Highlights in this issue:

- Focus Article - Getah Virus

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.
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Introduction

Welcome to the second quarterly equine disease surveillance report for 2016 produced by Department for Food, Environment and Rural Affairs (Defra), British Equine Veterinary Association (BEVA), Animal & Plant Health Agency (APHA) and the Animal Health Trust (AHT).

The national disease data is collated through multiple diagnostic laboratories and veterinary practices throughout the United Kingdom, providing a more focused insight to the prevalence of equine infectious disease. Due to the global mixing of the equine population through international trade and travel, collaboration on infectious disease surveillance between countries occurs on a frequent basis to inform and alert. Both national and international information will be summarised within this report.

Current national and international disease outbreaks from 1st July 2016

National disease occurrence

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

On 6th July 2016, the Animal Health Trust, Newmarket confirmed a case of EHV-1 early abortion (approximately 117 days) on a Thoroughbred stud farm in Berkshire, England. The positive diagnosis was confirmed by qPCR on fetal tissues. To date, no further cases on these premises have been reported.

International disease occurrence

ANTHRAX

Sweden

On 27th July 2016, the National Veterinary Institute, Sweden, reported a single case of anthrax on premises in Omberg, Östergötland. Eight cattle were also found dead on pasture within a few kilometers of these premises. For seven of these cases, anthrax has also been the confirmed aetiology. Control measures have been implemented and no further cases have been reported to date.

EQUINE INFECTIOUS ANAEMIA (EIA)

Slovakia

On 28th July 2016, the World Organisation for Animal Health (OIE) reported a case of EIA on premises in Nitra, Slovakia. This is the first occurrence of EIA within Slovakia.

EQUINE INFLUENZA (EI)

Germany

On 12th August 2016, a single case of EI was confirmed on premises in Lower Saxony, Germany. No further details are currently available.

Further details on the above outbreaks can be found at http://www.aht.org.uk/cms-display/international-breeders-meeting.html
DEFRA BUSINESS

Following the Government’s decision to maintain notifiable status for Contagious Equine Metritis (CEM) and Equine Viral Arteritis (EVA) it is accepted that the equine industry will take over the management and costs of future CEM and EVA outbreaks.

The Chief Veterinary Officer (CVO) directed that a suitable plan, satisfactory to Defra and the UK equine industry is formulated on the basis that:

1. The Horserace Betting Levy Board (HBLB) Codes of Practice are the standards for diagnosis, management, treatment and confirmation of freedom of disease.

2. Satisfactory compliance with HBLB Codes of Practice governs whether Defra needs to apply statutory movement restrictions on the premises or not.

3. The AHT Epidemiology and Disease Surveillance Unit will be responsible for investigating diagnosed outbreaks through to confirmation of freedom of disease. The process will use attending certified Equine Official Veterinarians (OVs) or, if requested or deemed necessary, co-opted Equine OV’s with appropriate experience and expertise.

4. Defra’s Equine OV certification system will be updated to include appropriate skill sets where necessary.

The fine details of the plan remain in discussion in order to satisfy the health and welfare needs of UK’s horses, the continuing statutory needs of Defra and the needs of the equine industry.

HBLB Codes of Practice update

The HBLB, in conjunction with the National Trainers Federation have recently launched a mobile app, EquiBioSafe. This brings together the Codes of Practice relating to breeding operations and training yards to provide advice on prevention and control of a range of equine infectious diseases. However, this can also be extended to the general equine population. The infectious diseases covered include CEM, EVA, Equine Herpes Virus (EHV), Equine Coital Exanthema (ECE), Equine Infectious Anaemia (EIA) and Dourine. Additional guidelines are also provided on *Streptococcus equi* and artificial insemination.

