



**DEFRA / AHT / BEVA
EQUINE QUARTERLY DISEASE
SURVEILLANCE REPORT
Volume 5, No.3: July – September 2009**



Highlights in this issue:

- **The risk of importation of equine piroplasmiasis into the United Kingdom**
- **Equine Influenza expert surveillance panel**

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

<u>INTRODUCTION</u>	3
<u>VIROLOGY DISEASE REPORT FOR THE THIRD QUARTER OF 2009</u>	7
VIROLOGICAL DIAGNOSES FOR THE THIRD QUARTER OF 2009	8
<u>THE EQUINE INFLUENZA EXPERT SURVEILLANCE PANEL</u>	9
<u>TOXIC AND PARASITIC DISEASE REPORT FOR THE THIRD QUARTER 2009</u>	14
<u>THE RISK OF IMPORTATION OF EQUINE PIROPLASMOSIS INTO THE UNITED KINGDOM</u>	16
<u>REPORT ON POST-MORTEM EXAMINATIONS FOR THE THIRD QUARTER 2009</u>	18
EAST ANGLIA	18
HOME COUNTIES	18
SOUTH WEST	19
WEST MIDLANDS	19
SCOTLAND	19
NORTHERN IRELAND	21
<u>ACKNOWLEDGEMENTS</u>	23



Introduction

Welcome to the third quarterly equine disease surveillance report for 2009 produced by Department of Environment, Food and Rural Affairs (Defra), British Equine Veterinary Association (BEVA) and the Animal Health Trust (AHT). 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.

National disease occurrence

On 22nd October 2009, the Department for Environment, Food, and Rural Affairs (Defra) confirmed a single subclinical case of **contagious equine metritis (CEM)** in a seven year old non-Thoroughbred mare on premises near Milton Keynes, Buckinghamshire, England. The mare had entered the United Kingdom from mainland Europe two years previously. The diagnosis was made on the basis of initial agent identification (*Taylorella equigenitalis*) in a sample submitted to a private Horserace Betting Levy Board (HBLB) quality approved laboratory with subsequent confirmation by culture and qPCR by the Veterinary Laboratories Agency (VLA) Reference Laboratory at Bury St Edmunds, Suffolk. Restrictions have been placed, a veterinary investigation initiated and treatment of the mare undertaken in accordance with the HBLB Codes of Practice. Initial investigations have indicated that this is a separate incident to that reported previously in July 2009, which involved a single non-breeding, non-Thoroughbred competition stallion. Defra declared that first incident resolved on 10th September 2009, following successful treatment of the affected animal and with no onward transmission having been identified. The stallion was treated and tested negative according to the HBLB code of practice, and was re-exported to mainland Europe ([Click here](#)).

This autumn an unusually high prevalence of **atypical myopathy** has been reported in the UK and in Northern Europe by the University of Liege's Equine Atypical Myopathy Alert Group ([Click here](#) and [here](#)).

For the first time we include in this report the results from the **equine piroplasmosis serology** at the **VLA** (p. 13).

International disease occurrences

A non-breeding, Thoroughbred stallion has tested positive for *Taylorella equigenitalis* whilst in pre-export quarantine in **Dubai, UAE**. The horse was born in the USA in March 1998 and exported to the UK as a yearling where it went into race training. In October 2001 the horse was exported to the UAE to a racing yard and was then sold to a private owner in 2003. The horse has been resident on an equestrian centre and used for dressage for the last 6 years. The horse was routinely tested whilst in quarantine before being due for re-export back to the UK, for retirement onto a stud farm. **CEM** swabs, taken on 14th October, were tested at the UAE national laboratory CVRL where *T. equigenitalis* was cultured. A confirmatory subculture from the first sample was then sent to VLA, Weybridge, UK, who confirmed *T. equigenitalis* by both culture and PCR. Enquires have confirmed that the horse has not been used for breeding during its time in the UAE and the UAE has not previously reported a clinical case of CEM. The origin of this subclinical infection remains unclear as investigations continue; including testing in contact horses in the UAE. The horse has now been treated and is being re-swabbed for CEM ([Click here](#)).



The **CEM** outbreak which started in 2008 in the **U.S.** is still continuing as reported by the OIE ([Click here](#), please see also previous reports Vol. 4, No. 4 and Vol. 5, No. 1 and 2 [Click here](#)), although no new cases have been reported since June 2009.

At the beginning of October 2009 another outbreak of **equine piroplasmiasis (*Theileria equi*)** was reported in Texas, U.S. (for details of previous outbreak [click here](#)). As of 11 November 2009 the National Veterinary Services Laboratories (NVSL) have confirmed equine piroplasmiasis in 317 horses. Two hundred and eighty-eight *T.equi* positive horses are located on the index ranch in Texas, seven are on other premises in Texas, one is in Alabama, two are in California, five are in Florida, one is in Georgia, five are in Louisiana, one is in Minnesota, two are in Tennessee and one is in Wisconsin. All these horses are under quarantine. Additional tick investigation is continuing and epidemiologically linked horses are being tested. No treatment is allowed for affected animals ([Click here](#)).

