</b>	<b>8</b>
<b><u>TOXIC AND PARASITIC DISEASE REPORT FOR THE SECOND QUARTER OF 2006</u></b>	<b>9</b>
<b><u>REPORT ON <i>POST MORTEM</i> EXAMINATIONS FOR SECOND QUARTER OF 2006</u></b>	<b>9</b>
<b>EAST ANGLIA</b>	<b>9</b>
<b>HOME COUNTIES</b>	<b>10</b>
<b>SOUTH WEST</b>	<b>10</b>
<b>FOCUS ARTICLE: INTRODUCTION AND SUMMARY OF POST MORTEM INFORMATION FROM THE DONKEY SANCTUARY</b>	<b>10</b>
<b><u>ACKNOWLEDGEMENTS</u></b>	<b>13</b>



## **Introduction**

Welcome to the second quarterly equine disease surveillance report for 2006 produced by DEFRA, BEVA and the Animal Health Trust. Regular readers will be aware that this report collates equine disease data arising from multiple diagnostic laboratories and veterinary practices throughout the United Kingdom giving a unique insight into equine disease occurrence on a national scale.

The second quarter of 2006 saw Barry Gardiner MP appointed as the new Minister for Biodiversity, Landscape and Rural Affairs, including 'Minister for the Horse Industry', following the cabinet reshuffle on the 5<sup>th</sup> May. For those of you wishing to remain in touch with developments such as this, more information can be found on the 'Gateway to equine issues in Government' page of DEFRA's website ([Click here](#)).

In a worrying development during the quarter, diagnoses of fatal equine infectious anaemia (EIA or swamp fever) were made in both Italy and the Republic of Ireland. The outbreaks were believed to be epidemiologically linked through the use of infected hyperimmune plasma in foals. In this report **Florence Manning** of the Animal Health Trust's Epidemiology Unit provides an overview of the disease and provides a summary of the situation as it occurred in Ireland during June. Further information relating to these outbreaks including details on a case that was recently confirmed in Northern Ireland, can be found on DEFRA's website ([Click here](#)).

Details of another notifiable equine infectious disease are also provided in this report for a diagnosis of contagious equine metritis (CEM) made during April in an imported mare in Oxfordshire. This again highlights the ever-present need for vigilance in biosecurity as laid out in the Horserace Betting Levy Board's Codes of Practice for venereal diseases. Details on this outbreak can also be found on DEFRA's website.

We are pleased to include in this report an introduction to and summary of post-mortem examinations made at the Donkey Sanctuary, Sidmouth, Devon. The report is kindly supplied by **Alex Thiemann**, one of the Sanctuary's team of veterinary surgeons, who care for the largest population of donkey's in Great Britain and we look forward to further donkey-specific surveillance data being provided for future reports.

Access to all of the equine disease surveillance reports can be made on a dedicated page on the Animal Health Trust website ([Click here](#)) or via the BEVA ([Click here](#)) and Defra websites ([Click here](#)). We would also remind readers and their colleagues that there is available on the AHT website a form for registration to receive reports regularly via e-mail as they are produced ([Click here](#))



### Virology Disease Report for the second quarter of 2006

The results of virological testing for April to June 2006, are summarized in Table 1, and include data relating to equine viral arteritis virus from the Veterinary Laboratories Agency (VLA), Weybridge. The sample population for the VLA is different from that for the other contributing laboratories, as the VLA's tests are principally in relation to international trade. Of the 21 serology positives detected by the VLA, 10 were among export samples, 1 from imports, 1 was related to artificial insemination, 7 were private requests and 2 were for diagnostic purposes (with the findings from import samples of relevance to the UK). The vast majority of sero-positives are as a result of previous vaccination. There has been no isolation in the UK of the EVA virus to date in 2006

**Table 1: Diagnostic virology sample throughput and positive results for second quarter 2006**

	Number of Samples Tested	Number Positive (%)	Number of Contributing Laboratories
<b><u>Serological Tests</u></b>			
EVA VN/ELISA	3605	38 (1.1%)	2
VLA EVA VN	822	21 (2.6%)	1
EHV-1/-4 CF test	770	69 (9.0%)	1
EHV-3 VN test	7	2 (28.6%)	1
ERV-1/-2 CF test	283	2 (0.7%)	1
Influenza HI test	281	2 (0.7%)	1
EIA (Coggins)	10	0 (0%)	1
<b><u>Virus Detection</u></b>			
EHV-1/-4 PCR	55	9 (16.4%)	1
EHV-2/-5 PCR	11	4 (36.4%)	1
Influenza NP ELISA	12	1 (8.3%)	1
Influenza VI in eggs	1	1 (100%)	1
EHV VI	397	18 (4.5%)	1
EVA VI/ PCR	2	0 (0%)	1
VLA EVA VI/ PCR	0	0 (0%)	1
Rotavirus	196	84 (42.9%)	6