EquiBioSafe is free to download on Android and iOS mobile apps. The hard copy publication of the HBLB Codes of Practice has ceased, however will continue to be available at [http://codes.hblb.org.uk/](http://codes.hblb.org.uk/)
FOCUS ARTICLE

In this report we are pleased to include a focus article written by Peter Timoney, MVB (Hons), MS, PhD, FRCVS from the Gluck Equine Research Center, University of Kentucky, Lexington, Kentucky, USA on Getah Virus. We reiterate that the views expressed in this focus article are the author’s own and should not be interpreted as official statements of APHA, BEVA or the AHT.


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/cms-display/equine_disease_registration.html
The results of virological testing for April to June 2016 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 Animal & Plant Health Agency (APHA), Weybridge. The sample population for the APHA is different from that for the other contributing laboratories, as the APHA’s tests are principally in relation to international trade (EVA and EIA). APHA now provides testing for WNV as part of clinical work up of neurological cases on specific request and provided the local regional APHA office has been informed.

Table 1: Diagnostic virology sample throughput and positive results for the second quarter of 2016

<table>
<thead>
<tr>
<th></th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Serological Tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVA ELISA</td>
<td>1939</td>
<td>62*</td>
<td>5</td>
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<tr>
<td>EVA VN</td>
<td>655</td>
<td>136*</td>
<td>3</td>
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<tr>
<td>APHA EVA VN</td>
<td>229</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>EHV-1/-4 CF test</td>
<td>684</td>
<td>9*</td>
<td>3</td>
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<tr>
<td>EHV-3 VN test</td>
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<td>2</td>
<td>1</td>
</tr>
<tr>
<td>EHV-A/-B CF test</td>
<td>186</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza HI test</td>
<td>98</td>
<td>0*</td>
<td>2</td>
</tr>
<tr>
<td>EIA (Coggins)</td>
<td>240</td>
<td>0</td>
<td>3</td>
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<tr>
<td>EIA ELISA</td>
<td>1148</td>
<td>5†</td>
<td>5</td>
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<tr>
<td>APHA EIA (Coggins)</td>
<td>501</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA WNV (cELISA)</td>
<td>33</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Virus Detection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EHV-1/-4 PCR</td>
<td>565</td>
<td>35</td>
<td>5</td>
</tr>
<tr>
<td>EHV-2/-5 PCR</td>
<td>40</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>EHV-3 virus isolation</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Influenza NP ELISA</td>
<td>7</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza Directigen</td>
<td>16</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza PCR</td>
<td>178</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>APHA Influenza PCR</td>
<td>16</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza VI in eggs</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>EHV VI</td>
<td>82</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>EVA VI/PCR</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AHVLA EVA VI/PCR</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>95</td>
<td>24</td>
<td>7</td>
</tr>
</tbody>
</table>

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 ** = Seropositive due to vaccination, 1= inconclusive on ELISA, confirmed negative by Coggins
EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

On 5th April 2016, the Animal Health Trust reported a further case of EHV-1 abortion on a Thoroughbred stud farm in Hertfordshire. The affected animal was a vaccinated mare, already in isolation, due to direct contact with the eight previously confirmed cases on the premises. Appropriate biosecurity measures, in accordance with HBLB Codes of Practice, had already been implemented and were continued as necessary. Beaufort Cottage Laboratories confirmed the positive diagnoses through post mortem examination and PCR on placental and fetal tissues.

On 18th April 2016, the Animal Health Trust, Newmarket confirmed a further case of EHV-1 on a Thoroughbred stud farm in West Sussex, epidemiologically linked to the index case and secondary case reported on 24th March and 27th March 2016. The affected animal was vaccinated and aborted whilst in isolation. Appropriate biosecurity measures have already been implemented in accordance with the HBLB Codes of Practice and will continue as required. The positive diagnosis was confirmed by gross pathology and PCR on placental and fetal tissues.

On 6th May 2016, the Animal Health Trust confirmed a case of EHV-1 abortion on a stud premises in Shropshire. The affected animal was vaccinated and aborted whilst stabled. Prior to abortion, this animal was in contact with three other vaccinated mares. The positive diagnosis was confirmed by PCR on fetal and placental tissues. No further cases have since been reported.