On 8th September 2009 the **Irish** Department of Agriculture, Fisheries and Food has confirmed the occurrence of **equine piroplasmiasis** in a number of thoroughbred horses in a racing yard in county Meath. A notifiable disease in Ireland since July 2009, it has not been officially reported in this country before although it is understood that a previous incursion did take place. The only three clinical cases occurred in late June. Those three affected horses were presented with fever, anaemia and poor performance. Since then no more clinical cases were reported. Further sampling of all animal in the index stable showed 28 of 60 positive in ELISA tested on 7th September 2009. Movements of horses were traced from these index premises which resulted in 11 additional positive animals that had originated from this yard. An additional eight seropositive horses (out of 102 susceptible) were found on a rest farm in Wexford County which was used by the index racing stable. No evidence of disease was recorded in these horses and no transmission external to the index holding have been identified ([Click here](#)). Investigations are ongoing.

In **Israel**, cases of **equine encephalosis** (orbivirus, transmitted by *Culicoides* species) are being reported throughout the country, similar to the last disease season (October 2008 to January 2009). The symptoms consist mainly of elevated body temperature and inappetence for several days and 90 per cent of horses recover without complications ([Click here](#)).

In this quarter, **Venezuelan equine encephalitis (VEE)** was confirmed in Costa Rica and Belize. Belize reported eight outbreaks including 12 cases and 977 susceptible equidae which mean an unexpected increase in morbidity and mortality of this listed disease. In this quarter, the **Belize** Agricultural Health Authority (BAHA) has confirmed eight outbreaks of **VEE**. These outbreaks are continuing (or date resolved not provided), and have involved 977 susceptible horses, 12 cases and four deaths. This numbers mean an unexpected increase in morbidity and mortality of a listed disease. In the same country an outbreak of **Eastern equine encephalomyelitis (EEE)** was diagnosed in July 2009. **Costa Rica** has also reported three outbreaks of VEE. VEE is a mosquito-borne viral disease of all equine species that can transmit to humans, being spread primarily by mosquitoes. Control measures have been applied in response to the outbreaks, including vector control activities in the affected areas, as well as quarantine and vaccination of susceptible horses ([Click here](#)).



Defra business

African Horse Sickness Consultation

Defra is planning to issue a public consultation to invite comments on our plans to change existing legislation on the control of African Horse Sickness (AHS).

Our legislation on the control of AHS in England must be consistent with that of the European Union (European Union Council Directive 92/35/EEC). This Directive maintains the fundamental principles of disease control as in most other Directives and domestic legislation dealing with exotic notifiable diseases.

We have concluded that the present domestic controls require supplementing in case of a future outbreak in order to effectively implement this Directive.

Our objective is to not only ensure that we have in place effective measures to control outbreaks of AHS, but also to create AHS specific domestic legislation that closely follows the requirements of the European Union Council Directive 92/35/EEC.

We have therefore developed a new Statutory Instrument for AHS (through transposing European Union Council Directive 92/35/EEC) together with a Control Strategy for the disease.

This consultation invites views on how we plan to implement the EU requirements in England as set out in the draft SI.

The draft legislation and control strategy have been developed in partnership with the equine sector and are specifically designed to raise both Government and Industry preparedness for an incursion of AHS. The Control Strategy explains how the powers contained in the legislation will actually be used in the event of an outbreak.

We are planning to make both documents available for a 12 week public consultation at the turn of the year, and we are inviting views and comments on these proposals.

History

The threat of an equine exotic disease in GB has until now been a low priority issue compared to that of other exotic diseases. There have been few equine exotic disease outbreaks occurring within the UK and the veterinary advice is that there is a low risk of African Horse Sickness virus entering the country.

African horse Sickness (AHS) is an exotic disease that is fatal to horses and also affects mules, donkeys and zebras. It has never occurred in the UK and there are no public health implications. The disease is currently confined to sub-Saharan Africa but there have been occasional outbreaks in Northern Africa. The most recent incursion in Europe was in Spain in the late 1980's, which was associated with the import of infected zebras from Africa. The disease is carried and spread by the same *Culicoides* midge vectors as Bluetongue, with the speed of the spread dependant on weather and wind conditions.

The outbreak of midge-borne Bluetongue disease in farm animals in recent years has demonstrated the potential for insect vector-borne diseases to have unexpected and significant detrimental consequences for the sector and the rural economy. Although AHS is the most prominent of the vector-borne diseases to affect horses, there is no evidence



to suggest that there is a significant threat increase on the horizon. Although the risk of incursion into England of AHS is low, the impact on the Industry and Government should it arrive is very high, potentially causing severe damage to the equine industry through the direct loss of susceptible animals, and damage to related industries and trade.

It is important to note that in introducing this new legislation our policy is not changing, just how the disease control requirements are presented in a single domestic regulation. It meets Defra's commitment to better regulation and simplification principles and provides for clearer more effective disease control that should lead to the potential number and size of disease outbreaks being reduced. This will minimise disruption to the equine sector and related industries to the extent possible, thus benefiting those industries, the UK government and its delivery partners, and the wider economy in the event of a disease outbreak.

Defra will be conducting this consultation with regard to England only. Separate consultations on similar provisions will be undertaken in Scotland, Wales and Northern Ireland.

Focus articles

With regards to the two recent outbreaks of equine piroplasmiasis in Ireland and the U.S. we are pleased to include a focus article from Alex Thiemann, MA, Vet MB, Cert EP, MRCVS from The Donkey Sanctuary in Devon and from Paul Phipps, Veterinary Laboratories Agency, Weybridge, about the risk of importation of equine piroplasmiasis into the UK.

Dr. Jenny Mumford, Chair of the equine influenza expert surveillance panel and Neil Bryant, PhD from the virology department of the Animal Health Trust contribute a report about the work of the equine influenza expert surveillance panel.