VN = virus neutralisation, ELISA = enzyme-linked immunosorbent assay, CF = complement fixation, HI = haemagglutination inhibition, PCR = polymerase chain reaction, NP ELISA = nasopharyngeal swab  
VI = virus isolation, ERV = equine rhinovirus, # = Serpositives include vaccinated stallions

\* = Diagnosed positive on basis of seroconversion between paired sera

#### **EHV-1 Abortion/ Neonatal Foal Disease**

Five cases of EHV-1 abortion have been confirmed this quarter on premises in Yorkshire, the South West, Perthshire, Ayrshire and Suffolk of which four cases affected Thoroughbreds. Diagnosis was based on pathognomonic viral lesions in fetal tissues and positive EHV-1 PCR results. Vaccination status of the affected mares is not known.

A single case of EHV-1 pneumonia was confirmed as the cause of sudden death in a 10 hour-old Warmblood foal on a stud in Leicestershire. Diagnosis was based on characteristic viral lesions with intranuclear viral inclusion bodies detected in the liver and lungs.



### **EHV-4 Abortion/ Neonatal Foal Disease**

A single case of stillbirth in Leicestershire was attributed to fetal infection with EHV-4 in an unvaccinated non-Thoroughbred mare on the basis of positive EHV-4 PCR on examination of mixed fetal tissues. A seven day-old non-Thoroughbred foal in Gloucestershire that died after an acute illness was subsequently diagnosed with EHV-4 pneumonia and associated lung consolidation along with a congenital interventricular septal defect.

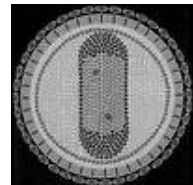
### **EHV-3 (Coital Exanthema)**

Three cases of coital exanthema have been confirmed this quarter affecting one Falabella pony and two non-Thoroughbreds. Diagnosis was on the basis of high serum VN antibody titres to EHV-3. Appropriate hygiene measures and breeding restrictions have been advised and follow up samples are awaited.

### **Equine Influenza**

An outbreak of equine influenza was confirmed on a livery yard in Hampshire based on positive ELISA on nasopharyngeal swabs. On the yard of 40 horses, only four animals were clinically affected with characteristic signs including a harsh dry cough and pyrexia. Vaccination history was not known for all horses on the yard but it was apparent that some animals were vaccinated and this is likely to have helped limit the extent of the outbreak. The virus was isolated and underwent strain typing at the Animal Health Trust. This identified a variant American lineage virus very similar to Wales/05 and other strains known to be circulating in the UK since the major outbreak in 2003.

### **FOCUS ARTICLE: EQUINE INFECTIOUS ANAEMIA (EIA) Florence Manning MRCVS, Epidemiology Unit, Animal Health Trust**



Also known as 'Swamp Fever', EIA is a viral disease of horses, mules and donkeys caused by infection with equine infectious anaemia virus (a lentivirus; EIAV). The virus is recognised worldwide and outbreaks have occurred in North and South America, Africa, Asia, Australia and Europe. EIA is a notifiable disease in the UK. EIAV does not cause disease in man.

#### **Clinical signs**

Clinical signs are highly variable and three different presentations are recognized; acute, chronic and subclinical disease. The incubation period (time from infection to development of clinical signs) ranges from as little as 3 days to as long as 3 months but generally takes 1 to 3 weeks.

Acute disease: characterised by high fever (40-42 degrees Celsius) lasting a couple of days and which may or may not be accompanied by depression, inappetance, petechiation of conjunctiva and mucous membranes, haemorrhagic diarrhoea, skin swelling, anaemia and pallor, jaundice, tachycardia and sometimes death. Such animals are highly viraemic and pose an infectious risk to in-contact horses. Surviving animals may go on to develop the chronic form of disease.

Chronic disease: associated with recurrent bouts of pyrexia and accompanying increased viraemia. There may be chronic depression, weight loss, anaemia and weakness. These bouts become less frequent and less infectious over time until the animal becomes an asymptomatic carrier.



Subacute disease: infected animals may exhibit no detectable clinical signs at all.