EQUINE HERPES VIRUS-1 (EHV-1) NEUROLOGICAL DISEASE

On 5th May 2016, the Animal Health Trust reported a suspected case of EHV-1 neurological disease on a Thoroughbred racing yard in Surrey. The affected animal is a four-year-old Thoroughbred filly that presented with neurological signs in mid-April 2016. A nasopharyngeal swab taken after development of neurological signs was negative for EHV-1 by quantitative PCR (qPCR) and a serum sample demonstrated only low levels of antibody detected by complement fixation test (CFT) – neither of which were considered consistent at that time with a confirmed diagnosis of EHV-1 neurological disease. On further sampling, a positive diagnosis for EHV-4 infection was confirmed by qPCR on a nasopharyngeal swab, with a corresponding seroconversion to EHV using CFT. Five direct, asymptomatic in-contacts were placed into isolation and were clinically and virologically monitored. On 4th May, positive diagnoses of EHV-1 were confirmed by qPCR on nasopharyngeal swabs from three in-contacts. As a result, although EHV-1 has not been isolated from the affected animal, quarantine measures have been implemented throughout the premises. This outbreak was closely monitored and no further cases were reported.

EQUINE HERPES VIRUS-1 (EHV-1) RESPIRATORY DISEASE

On 5th May 2016, the Animal Health Trust reported two cases of EHV-1 respiratory disease in two-day-old and five-day-old foals on a Thoroughbred stud in Suffolk, which had previously reported a confirmed case of EHV-1 neonatal mortality in February 2016. The positive diagnoses were initially confirmed by qPCR on nasopharyngeal swabs taken from both foals on 3rd May 2016 and on post mortem material taken on 5th May 2016 following humane euthanasia of the younger foal.
Appropriate biosecurity measures, again were implemented in accordance with the HBLB Codes of Practice and were continued as necessary.

On 1st June 2016, the Animal Health Trust reported two cases of EHV-1 respiratory disease in a two-day-old foal and mare on premises in Kent. The positive diagnoses were confirmed by qPCR on foal tissues, following humane euthanasia of the foal and a nasopharyngeal swab from the mare. EHV-1 DNA was detected at high levels in foal tissues, and at low levels in the nasopharyngeal swab. Biosecurity measures were implemented, that included further serological monitoring. These were continued as necessary.

**EQUINE INFLUENZA (EI)**

On 16th June 2016, the Animal Health Trust confirmed two cases of EI on premises in Hampshire, England. The affected animals were a non-vaccinated Cob gelding and a non-vaccinated Irish Sports Horse gelding that had arrived on the premises approximately one week previously from overseas. The presenting clinical signs included frequent coughing, serous nasal discharge and pyrexia. The cases were in direct contact with four other animals of unknown vaccination status in the same field, although none of them have been reported to have shown clinical signs of disease. The positive diagnoses were made by qPCR on nasopharyngeal swabs.

On 23rd June 2016, the Animal Health Trust confirmed one case of EI on premises in Kent, England. The affected animal was a non-vaccinated Irish Sports Horse gelding that had arrived on the premises approximately one week previously from overseas. The presenting clinical signs included coughing, nasal discharge and pyrexia. The case was in direct contact with three other horses, of which one was not vaccinated. None of the direct contacts have been reported to have shown clinical signs of disease. The positive diagnosis was made by qPCR on a nasopharyngeal swab.

For all of the above confirmed cases, the strains identified were from the Florida clade 2 sub-lineage.

In the case of an outbreak, notification will be reported by the text alert service (Tell-Tail) for UK equine practitioners sponsored by Merial Animal Health. This free of charge service alerts practitioners to outbreaks of equine influenza in the UK via text message. Equine veterinary practitioners can sign up for this scheme by registering at the following website [http://www.merial.co.uk](http://www.merial.co.uk). This service has also been offered to the members of the National Trainers Federation (NTF).