We reiterate that the views expressed in these focus articles are the authors' own and should not be interpreted as official statements of Defra, BEVA or the AHT.

Access to all of the equine disease surveillance reports can be made on a dedicated page on the Animal Health Trust website at http://www.aht.org.uk/equine_disease.html or via the BEVA and Defra websites:

<http://www.beva.org.uk/>

<http://www.defra.gov.uk/foodfarm/farmanimal/diseases/vetsurveillance/reports/listing.htm>

We would remind readers and their colleagues that a form is available on the AHT website for registration to receive reports free of charge, via e-mail, on a quarterly basis. The link for this registration form is available via

http://www.aht.org.uk/equine_disease_registration.html.



Virology Disease Report for the Third Quarter of 2009

The results of virological testing for July to September 2009 are summarised in Table 1 and include data relating to Equine Viral Arteritis (EVA), Equine Infectious Anaemia (EIA) and West Nile Virus (WNV) 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 (EVA and EIA). VLA now provides testing for WNV as part of clinical work up of neurological cases on specific request and provided the local DVM has been informed.

Table 1: Diagnostic virology sample throughput and positive results for the third quarter 2009

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<u>Serological Tests</u>			
EVA ELISA	599	14 [#]	4
EVA VN	262	41 [#]	4
VLA EVA VN	531	13 [#]	1
EHV-1/-4 CF test	512	12 [*]	1
EHV-3 VN test	3	0	1
ERV-A/B CF test	260	4 [*]	1
Influenza HI test	293	9 [*]	1
EIA (Coggins)	119	0	3
EIA ELISA	281	0	3
VLA EIA (Coggins)	1320	0	1
VLA WNV (PRNT)	0	0	1
<u>Virus Detection</u>			
EHV-1/-4 PCR	12	3	1
EHV-2/-5 PCR	4	0	1
Influenza NP ELISA ^{**}	272	2	2
Influenza Directigen	100	0	1
Influenza VI in eggs	0	0	1
EHV VI	135	7	1
EVA VI/PCR	3	0	1
VLA EVA VI/PCR	15	0	1
Rotavirus	40	5	6

ELISA = enzyme-linked immunosorbent assay, VN = virus neutralisation, VLA = Veterinary Laboratories Agency, CF = complement fixation, HI = haemagglutination inhibition, Coggins = agar gel immuno diffusion test, PCR = polymerase chain reaction, NP = nucleoprotein, VI = virus isolation, EVA = equine viral arteritis, EHV = equine herpes virus, ERV = equine rhinitis virus, EIA = equine infectious anaemia
= Seropositives include vaccinated stallions, * = Diagnosed positive on basis of seroconversion between paired sera
** = The relatively high number of NP ELISA tests performed is largely due to requirements for international equine movement. All horses travelling to Australia must now have 2 NP ELISA tests performed prior to travel. The figures above include tests performed for international trade purposes.



Of the 13 EVA VN positives detected by the VLA, nine were export samples, one was an AI sample and three samples were from overseas. The 15 semen samples received for EVA testing were all negative on virus isolation and RT-PCR.

The 1320 agar gel immuno diffusion tests for EIA (AGID; Coggins) were conducted for international trade purposes and they were all negative.

Virological Diagnoses for the Third Quarter of 2009

EHV-1 Abortions

No cases of EHV-1 abortion have been diagnosed in this quarter.

EHV-1 paralytic disease

No cases have been reported in this quarter.

EHV-4 Respiratory infection

In a yearling showing respiratory signs, EHV-4 was isolated from a nasopharyngeal swab.

EHV-2

In three animals EHV-2 was isolated from a nasopharyngeal swab.

Equine Influenza

In Herefordshire, England a 12 year old unvaccinated pony stallion which showed respiratory signs, tested positive for equine influenza by nucleoprotein ELISA on a nasopharyngeal swab. Subsequently influenza virus was isolated and sequenced. The isolate belonged to clade 1 of the Florida sublineage of the American lineage of H3N8 equine influenza virus. Clade 1 viruses are still relatively rarely isolated in Europe (so far only in Sweden; Lincolnshire and Cheshire, UK although they have increased recently as a proportion of EIV isolations). They have been more commonly found in the U.S. and Japan and were associated with the outbreak in Australia in 2007.

The results of a paired haemagglutinin inhibition test suggested infection with equine influenza virus prior to the time of the first sample. The outbreak was thought to have started after three ponies from this yard returned from a local show and subsequently developed clinical signs. Vaccination against influenza is not mandatory for attendance at many of the local shows. The infections spread through the whole yard of about 35 animals, but as the signs were mild only five ponies required treatment.

In Kent, England a seven year old un-vaccinated pony gelding which showed nasal discharge, coughing, anorexia and pyrexia, tested positive for equine influenza by nucleoprotein ELISA on a nasopharyngeal swab and the equine influenza RT-PCR test on the same nasopharyngeal swab confirmed the previous positive result. Unfortunately no virus could subsequently be isolated.

EHV-3

No cases have been observed in this quarter.



The Equine Influenza Expert Surveillance Panel

Dr. Jenny Mumford, Chair of the Equine Influenza Expert Surveillance Panel
Neil Bryant, PhD, Virology Department, Animal Health Trust

The Equine Influenza surveillance panel was created in order to improve the efficacy of equine influenza vaccines by ensuring that vaccines contain epidemiologically relevant strains. The catalyst for this initiative was the 1979 epidemic of A/equine 2 (H3N8) virus which seriously affected racing in the UK and Europe. At the time it was not known whether the failure of vaccines in the face of the epidemic was a result of inadequate potency, inappropriate vaccination schedules or antigenic drift from the original prototype strain A/equine /Miami/63 included in vaccines.