### **Transmission**

EIAV is transmitted from an infected to a susceptible animal via blood or blood products containing infectious virus. This can be transplacentally from dam to foal, via infected



blood products such as hyperimmune serum or unauthorised veterinary medicines or via insect vectors. The insect vectors recognised as potential virus transmitters are biting flies which take on a suitably large blood meal for instance Tabanids and Stomoxys (horse and stable flies). Mosquitoes are also potential vectors.

Infected horses remain infected for life and are a potential source of infection to

susceptible in-contacts particularly during pyrexia with correspondingly increased levels of viraemia.

### **Diagnosis**

It generally takes from 7 to 14 days after infection for an animal to develop detectable antibody levels. However there is some evidence to suggest that seroconversion can take much longer and hence repeat testing every 30 days for 3 months post possible exposure is currently recommended in an outbreak. Antibody then persists lifelong.

**Agar Gel Immunodiffusion Test (AGID) / Coggin's Test** – this is the test of choice for identification of EIAV antibody.

**Enzyme Linked Immunosorbent Assay (ELISA)** – this is a rapid test for EIAV antibody but currently all ELISA positives must be confirmed by Coggin's due to a relatively high occurrence of false positive tests.

### **Treatment**

Symptomatic and supportive treatment only. There is no specific treatment for EIA. In order to prevent further spread of the disease once a positive diagnosis is reached statutory destruction of the infected animal is required. The Divisional Veterinary Manager of the State Veterinary Service will put in place restrictions, testing requirements and vector control measures on the affected premises.

### **Vaccination**

There is no licensed vaccination against EIA currently available.

### **Control**

Control is based on the identification and destruction of infected animals and imposition of movement restrictions and testing of in-contacts on infected premises. Strict quarantine and separation of at least 180 metres from other animals has been found to be effective in controlling spread of infection.



**UPDATE ON EQUINE INFECTIOUS ANAEMIA IN IRELAND**  
**Florence Manning MRCVS, Epidemiology Unit, Animal Health Trust**

The authorities in Ireland announced on 15 June 2006 that they had found Equine Infectious Anaemia in horses on two stud farms. This apparently followed the administration of an infected equine biological product for treatment of an unrelated condition. Some horses from those stud farms, which may have been exposed to the disease, had been sent to the UK. The State Veterinary Service acted quickly to ensure these horses were isolated and tested for the disease. Fourteen horses were placed under restrictions in England, Wales and Scotland. All of these have now tested negative on at least one occasion and the majority on two occasions.

Further cases of Equine Infectious Anaemia have since been confirmed in Ireland and test results are awaited for a small number of other suspected cases. The majority of animals involved were previously identified and restricted as high risk due to very close contact with earlier confirmed cases. The authorities in Ireland informed Defra on 25 July and 1 August of further GB tracings subsequent to these new confirmations. These tracings were located and restrictions are in place with initial sampling being undertaken. A number of horses are under restrictions in England, Wales and Scotland and this will continue until DEFRA is satisfied that they present no risk to the UK equine industry

Given the dynamic nature of infectious disease and its control, readers are referred to DEFRA's website for the most up to date information:

<http://www.defra.gov.uk/animalh/diseases/notifiable/disease/infectiousanaemia.htm>

A Code of Practice for Equine Infectious Anaemia is now available online via the DEFRA website ([Click here](#))

**Bacteriology Disease Report for the second quarter 2006**

A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Table 2. For contagious equine metritis organism (CEMO) 11 of 28 HBLB approved laboratories contributed data.

VLA CEMO Data for the period April, May, June 2006.

We are again pleased to include data relating to CEM testing from the Veterinary Laboratories Agency (VLA), in this quarterly report. The sample population for the VLA is different from that for the other contributing laboratories as the VLA tests are principally in relation to international trade.

Submissions for International Trade pre-export tests continue the upward trend with submissions up 28.7% and swabs up 7.4% when compared with the same quarter 2005. The small increase in swabs relative to the much larger increase in submissions can be explained in that most were from mares requiring fewer swabs than the equivalent number of stallions.

One positive CEMO case was confirmed through a culture submitted from a private laboratory; the horse had previously been imported from Germany (see details of



investigation below). Phenotypic identification of the culture at Bury St Edmunds was confirmed by PCR at VLA Penrith.

#### MRSA

Methicillin resistant *Staphylococcus aureus* was isolated on one occasion during the quarter from a sample taken from an infected wound.