If you would like more information regarding outbreaks of equine influenza virus or would like to sign up for our sentinel practice scheme, please contact: equiflunet@aht.org.uk or follow the link to [www.equiflunet.org.uk](http://www.equiflunet.org.uk) for more information on equine influenza.
AFRICAN HORSE SICKNESS

SOUTH AFRICA
Further to the update provided in the first quarter 2016, the most recent case was confirmed in May. With a time period of 40 days since this last confirmed case, the containment zone around Wellington, Paarl and Stellenbosch has been dissolved and movement controls within the AHS Surveillance Zone reverted to the normal protocol as from 13th June, the details of which can be found at www.elsenburg.com.

Vaccination within the surveillance and free zones is only allowed from 13th June until 31st October 2016 and only with permission from a state veterinarian. A map of the AHS control zones can also be found at www.elsenburg.com/vetepi.

EASTERN EQUINE ENCEPHALOMYELITIS (EEE)

USA
Twelve cases of EEE were confirmed in the USA during the second quarter of 2016, of which seven occurred in Florida, four in South Carolina and one in Virginia. None of the cases were vaccinated and all were euthanased post development of clinical signs.

EQUINE HERPES VIRUS-1 (EHV-1)

REPUBLIC OF IRELAND
Four cases of EHV-1 infection were reported during the second quarter of 2016 from County Tipperary (two cases in May), County Wexford (one case in June) and County Offaly (one case in June). No clinical descriptions were available of the syndrome involved.

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

BELGIUM
Two separate cases of EHV-1 abortion have been reported. The affected animals were not vaccinated. The positive diagnoses were confirmed by PCR on fetal tissues.

FRANCE
Two outbreaks were confirmed in Côtes d’Armor and Manche, including one in an Anglo-Arab mare. Positive diagnoses were confirmed by PCR on fetal tissues.

JAPAN
Three separate cases of EHV-1 abortion occurred during April and May in Thoroughbred animals. All animals were vaccinated. The positive diagnoses were confirmed by PCR and the confirming laboratory was Hokkaido Hidaka Livestock Hygiene Service Centre.

SOUTH KOREA
On 18th May 2016, Quarantine & Inspection Agency (QIA) reported a case of EHV-1 abortion in Gangwondo, Korea. The affected miniature mare was unvaccinated. Appropriate biosecurity measures were implemented. The positive diagnosis was confirmed by gross pathology and PCR on placental and fetal tissues.
EQUINE HERPES VIRUS-1 (EHV-1) NEUROLOGICAL DISEASE

BELGIUM
Two separate outbreaks of EHV-1 neurological disease were reported in April. For one outbreak, the positive diagnosis was confirmed by PCR on blood, for the other, the positive diagnoses were confirmed by PCR on blood and nasopharyngeal swabs. For both outbreaks, quarantine procedures were implemented and no further cases have been reported.

FRANCE
Two separate outbreaks of EHV-1 neurological disease were reported in June. The positive diagnoses were confirmed by PCR on nasopharyngeal swabs.

USA
Eight separate outbreaks of EHV-1 neurological disease were reported during the second quarter 2016. The states with confirmed infection were Florida, Maryland, Nebraska, New York, New Mexico, Pennsylvania, Texas and Wisconsin. The Pennsylvania, Nebraska and New Mexico outbreaks occurred on racing premises. The outbreak in Texas occurred on a stud farm. Non-neuropathogenic and neuropathogenic strains of the virus were both involved.

EQUINE INFECTIOUS ANAEMIA (EIA)

CANADA
Between 1st April and 30th June 2016, there have been a total of 15 EIA positive equines reported in the provinces of British Columbia (one) and Saskatchewan (14). The positive animals were identified on five separate premises, British Columbia (one) and Saskatchewan (four).

Two of the affected Saskatchewan premises were epidemiologically linked and they accounted for 11 of that province’s 14 cases. They were also epidemiologically linked to the affected premises that had been identified in February 2016. The above cases were confirmed by positive AGID serology.