Funded by the Horserace Betting Levy Board a collaboration to improve equine influenza surveillance was set up between the Royal Veterinary College and two WHO laboratories, the National Institute of Medical Research and the National Institute of Biological Standardisation and Control, the former being the WHO World Reference Laboratory for Influenza and the latter the WHO Reference Laboratory for Influenza Vaccine standards.

The conclusion and recommendations of the first meeting held in 1983 highlighted the need for a much higher level of surveillance and virus collection and characterization, modernization of methods of vaccine standardization and the development of a challenge system in horse so that vaccines could be tested in the target species. It was agreed that there was a strong case for modelling the standardization of vaccines and surveillance systems for equine influenza on those already in place for human influenza. However at that time the numbers of viruses available for characterization were woefully inadequate as a basis for any conclusions on relevant strains for vaccines. As a result the choice of strains for updating vaccines following the 1979 outbreak was largely based on geographic and market considerations with American manufacturers opting for an American virus A/equine /Kentucky /81 and European manufacturers in general opting for European strains such as Fontainebleau/79 , Brentwood/79 and Borlange/79.

As a result of the introduction of mandatory vaccination in 1981 for racing thoroughbreds by the Jockey Clubs of the tripartite countries (England, Ireland and France) together with some other European countries, the racing industry of the UK committed to a long term program to monitor vaccine efficacy used in the mandatory vaccination program and to conduct ongoing surveillance of equine influenza. It was recognized that before a formal vaccine strain selection process could be introduced a much greater level of surveillance was required on a worldwide basis. The OIE designated three laboratories in Germany, England and USA (Kentucky) who had the remit to improve the level of surveillance, virus collection and characterization.

It was almost 10 years before it was agreed that the numbers of viruses being examined was sufficient to provide a meaningful basis for vaccine strain selection but at the second meeting of WHO and OIE experts which was held following the 1989 epidemic of influenza, it was recommended that an Expert Surveillance Panel should be set up which included 3 WHO reference laboratories, 3 OIE reference laboratories and a Scandinavian laboratory which was very active in equine influenza surveillance.



It has become apparent that antigenic drift in equids is slower than in humans and that equine serum is more cross-reactive than ferret serum used for characterisation.

The challenge for the Expert Surveillance panel is to identify the point at which the majority of isolates have undergone significant antigenic drift such that a strain change is called for. They have been assisted in this task with the application of antigenic cartography, a visual means by which the progress and direction of antigenic change can be followed. Decisions to recommend an update are only made when all criteria are met i.e. differentiation by viruses using HI and ferret sera, infection in fully vaccinated horses in the field and when available lack of protection in experimental challenge studies.

The first formal recommendation to update strains was made in 1993 and referred to the need to replace strains from 1979-1981 with viruses isolated in 1989. Subsequently with the discovery that the H3N8 lineage had diverged into two sublineages designated European and American, a recommendation was made that vaccines should contain representative of both lineages represented by Suffolk/89 and Newmarket/2/93 as European lineage viruses and Newmarket/1/93 and Kentucky 1994 as American lineage viruses. It was not until 2004 that the panel recommended that a further update was necessary for the American lineage viruses and that the 1993/1994 viruses should be replaced by viruses antigenically similar to South Africa/2003. This decision was based on field infections in vaccinated horses and antigenic differences determined in HI tests using ferret sera.

In spite of the fact that there are licensing regulations in place to facilitate the speedy updating of strains (EMA Guidelines), vaccine manufacturers have been slow to follow recommendation preferring to promote the cross protection remaining even though protection is not optimal with outdated strains. It was only in the latter half of 2008 an update vaccine became available in USA and in mid 2009 in Europe. Many of the market leaders did not adopt the recommendations when first published, claiming that without provision of extraneous agent tested seed viruses the updating process was more onerous than that expected of human influenza manufacturers. This in fact is a misconception as the panel only recommends that vaccine viruses selected should be antigenically indistinguishable from the recommended strain thus allowing manufacturers to select regional isolates and those with the most advantageous growth characteristics. This is in line with the human influenza system.

The key point to appreciate is that while outdated vaccine will still provide a measure of immunity, a mismatch of strains generates a situation where vaccine provide quite reasonable clinical protection such that the disease is mild and short lived, but that these infected animals shed large amounts of virus and fuel spread of infection. International travel of horses for racing relies on vaccination to control infection and the equine industry has stated that it requires products which minimize virus excretion. Thus there are significant benefits to using the best quality vaccines containing up to date strains.

The recent epidemic of equine influenza in Australia highlights the huge economic consequences of major epidemics and underlines the importance of supporting schemes which contribute to better vaccines through appropriate selection of strains and monitoring that products meet the potency standards laid down by OIE.

The current surveillance data shows that Florida sublineage viruses from clades 1 and 2 are circulating in the Europe and are causing sporadic disease mainly in unvaccinated horse populations. Antigenically there were no major differences between the currently



circulating strains and those characterised previously using ferret antisera from 2005 to 2007, suggesting limited antigenic drift has occurred. In the USA two characterised isolates belonged to the Florida sublineage clade 1 as was the case in 2006-2007 and were antigenically similar to the previous isolates. There was no evidence of Florida clade 2 viruses circulating in North America. Interestingly the viruses circulating in Mongolia, India and China have been classified as Florida sublineage clade 2 viruses similar genetically to those circulating in Europe.