**Table 2: Diagnostic bacteriology sample throughput and positive results for second quarter 2006**

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<b>CEMO (HBLB)</b>	5179	1**	11
<b>CEMO (VLA)</b>	542	1**	1
<b>Strangles*</b>	731	79	14
<b>Salmonellosis</b>	237	6	5
Salmonella factor 4/ group B	17	1	1
<b>MRSA</b>	13	1	4
<b>Clostridium perfringens</b>	13	2	1
<b>Clostridium difficile</b>	36	1	3
<b>Cryptosporidium</b>	4	0	1
<b>Campylobacter jejuni</b>	8	1	1

CEMO = contagious equine metritis organism (*Taylorella equigenitalis*); HBLB = HBLB accredited laboratories; VLA = VLA reference laboratory; \*Streptococcus equi; MRSA = methicillin resistant *Staphylococcus aureus*; \*\*CEMO cultured on clitoral swab from a non-Thoroughbred mare and verified by VLA

#### **UPDATE ON CONTAGIOUS EQUINE METRITIS ORGANISM (CEMO) IN UK Florence Manning MRCVS, Epidemiology Unit, Animal Health Trust**

The Department for Environment Food and Rural Affairs confirmed a single case of CEMO in Oxfordshire on 24th April. The mare in question, privately owned and stabled in Oxfordshire, had been previously imported from Germany. Investigations were undertaken to confirm that the mare had not been used for breeding purposes since entering the UK. The mare was subjected to routine swabbing by the owner's private veterinarian in accordance with the Horserace Betting Levy Board's (HBLB) Codes of Practice and the resulting swab was submitted to a private laboratory, which subsequently sent the suspect culture to the Veterinary Laboratories Agency (VLA) at Bury St Edmunds, Suffolk on 19th April. VLA confirmed that the isolate was positive.

Movement restrictions were imposed on the Oxfordshire premises under the Infectious Diseases of Horses Order (IDHO) 1987. A full tracing exercise was carried out to establish "at risk" horses. The owner of the mare was advised that the animal must not be used for breeding or "teasing".

Initial tracing revealed that at least two other mares on the premises were kept in close contact with this mare. A Veterinary Officer conducted an investigation to confirm the level of risk that this mare posed. Restrictions remained in place on the mare alone until repeat testing post treatment gave negative results. Tracing was also carried out to identify movements off the premises in recent months. All in-contact animals and those under investigation have since been released from restrictions and the UK is again CEMO free.



### Strangles

Two cases of strangles in Thoroughbreds have been confirmed this quarter. Both incidents have remained isolated cases and affected a single foal and a single mare on two breeding premises in Suffolk.

### Toxic and Parasitic Disease Report for the Second Quarter of 2006

A summary of diagnostic toxicosis and parasitology testing undertaken by contributing laboratories is presented in Tables 3 and 4 respectively.

**Table 3: Diagnostic toxicosis sample throughput and positive results for second quarter 2006**

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
Grass Sickness	20	16	9
Hepatic toxicoses	156	19	3

**Table 4: Diagnostic parasitology sample throughput and positive results for second quarter 2006**

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<b><u>Endoparasites</u></b>			
Ascarids	372	1	1
Coccidiosis	21	2	1
Cyathostomes	453	102	3
Dictyocaulus	1	1	1
Fasciola	2	0	1
Strongyles	123	21	2
Strongyloides	21	1	1
Tapeworms	109	10	1
Trichostrongylus	21	2	1
<b><u>Ectoparasites</u></b>			
Dermatophilus	26	2	2
Lice	56	2	2
Mites	235	9	5
Ringworm	65	8	4

### Report on *Post Mortem* Examinations for Second Quarter 2006

#### East Anglia

Abortion/Neonatal foal deaths:

Thirty two abortions and stillbirths or neonatal foal deaths were examined this quarter. Most submissions were of perinatal or neonatal foals, as would be expected at this stage in the breeding season. These foal submissions included seventeen cases of parturient hypoxia due to fetal malpresentation, fetal oversize or dystocia (affected mares included four TBs, one Shetland pony, one Trakhener and one Arab), two cases of



neonatal septicaemia, one case of endotoxaemia, one developmental anomaly, one case of non-infective post-partum foal death due to atelectasis and asphyxia, one case of generalised infection and microabscessation due to *Actinobacillus equuli* infection in a two day-old foal with failure of passive transfer of immunity, two cases of umbilical cord infection and subsequent sepsis in a 14 and a 10 day-old foal, one case of multiple rib fracture, ruptured colon and subsequent peritonitis due to rapid blunt trauma and one case of sacral fracture with associated Staphylococcal infection via the skin, epidural abscessation and sepsis. There was a single case of umbilical cord torsion in a Hackney foal. EHV infection was ruled out in all cases on the basis of negative tissue PCR results. No diagnosis was reached in three cases, including one case of abortion in a Quarter Horse and one stillbirth in a TB.