USA
A total of three EIA positive animals were reported. Two cases were identified on separate premises in Pennsylvania, and a single case on premises in Colorado. Quarantine restrictions were implemented, alongside outbreak investigation. No further cases have since been reported on these premises.

EQUINE INFLUENZA

USA
Equine influenza is endemic in the USA. During the second quarter of 2016, outbreaks were recorded in West Virginia, Ohio, Kentucky, New York, Illinois and Maine.

RABIES

USA
A case of rabies was diagnosed in a horse in Arizona that had been hospitalised and was unresponsive to treatment. This horse was subsequently euthanised.

WEST NILE VIRUS (WNV) - ENCEPHALITIS

USA
One case of WNV Encephalitis was recorded in Florida during the second quarter of 2016.
Title: Getah Virus- An infrequent cause of disease in horses  
Peter Timoney, MVB (Hons), MS, PhD, FRCVS from the Gluck Equine Research Center, University of Kentucky, Lexington, Kentucky, USA

**Introduction**

Following its original isolation in Malaysia in 1955, Getah virus was for many years regarded as non-pathogenic for vertebrates. It was not until late 1978 following an extensive outbreak of an acute non-fatal febrile disease among racehorses in Japan, that the pathogenicity of the virus was first established. Over the intervening years, Getah virus has been implicated very infrequently as causing disease in horses. The most recent reported occurrence in Japan in 2014 served as a reminder of its potential as an equine pathogen. With the exception of a widespread outbreak of clinical infection on a Thoroughbred breeding farm in India in 1990, other recorded outbreaks of this virus infection occurred in racehorses in Japan in 1978, 1979, 1983 and 2014. The first two reported outbreaks in Japan were in densely populated training stables and spread of infection extended over a 4 to 6 week period.

**Aetiology and Epidemiology**

Getah virus is a mosquito-borne arbovirus belonging to the genus *Alphavirus* family *Togaviridae*. Several subtypes of this RNA virus have been identified, including Sagiyama, Ross River and Bebaru viruses. These have been placed in a Getah virus subgroup. The current geographic distribution of Getah virus is known to extend throughout much of Asia, from Mongolia in the North to Australia in the South. Although serological studies suggest widespread exposure to the virus among vertebrates (mammals, birds and reptiles) including humans, clinical disease associated with natural infection has only been reported very infrequently in horses and uncommonly, in pigs. Disease in pigs appears at least in part to be age-related, insofar as it

---

**Virus Classification**: Genus: Alphavirus Family: Togaviridae Group: IV, positive single-stranded RNA

**Transmission**: Indirect, vector-borne

**Clinical signs**: Non-specific to include pyrexia, lymphopenia, serous nasal discharge, hind limb and scrotal oedema, lymphadenopathy, mild abdominal pain, mild icterus, urticarial rash

**Laboratory Diagnosis**: RT-PCR assay or virus isolation on nasal swabs, saliva and unclotted samples and/or paired serology

**Geographic Distribution**: Asia, extending to Mongolia in the North, to Australia in the South.

**Control**: Vaccination in enzootic regions, vector control programmes

**Zoonotic Risk**: None

**UK trade implications**: Not notifiable, therefore no restrictions
has only been observed in newborn piglets in which the infection is frequently fatal. Limited experimental studies in cattle demonstrated that calves inoculated with mouse brain-passaged Getah virus were susceptible to infection. Although remaining clinically normal after challenge, they had histological evidence of encephalitis when killed 17 days later. Natural infection in wildlife is believed to be subclinical.

In tropical areas of Asia endemic for the virus, pigs appear to be an important reservoir horses, maintaining the virus via a mosquito-pig-mosquito cycle. Pigs and perhaps other vertebrates including horses may play a role as amplifying hosts of Getah virus. Serological surveys of horses in Japan have confirmed widespread distribution of the virus in the country, with seropositivity rates up to 53% observed in older horses in the cooler regions of northern Japan. However, the incidence of clinical disease was much lower.