Bacteriology Disease Report for the Third Quarter 2009

A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Table 2. For contagious equine metritis (CEM) 22 of 27 HBLB approved laboratories contributed data.

VLA CEMO Data for the period July to September 2009

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.

As already mentioned in the last report (Vol.5, No. 2), in this quarter one isolate was identified as CEMO positive by the VLA in a subclinically infected non-Thoroughbred stallion with no known sexual contact with the other 23 horses at premises in Hertfordshire, England. The stallion had entered the United Kingdom from mainland Europe one month previously. He was imported for competition rather than breeding purposes. The stallion was clinically healthy and was swabbed for CEM as part of a pre-export procedure.

Strangles

Strangles remains endemic in the UK, especially among parts of the non-Thoroughbred horse population. Diagnoses are confirmed in the UK based on traditional culture of *S. equi* and qPCR on respiratory samples and/or seroconversion using a serological ELISA.

Table 2: Diagnostic bacteriology sample throughput and positive results for the third quarter 2009

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
CEMO (HBLB)	757	0	22
CEMO (VLA)	1645	1	1
<i>Klebsiella pneumoniae</i>[#]	708 ¹	11	18
<i>Pseudomonas aeruginosa</i>	707 ¹	11	19
Strangles*culture	1327	108	14
Strangles PCR	663	86	1
Strangles ELISA	1183	247	1
Salmonellosis	263	6	15
MRSA	1461	0	6
<i>Clostridium perfringens</i>	72	6	7
<i>Clostridium difficile</i> (toxin by ELISA or immunochromatography)	68	8	6
Borrelia (by ELISA)	21	8	1
<i>Lawsonia intracellularis</i>**	23	2	3

CEMO = contagious equine metritis organism (*Taylorella equigenitalis*); HBLB = HBLB accredited laboratories; [#] =capsule type 1,2,5; VLA = VLA reference laboratory; **Streptococcus equi* subsp. *equi*; MRSA = methicillin resistant *Staphylococcus aureus*. ** *Lawsonia intracellularis* identified using PCR applied to faeces; ¹ reproductive tract samples only

VLA Salmonella results

From the strains typed by the VLA there were three cases of *S. agona*, one of *S. mbandaka* and three of *S. typhimurium*. Each of the seven positive samples represents one incident.



The following definition of an incident applies: “An incident comprises the first isolation and all subsequent isolations of the same serovar or serovar and phage/definitive type combination of a particular Salmonella from an animal, group of animals or their environment on a single premises, within a defined time period (usually 30 days).”
For more information about Salmonella in the UK please [click here](#).



Toxic and Parasitic Disease Report for the Third Quarter 2009

A summary of diagnostic toxicosis and parasitology testing undertaken by contributing laboratories is presented in Tables 3 and 4 respectively. Results for toxicosis are based on histopathologically confirmed evidence of disease only (where applicable).

Table 3: Diagnostic toxicosis sample throughput and positive results for the third quarter 2009

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
Grass Sickness	9	5	3
Hepatic toxicoses	15	6	4
Atypical myopathy	0	0	0
Tetanus	0	0	0

Table 4: Diagnostic parasitology sample throughput and positive results for the third quarter 2009

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<u>Endoparasites</u>			
Ascarids	1135	29	11
Cyathostomes	799	162	7
Dictyocaulus	623	2	6
Strongyles	2056	403	16
Tapeworms (ELISA based testing)	3	1	2
Tapeworms (Faecal exam)	1458	7	8
Trichostrongylus	27	4	1
Strongyloides	1525	17	10
Oxyuris equi	119	1	3
Fasciola	27	1	1
Coccidia	48	11	2
Cryptosporidia	5	0	2
VLA Theileria equi (CFT)*	452	9	1
VLA Theileria equi (IFAT)**	678	24	1
VLA Theileria equi (cELISA)***	250	14	1
VLA Babesia caballi (CFT)*	452	2	1
VLA Babesia caballi (IFAT)**	670	9	1
VLA Babesia caballi (cELISA)***	250	2	1
<u>Ectoparasites</u>			
Mites	24	1	1
Lice	215	0	7
Ringworm	447	146	14
Dermatophilus	356	7	11
Candida	65	6	2

*Complement Fixation Test; CFT suspect/positive samples are tested in IFAT test

Indirect Fluorescent Antibody Test; *competitive Enzyme-linked immunosorbent assay; positive cELISA results are not undergoing confirmatory testing



Grass sickness surveillance data (www.equinegrasssickness.co.uk):

A total of 23 EGS cases have been received for the third quarter (July-September 2009), making a total of 103 reports in 2009. The type of grass sickness was reported for 21 cases with 13 (62%) acute cases, 5 (24%) subacute cases and 3 (14%) chronic cases. All of the cases in this quarter were fatal. Four of the acute cases underwent surgery, while 8 horses in total were diagnosed after post-mortem examination. Eleven of these 12 horses had gold-standard diagnosis by means of ileal biopsy or ganglia examination.

The location of one case was not disclosed, with 13 cases reported from England, 7 from Scotland, 2 from Wales.

Of the affected horses 56% were geldings, 39% were mares and 4% were stallions. A range of ages was reported (1 year – 20 years) with the mean age 7.6 years and the median 5 years. The breed of one horse was unknown, with 10 cross breeds and 12 pure breeds reported in this quarter.