#### Adult Equine PME

Seventeen cases were examined at PME over the last quarter including myocardial lesions of unknown aetiology in a case of sudden death in a young TB at pasture, electrocution by a severed power-cable in a nine year-old Kladruber, a single case of grass sickness in a TB, thrombosis resulting in recumbency in an eight year-old TB, cervical vertebral osteosarcoma in an eight year-old TB and Equine Protozoal Myelitis in a two year-old TB; two neurological cases diagnosed with cranial trauma, one case of colonic rupture in a four-week old foal, one case of caecal rupture in a Thoroughbred in training and one case of femoral abscessation resulting from a penetrating injury to the groin. The other cases were of sudden death due to peritonitis and cardiovascular collapse, gastritis (failure to thrive), endocardial oedema (heart murmur), toxemia (post-op complications), endotoxaemia and disseminated lymphoma (in a horse presenting with profound weakness).

#### Home Counties

Eight full post mortem examinations were performed this quarter. Diagnoses included: sudden death as a result of clostridial enteritis in a foal and associated with cardiac enlargement in a 15 year-old pony, a displaced pastern fracture in an equine recovering from general anaesthetic, a single case of lymphoma affecting the hard palate and nasal cavity, two colics: a caecal/ colonic torsion and a case of enteritis and two foals: one dysmature with a patent urachus and one with pemphigus and pneumonia.

#### South West

A total of 18 cases were examined at PME this quarter. Single cases of grass sickness (diagnosis confirmed by histopathology), enteritis and hepatopathy, chronic nephritis and pyloric infarct, gastric rupture and omental tear, small intestinal obstruction and adhesions, peritonitis, lymphoma, colonic torsion, endotoxaemia, post-traumatic limb cellulitis and large colon necrosis and rupture in an eight day-old foal were diagnosed. Two cases of neglect were examined, one with severely overgrown feet and the other with mandibular osteomyelitis. Two cases of neurological disease were examined: one had a cervical vertebral malformation and the other had no diagnosis. There were two other cases with no diagnosis.

### **FOCUS ARTICLE: INTRODUCTION AND SUMMARY OF POST-MORTEM EXAMINATION INFORMATION FROM THE DONKEY SANCTUARY** **Alex Thiemann MRCVS, Donkey Sanctuary**

#### INTRODUCTION

Donkeys are frequently companion animals to horses and seen by many practitioners in equine and mixed practice. They do have a number of differences from the horse in both disease incidence and presenting signs. We aim to give an overview of the problems encountered in our new intakes and special problems encountered from time to time.



The Donkey Sanctuary was founded in 1967 by Dr Elizabeth Svendsen, OBE. Originally the Sanctuary existed to provide lifelong care



to neglected donkeys, however the remit of the Sanctuary has now grown to encompass welfare of donkeys in the widest possible sense of the word.

Since starting out we have taken into care 11,800 donkeys and rehomed over 2000 of them. There are centres for special needs children to ride and drive donkeys at Sidmouth, Birmingham, Manchester and Leeds with a new centre opening in Plymouth shortly.

Our work overseas continues to expand with veterinary care and teaching being provided in numerous developing countries including Ethiopia, Kenya, India, Mexico and Egypt. Education is a priority and we provide veterinary surgeons to teach at several veterinary schools and farriery colleges both in the UK and abroad, and produce a number of information sheets for vets and owners.



Our clinical facilities include a well equipped hospital and pathology laboratory where all our haematology, biochemistry and faecal egg counts are carried out, also all donkeys that die are examined by a full post mortem.

Our resident herd is a closed herd and problems arise mainly due to chronic geriatric conditions. New donkeys are isolated for 6 weeks and monitored closely for infectious disease. Due to the stress of travel and mixing this is the time when we may see

recrudescence of latent EHV and a higher incidence of hyperlipaemia.

#### POST MORTEMS AT THE SANCTUARY

Donkeys are examined post mortem at the Sanctuary as part of general disease surveillance. The findings also inform the attendant clinician with regard to diagnosis and appropriateness of treatment regimens. The data base of information and images which we have developed is not only a useful teaching aid but also permits us to define the profiles of disease in the ageing population at the Sanctuary. There is a strong commitment to non-invasive research and the database can be usefully interrogated for a series of research projects on which we are embarked. Dental disease, pancreatitis and impaction colic are topics currently being investigated.