Mosquitoes belonging to the genera *Culex* and *Aedes* are the biological vectors and principal means of transmission of Getah virus to horses; *A. vexans nipponii* and *C. tritaeniorhynchus* proven competent vectors in Japan. However, since high levels of virus can be demonstrated in the nasal secretions of some experimentally infected horses, it is also possible that horse to horse transmission may occur through close contact during the acute phase of the infection. This would be consistent with the fact that virus transmission has been confirmed outside of the normal periods of seasonal activity of the mosquito vectors.

**Clinical Outcome**

The majority of cases of primary Getah virus infection in horses are subclinical. As already indicated, recorded outbreaks of disease are very infrequent, with variable morbidity rates and no associated mortality. The clinical syndrome produced by the virus is mild and self-limiting with no apparent sequelae. The combination of factors responsible for development of clinical disease in horses is presently unknown.

Outbreaks of clinical infection caused by Getah virus can be extensive. The incubation period in cases of experimental infection is 2 to 4 days. Illness is characterized by the development of fever which can be biphasic ranging from 38.5°C to 40°C and lasting for 1 to 4 days, anorexia, depression, lymphopenia, serous nasal discharge, hind limb oedema, stiff gait, enlargement of the submaxillary lymphatic glands, mild abdominal pain, mild icterus, scrotal oedema and an urticarial rash on various parts of the body especially the neck, shoulders and hind quarter.
Limb oedema and urticaria usually supervene several days after the onset of fever. Affected animals may exhibit some or all of the afore-mentioned clinical signs. The outbreak of Getah virus infection in India was characterized by fever, limb oedema and stiffness. None of the affected mares developed an urticarial rash. Recovery is uneventful and takes place within 7 to 14 days of onset of clinical signs. There is no evidence from the outbreak in India that the virus is abortigenic or that infection in the pregnant mare can result in teratological abnormalities in the foal. That notwithstanding, transplacental transmission of Getah virus occurs in experimentally inoculated pregnant mice, hamsters, guinea pigs and rabbits and both natural and experimental infection of pregnant sows can result in fetal death.

**Diagnosis**
In view of its clinical similarity to a range of other infectious and non-infectious diseases, laboratory confirmation of a provisional clinical diagnosis of Getah virus infection is indicated. Among the diseases with which it can be confused are equine viral arteritis, equine herpesvirus 1 and 4 infection, equine influenza, African horse sickness fever, equine encephalitis, equine infectious anemia, purpura haemorrhagica, and hoary alyssum (plant) toxicosis.

Laboratory diagnosis of Getah virus infection can be readily accomplished by virus detection in nasal swabs, unclotted (buffy coat) samples and saliva either by RT-PCR assay or virus isolation. Viremia has been shown to develop by day 3 in horses challenged by the intranasal route and lasts for 3 to 5 days. To maximize the chances of agent detection, it is best to collect specimens as early as possible after the onset of fever.

Infection can also be confirmed by serological examination of paired, acute and convalescent, sera. Serum neutralising antibodies are first detectable 5 to 6 days post infection, with titres peaking by 2 to 3 weeks and persisting for many months. The neutralisation test is the most specific test to differentiate Getah virus infection from that with other related alphaviruses.

**Prevention and Control**
The single most effective measure to prevent Getah virus infection is implementation of an annual vaccination program of horses in virus enzootic areas. Use of an inactivated vaccine has proved highly effective in controlling the disease.
Additionally, vector control programs should be implemented; these should include elimination or reduction of mosquito breeding sites and use of larvicides and adulticides. Horses should be housed from dusk to dawn to minimize the risk of exposure to virus-infected mosquitoes.

**Suggested Readings**


BACTERIOLOGY
disease report for the second quarter of 2016

A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories
is presented in Table 2. For CEM, 24 HBLB approved laboratories in the UK contributed data.