It should be noted that the grass sickness surveillance scheme receives data from a wider population in comparison to the data presented in Table 3 and different diagnostic criteria were used. For more information about the grass sickness surveillance please refer to previous reports published in Vol.4 No.2 and Vol.2 No.4.



The risk of importation of equine piroplasmosis into the United Kingdom

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Paul Phipps, Veterinary Laboratories Agency, Weybridge

Equine piroplasmosis (EP) is likely to be unfamiliar to the majority of UK equine practitioners as the UK is currently considered free of the disease. However there is a considerable risk of the importation and establishment of EP due to a number of factors. The purpose of this focus article is to raise awareness and improve monitoring of the situation, by providing a brief overview of the disease, its distribution and transmission.

EP is a tick borne protozoal infection; its distribution has historically been determined by the presence of suitable tick vectors and habitats, and stable equine populations. While it is widely seen in the tropics and subtropics, many European countries are also considered endemic for EP. For a full list of country information the World Animal Health International Database (WAHID) of the OIE at the following website, provides maps and updated surveillance reports: [Click here](#).

The parasites *Theileria equi* and *Babesia caballi* are the causative agents of EP. After transmission by the feeding activity of infected ticks, they proceed to multiply in equine erythrocytes, resulting in haemolysis and inflammatory changes (*T.equi* undergoes schizogony within lymphocytes prior to entering the lymphocytes). In equines with no prior exposure an acute or per-acute syndrome may occur with signs including severe anaemia, petechiated and jaundiced mucous membranes, haemoglobinuria, pyrexia, and even death. In less severely affected cases various degrees of chronic signs occur which may mimic other causes of weight loss and general inflammatory conditions.

Equines that are stressed either by exertion (performance athletes), or by immune compromise (foals, geriatric and “working equines”) are particularly at risk of severe disease.

In countries where the disease is endemic, constant exposure to sufficient infectious ticks allows a state of “endemic stability” to exist and hence equines from these countries may show none or only very mild clinical signs. As the infection can persist for years or lifelong these carriers may remain infectious to other ticks in the future.

It is important to note that while ticks are the usual route for transmission, in-utero and iatrogenic infection can occur, and have been recorded in the UK. A recent large outbreak of EP in Florida, in which 20 horse were destroyed, was traced to needle re-use. Procedures such as dentistry, stomach tubing, contaminated semen and blood transfusion may also allow spread between horses.

In acute cases diagnosis may be made by direct examination of blood smears but this is not always accurate and for screening purposes or detection of carrier equines serology is required. The current tests used for international trade are a competitive ELISA or Indirect Immuno-Fluorescent Antibody Test (IFAT). These tests are available at the VLA, Weybridge.

Clinical cure may be easy to achieve, but it’s very difficult to prevent longterm carrier status. Although *B. caballi* infection may be sterilised, it is questionable whether full



sterilisation of *T.equi* infections may be achieved with available babesicides and infected horses may remain carriers for life. Suitable drugs are not readily available in the UK and the risk of adverse side effects is relatively high.

There is increasing international travel and importation of equines into the UK, some of these movements are not as well regulated as would be desirable, especially at the lower end of the market and there is no EU regulation or OIE guidelines regarding pre-import acaricide treatment of horses. Currently the UK has a Tripartite agreement with France and the Republic of Ireland such that a health certificate or pre-export veterinary check is not required for “any registered equidae and equidae for breeding and production” imported from these countries ([Click here](#)).

The implication of this is that carrier equines and/or infective ticks may be introduced into the UK without hindrance. It is pertinent to note that the results of tick surveillance in Great Britain (Vet Record, August 2009) record importation of *Hyalomma marginatum marginatum*, an exotic tick and known vector of EP, on a horse originating from Portugal and increasing populations of *Dermacentor reticulatus* throughout south east England, potentially capable of vectoring EP. The results of increasing global temperatures may favour the establishment of such populations, and already autochthonous infection has been recorded in Normandy, France.

Interestingly the situation regarding companion animal movement as regulated by the PETS transport regulations does specify compulsory treatment against ticks prior to leaving Europe, and disease incidence is monitored on a voluntary basis by the DACTARI scheme (Dog and Cat Travel And Risk Information). A similar practice would be beneficial if it were to also apply for horses.

At present the equine industry is thus vulnerable to the introduction of EP and as no legal requirements exist to limit its incursion from parts of Europe, it is up to individual practitioners to advise clients considering importing equines. Recommendations may include blood testing and tick removal prior to import, and a period of quarantine on arrival. For an exhaustive list of precautions the reader is recommended to examine the document provide by the USA in preparation for the World Equestrian Games in 2010 ([Click here](#)).

Practitioners are also urged to i) notify positive EP results to the DEFRA/AHT/equine disease surveillance scheme, and ii) send ticks found on imported horses to the HPA tick surveillance scheme (contact: Lisa Jameson, Emerging Infection Scientist, Health Protection Agency, Porton Down, Salisbury, Wiltshire, SP4 0JG, Lisa.Jameson@hpa.org.uk).

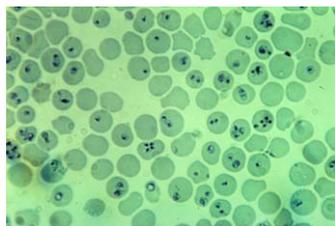


Fig. 1

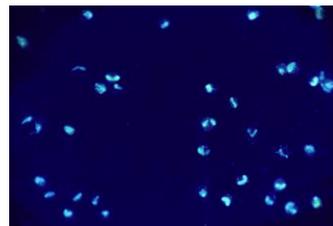


Fig. 2

Fig. 1: *Theileria equi* in Giemsa stained thin blood film

Fig. 2: Fluorescing *Babesia caballi* in IFAT



Report on Post-mortem Examinations for the Third Quarter 2009

East Anglia

A total of 23 cases were examined including 8 aborted fetuses.