The prevalent problems seen here differ from those found in younger working donkeys with conditions attendant on generous feeding causing problems for the non working companion animal. Trying to limit intake just to maintenance requirements in an animal that is naturally adapted to a diet solely of coarse fibre can be very difficult. This is especially so in the verdant South West. Cutting back diets can be problematic as hyperlipaemia develops readily when intake drops sharply particularly in fussy feeders and frequently compounds any clinical problem.

Chronic hoof disease from repeated bouts of laminitis resulting in pedal bone rotation and founder is a frequent reason for euthanasia. In aged animals this is often complicated by chronic arthritic damage mainly of the shoulder joints. Cushings disease does feature as an underlying problem in some of these chronic foot disease cases but it is an unusual finding.



Hepatopathy presents problems relatively often. Many are cases of age related fibrosis which is an insidious condition, as are the fairly numerous cases of neoplasia of the liver. Whilst more acute fatty liver disease does occur occasionally it has become relatively unusual now with firmer control over diet. Haemorrhagic disorders often result from hepatic damage and we have found an association of hepatopathy with necrotising pancreatitis.

Impaction colic is a frequent cause of euthanasia often being intractable to treatment due to late presentation in this stoical species. This is more often seen during the housing period and in animals with marked dental disease. The impaction is usually from dense balls of long unmasticated fibre.

Neoplasia, as might be expected in aged animals, is commonly encountered. Bile duct carcinomata are currently the most frequently encountered neoplasms but not unexpectedly we have seen tumours in virtually all organ systems. A large number of donkeys present with sarcoids.

Chronic fibrosing pneumonitis is a common clinical problem occasionally resulting in euthanasia. This condition has been associated with asinine herpes type four virus and often lesions may be confined to thick firm white sub pleural sheets over the dorsum but active infection can result in fulminant disease.

Cardio-vascular disease is seen to some extent in virtually all aged donkeys. There is a very high frequency of aneurysms mostly in the cranial mesenteric artery in the absence of worm damage. Aneurysms may also be found in the aorta. Thrombic disease is associated with some larger aneurysms but has often been found affecting the hepatic portal as a consequence of neoplasia in the liver. Arteriosclerosis lesions are seen in most aged donkeys and occasionally severe protuberant mineralised lesions likely to cause marked turbulence in blood-flow may exacerbate cardiac problems. The main defects seen in hearts are sclerosis of the aortic valve cusps followed by sclerosis of the bicuspid. Small infarcts are occasionally seen. Endocarditis seems extremely rare.

With a strict parasite control programme at the Sanctuary, other than in new arrival animals in isolation there are minimal worm problems, however resistance to moxidectin has recently been reported (1) and clinical cyathostomiasis is occasionally encountered. Old mineralised hydatid cysts however, survive through many years of the programme and are an incidental finding at necropsy.

This is just a snapshot of our necropsy findings. The stoic nature of donkeys is such that at necropsy it can be surprising to find the extent of the pathology in an animal which might have appeared mildly off colour although relatively content to the inexperienced eye.

#### **Reference**

1 – Trawford A.F., Burden F. and Hodgkinson J. (2005). Suspected moxidectin resistance in two donkey herds at The Donkey Sanctuary. Proceedings WAAVP



### ACKNOWLEDGEMENTS

**This report was compiled by the Animal Health Trust.  
We are extremely grateful to the following laboratories for contributing data for this report.**

Avonvale Veterinary Practice  
Beaufort Cottage Laboratories  
BioBest Laboratories Ltd  
Chine House Equine Veterinary Hospital  
Donkey Sanctuary  
Equine Veterinary Hospital, Arundel  
Greenwood, Ellis and Partners  
Hampden Veterinary Hospital  
Liphook Equine Hospital  
NationWide Laboratories  
O’Gorman Slater and Main  
SAC Veterinary Services  
Three Counties Equine Hospital, Kearns and Rea  
University of Bristol, Department of Pathology  
University of Liverpool, Equine Hospital, Leahurst  
Vetlab Services Ltd  
Veterinary Laboratories Agency

All laboratories contributing to this report operate Quality Assurance schemes. These schemes differ between laboratories, however, all the contagious equine metritis testing reported was accredited by the Horserace Betting Levy Board with the exception of the VLA, which acts as the reference laboratory.

**We would welcome feedback including contributions on focus articles  
and/or case reports to the following address:**

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