Table 2: Diagnostic bacteriology sample throughput and positive results for the
second quarter 2016

<table>
<thead>
<tr>
<th></th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEM (HBLB) PCR</td>
<td>1160</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>CEMO (HBLB)</td>
<td>4859</td>
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<td>24</td>
</tr>
<tr>
<td>CEMO (APHA)</td>
<td>742</td>
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<tr>
<td>Klebsiella pneumoniae culture</td>
<td>5221¹</td>
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<td>Klebsiella pneumoniae PCR</td>
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<tr>
<td>Pseudomonas aeruginosa PCR</td>
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<tr>
<td>Pseudomonas aeruginosa culture</td>
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<td>Strangles*culture</td>
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<td>Strangles ELISA²</td>
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</tr>
<tr>
<td>Salmonellosis</td>
<td>249</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>APHA Salmonellosis</td>
<td>17</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>MRSA</td>
<td>342</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>89</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Clostridium difficile (toxin by ELISA or munochromatography)</td>
<td>95</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Borrelia (by ELISA)</td>
<td>17</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Rhodococcus equi culture/PCR</td>
<td>59</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>APHA Burkholderia mallei (Glanders)</td>
<td>284</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Lawsonia intracellularis** culture/PCR</td>
<td>56</td>
<td>16</td>
<td>5</td>
</tr>
</tbody>
</table>

CEM = contagious equine metritis (Taylorella equigenitalis); HBLB = HBLB accredited laboratories; # = capsule type 1,2,5; APHA = APHA reference laboratory; *Streptococcus equi subsp. equi; MRSA = methicillin resistant Staphylococcus aureus. ** Lawsonia intracellularis identified using PCR applied to faeces or serum for Immunochromatographic assay. ¹ reproductive tract samples only; ² seropositivity may be attributed to disease exposure, vaccination, infection and carrier states.

APHA CEM data for the period April to June 2016

We are again pleased to include data relating to CEM testing from the APHA, in this quarterly report. The sample population for the APHA is different from that for the other contributing laboratories as the APHA tests are principally in relation to international trade and/or outbreak investigations.

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 seropositivity using a serological ELISA.

*Burkholderia mallei* (Glanders)

Glanders is a notifiable disease in the UK. The APHA laboratory test used for screening (pre-export testing) and diagnosis in live animals is the complement fixation (CF) test, which may occasionally produce low level positive reactions. These are followed up by an on-site official veterinary inquiry by the APHA, restrictions on the affected horse and repeat testing to clarify the health status of the horse.
**APHA Salmonella results**

Seventeen samples were submitted this quarter to the Animal and Plant Health Agency (APHA) and fifteen of these were positive for *Salmonella*. From the incidents involving strains typed by the APHA, the serovars/phagetypes reported were *S. Typhimurium* (8 samples; 5 DT1, 2 U323, and 1 RDNC), monophasic *Salmonella Typhimurium* 4,5,12:i:- DT193 (5 samples) and *S. Newport* (2 samples). Monophasic *Salmonella Typhimurium* DT193 and U323 are associated primarily with pigs and cattle, *S. Typhimurium* DT1 is likely to originate from wild birds and *S. Newport* is often associated with badgers. For more information from APHA about *Salmonella* in Great Britain, please see the 2014 *Salmonella* in livestock surveillance report:


**INTERNATIONAL BACTERIAL DISEASE OCCURRENCE**

**Time period: 1st April to 30th June 2016**

**GERMANY**

**CEM**

CEM was confirmed in 20 horses on 12 premises during the second quarter of 2016 including in, Icelandic horses (13 stallions and one mare), Warmblood (one stallion), Coldblood (one stallion), Friesian (one stallion), Andalusian (one stallion) and breed unknown (two mares). Positive diagnoses were made by PCR on genital swabs.
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 first quarter 2016

<table>
<thead>
<tr>
<th>Disease</th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass Sickness</td>
<td>40</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Hepatic toxicoses</td>
<td>73</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Atypical myopathy/ Seasonal pasture associated Myopathy</td>
<td>1</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