Of the aborted fetuses examined this quarter, umbilical cord torsion was suspected as the precipitating cause in 7 of 8 cases. No definitive cause was determined for one case aborted at approximately 120 days of gestation, however infectious agents were excluded.

A case of neonatal death was associated with postnatal asphyxia syndrome.

A 14 month old Przewalski horse was found dead at pasture. Post mortem examination revealed strangulation of distal small bowel caused by a tight band across the mesenteric root.

Post mortem examination of a 20 year old cob stallion euthanased following severe colic revealed caecal impaction and perforation.

A four year old Thoroughbred mare who died suddenly was found to have a marked abdominal haemorrhagic effusion. Abdominal haemorrhage was thought to have originated from rupture of veins in the ascending mesocolon, and death subsequent to cardiovascular compromise. No predisposing causes for the venous rupture were identified. The horse had concurrent cyathostomiasis.

Two cases of death subsequent to grass sickness were reported this quarter. Single cases of gastric rupture, intestinal rupture, intestinal volvulus, acute cardiac failure, splenic lymphoma, multiple pelvic fractures, and *Rhodococcus* associated osteomyelitis, respectively, were reported.

No cause of illness was determined for a 12 year old cob gelding which showed severe neurological signs with seizure activity and recumbency prior to euthanasia.

Cause of death in the 23rd case examined this quarter was not able to be determined.

Home Counties

Fourteen cases were examined this quarter.

Two neurological cases were reported including a case each of spinal compression and *Sarcocystis neurona* infection.

Four animals which presented with colic signs were examined post-mortem. In two of these cases a pedunculated lipoma was found.

Two respiratory cases were examined post mortem including an animal with COPD and another with aspiration pneumonia.

Additional cases consisted of bacterial endocarditis, multiple distal limb fracture, an animal with multiple cysts of *Echinococcus equi*, a calcite cystolite of 16 kg, renal failure and a case of glomerular cystic disease.



South West

Ten cases were examined during this quarter.

The cases examined post-mortem included a ruptured duodenal ulcer, foal diarrhoea, mild enterocolitis with vacuolar hepatopathy, two large colon torsions (and additional rupture in one case), a case of strangles, grass sickness, a melanoma which eroded the pulmonary artery and bled into the pericardium and two cases without diagnosis.

West Midlands

One case was examined post-mortem during this quarter.

Post mortem examination of an animal with colic and peritonitis revealed necrotic gut with a mesenteric thrombus.

Scotland

Twenty cases for post-mortem examination and biopsies from 25 equids were submitted this quarter.

A five month old Clydesdale colt was presented having been referred to the veterinary hospital with a 1-2 day history of non-specific poor demeanour, progressing to dullness, anorexia, tachycardia and recumbency. The animal was dead on arrival at the hospital. The abdominal cavity contained large amounts of liquid food material with a marked fibrinous peritonitis, and large numbers of adult ascarid parasites (*Parascaris equorum*) free within the abdomen and bound within the fibrinous reaction. A rupture of the proximal jejunum was identified, and numerous ascarid parasites were present within the small intestine and caecum.

A five year old cob cross mare was submitted for post-mortem examination following euthanasia due to signs suggestive of equine dysautonomia (grass sickness). In addition endoscopic examination had identified an ulcerative lesion on the caudal aspect of the soft palate (dorsal surface). Equine dysautonomia was confirmed by gross and histological examination. The dorsal aspect of the soft palate contained a soft, friable, grey to red, 3cm x 8cm ulcerated area, with irregular borders. Histologically the ulcerated area was covered by fibrin and necrotic cell debris, with granulation tissue formation, vascular thrombi, and areas of mineralisation. The aetiology of the palatal ulceration was not determined.

A twenty year old Icelandic mare was presented for necropsy examination following sudden death at pasture. The mare was the third horse in a group of five to die in two days. The group had been moved to a new field ten days previously, ragwort was noted on the pasture; no other toxic plants were identified. At necropsy the liver was diffusely firm, orange /tan, with myriad coalescing tan nodules measuring up to 5mm in diameter, which replaced the parenchyma. Histologically the hepatic architecture was distorted by anastomosing trabeculae of fibrous tissue, which extended around nodules of hepatic regeneration and bridged between portal regions. Megalocytes and binucleate hepatocytes were noted. The findings were considered to be consistent with hepatic cirrhosis, most likely due to pyrrolizidine alkaloid toxicity. The two horses which had died previously were not submitted for necropsy examination. The remaining two horses were subsequently euthanased with clinical signs and biochemical parameters suggesting hepatic failure, and the same disease process is suspected to have occurred in all animals.



An aged Arab mare was presented for necropsy having been found dead in the field, with no previous clinical signs. The pelvis was fractured in multiple places, with numerous bone fragments embedded within the surrounding musculature. The major lesions were a complete fracture of the pelvic symphysis, complete fractures of the right pubis and ilium above and below the acetabulum, and fracture of the fused sacral bones. Large amounts of partially clotted blood were present between the muscles of the medial thigh regions, and dissecting between the musculature of the right abdomen and thorax. The abdominal and thoracic viscera were unremarkable. Death was considered to be due to haemorrhagic shock following pelvic fracture. The reason for the fracture remains unknown.

A five year old Friesian gelding was presented following a two day history of pyrexia which progressed to marked tachycardia, acidosis and death. The abdominal cavity contained large amounts of red/brown fluid with clumps of fibrinous and purulent material. Peritoneal surfaces were coated with fibrin, and intestinal loops were loosely adhered to each other. A 10-15 cm long defect was present within the gastric wall, which communicated with a cavity, formed by the omentum, and containing well masticated food material. Histologically there was a severe peritonitis, gastric mucosal necrosis, ulceration and haemorrhage, and gastric submucosal and muscular haemorrhage. The cause of the gastric perforation remains unknown.

No gross or histological lesions could be found in a Welsh Mountain pony which became recumbent and unresponsive.

Additional necropsy cases included laminitis (n=2), grass sickness (acute n=2, and chronic n=1), acute enteritis (n=1), chronic renal failure (n=1), bone cyst in mandible (n=1), and one case of chronic weight loss in which no diagnosis has yet been reached.

There were five additional gastrointestinal cases including mesenteric tear with colonic pelvic flexure entrapment and a secondary rectal tear, caecal rupture, strangulating lipoma, intestinal volvulus and umbilical hernia.

The neuromuscular disease laboratory received muscle biopsies from eight horses. There were two diagnoses of Equine polysaccharide storage myopathy, one diagnosis of Equine motor neuron disease, and one diagnosis of denervation atrophy. In the remaining four samples three were considered to have no significant pathology, and in one case the diagnosis was recorded as open.

Twenty two biopsy submissions from seventeen horses were examined. Mandibular osteoma was diagnosed in a fifteen year old, thoroughbred cross mare. Botryomycosis was diagnosed in a seven year old thoroughbred mare, adjacent to the horizontal ramus of the mandible. A diagnosis of mammary fibrolipoma was made in a fourteen year old hunter type mare, and an intraosseous epidermoid cyst was identified within tissue removed from the pedal bone of a six year old thoroughbred gelding. Other diagnoses included sarcoids (n=2), testicular hypoplasia in a six year old cryptorchid Shetland stallion, and eosinophilic enteritis (n=1). No details were reported from the remaining nine cases.



Northern Ireland

Fifteen post-mortem cases were examined during this quarter.

Significant cases included a foetus aborted at six month gestation. The foetus was partly mummified. Immunofluorescence for *Leptospira* was positive in foetal lung, kidney and adrenal. No other significant organisms were detected.

An abscess in the urachus with histological evidence of septicaemic spread to the lungs was seen in a six-week-old foal. The foal had been ill for three days before death. *Staphylococcus aureus* was isolated from the abscess.

Significant numbers of *Strongyloides* worms were detected on post-mortem examination of three foals, aged three, four and twelve weeks, from two separate premises. A ten-day-old donkey foal was found to have 180'000 *Strongyloides* worms at post-mortem examination.

Clostridium difficile toxin was detected in the small intestine of a six-month-old foal that died after sudden onset colic and diarrhoea. On post-mortem examination gas and watery contents were seen in the intestines.

Abdominal haemorrhage from a ruptured vena cava was seen on post-mortem examination of a three-week-old foal. Bruising was present in the shoulder muscles and there was haemorrhage in the right shoulder joint. Trauma was suspected.

A four-year-old gelding was euthanized after being found in lateral recumbency. Haemorrhage was present in the distal cervical proximal thoracic region of the spinal canal. Trauma was suspected.

A four-year-old stallion was found dead. The carcass was severely autolysed. Cyathostome and *Oxyuris equi* worms were present in the large intestine.

An eighteen-year-old mare died within twelve hours of being found bleeding from the rectum. On post-mortem examination there was distension of the colon at the diaphragmatic flexure with thinning of the colonic wall around a 3cm diameter firm nodule. Multiple black nodules 1-2cm in diameter were present in the skin of the perineum and the liver. The spleen was enlarged with multiple black nodules, up to 6cm in diameter, scattered throughout the parenchyma. A metastatic melanoma with colonic haemorrhage was diagnosed.

Acute traumatic skull fracture with haemorrhage was seen in a four-year-old gelding that had died suddenly. On post-mortem examination there was oedema in the soft tissues caudal to the guttural pouches and in the cranial neck. The right guttural pouch was distended with clotted blood and there was haemorrhage into the soft tissue between the guttural pouches. The medial wall of the right guttural pouch was torn dorsally. The torn wall was associated with fragments of the fractured body of the basisphenoid bone which had been avulsed ventrally. Spicules of bone extended dorsally into the floor of the cranial vault and were associated with haemorrhage around the pituitary gland.

On post-mortem examination of a ten-year-old mare a large abscess, containing over five litres of blood-stained pus was seen in the dorsal aspect of the left gluteal muscles



extending from the left tuber coxae to the ischial tuberosity. Subcutaneous oedema extended for the left gluteal region to the coronary band of the left hindleg.

A six-year-old mare was euthanized when it failed to respond to treatment for colic. On post-mortem examination the colon and caecum were impacted with coarse, fibrous ingesta.

A twelve-year-old mare that had died suddenly was autolysed at post-mortem examination. There was a blood-filled space, approximately 15cm by 10cm, in the right cranial lung. Pulmonary haemorrhage was suspected.



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JSC Equine Laboratory
Liphook Equine Hospital
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**We would welcome feedback including contributions on focus articles
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