### Table 4: Diagnostic parasitology sample throughput and positive results for the second quarter 2016

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Endoparasites</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascarids</td>
<td>4393</td>
<td>112</td>
<td>17</td>
</tr>
<tr>
<td>Cyathostomes</td>
<td>1220</td>
<td>229</td>
<td>13</td>
</tr>
<tr>
<td>Dictyocaulus</td>
<td>186</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Strongyles</td>
<td>4504</td>
<td>1503</td>
<td>20</td>
</tr>
<tr>
<td>Tapeworms (ELISA based testing)</td>
<td>2566</td>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>Tapeworms (Faecal exam)</td>
<td>1139</td>
<td>111</td>
<td>11</td>
</tr>
<tr>
<td>Trichostrongylus</td>
<td>100</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Strongyloides</td>
<td>3891</td>
<td>123</td>
<td>13</td>
</tr>
<tr>
<td>Oxyuris equi</td>
<td>357</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Fasciola</td>
<td>347</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Coccidia</td>
<td>477</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Cryptosporidia</td>
<td>99</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>APHA Theileria equi (CFT)*</td>
<td>135</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (IFAT)**</td>
<td>127</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (cELISA)**</td>
<td>134</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (CFT)*</td>
<td>135</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (IFAT)**</td>
<td>127</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (cELISA)**</td>
<td>134</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Ectoparasites</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mites</td>
<td>300</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Lice</td>
<td>316</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Ringworm</td>
<td>321</td>
<td>76</td>
<td>15</td>
</tr>
<tr>
<td>Dermatophilus</td>
<td>139</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Candida</td>
<td>110</td>
<td>3</td>
<td>8</td>
</tr>
</tbody>
</table>

*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
(http://www.equinegrasssickness.co.uk/)

The nationwide EGS surveillance scheme was established in spring 2008 to facilitate the investigation of changes in geographical distribution and incidence of the disease in Great Britain. Data gathered by this scheme is collated in a strictly confidential database.

Please note that the Equine Grass Sickness Surveillance Scheme receives data from a wider population in comparison to the data presented in Table 3, alongside different diagnostic criteria being used.

A total of 40 cases of equine grass sickness (EGS) were reported during the second quarter of 2016 (April - June), of which 27.5% occurred during April (n=11), 37.5% in May (n=15) and 35% in June (n=14). Fifty percent of cases occurred in Scotland (n=19/38), 44.7% in England (n=17/38) and 5.3% (n=2/38) in Wales. Forty percent (n=16) of affected premises reported having a prior history of EGS cases.

The cases comprised 71.1% geldings/stallions (n=27/38) and 28.9% mares/fillies (n=11/38), with a median age of 7 years (range 1 – 27 years). Affected breeds were Cob/Cob cross (n=14), Welsh/Welsh cross (n=6), Native/Native cross (n=12) Warm-blooded horses (n=4) and other (n=2).

Fifty-five percent of cases were reported to have acute EGS (n=22), 15% were reported to have sub-acute EGS (n=6) and 30% of cases were diagnosed with chronic EGS (n=12), of which nine were reported to have survived to date. Diagnostic information was provided for all forty cases, of which the majority (77%, n=31) were diagnosed based on veterinary assessment of clinical signs alone. Six were diagnosed via post mortem examination and three cases underwent laparotomy with diagnostic confirmation obtained by histopathological examination of an ileal biopsy sample.

Atypical Myopathy/Seasonal pasture associated myopathy

Twenty fifteen and 2016 so far, have reported low numbers of Atypical Myopathy (AM) cases in the UK. In the first and second quarter of 2015, post-mortem examination was performed in six suspected cases in 2015, of which four were positive, whilst in the same period in 2016 only a single case has been submitted for post-mortem confirmation, which was negative. These data approximate with the number of cases reported to the AM surveillance scheme (AMAG), with 13 cases reported in spring 2015 and no cases reported in autumn 2015 and spring 2016. However, it is important to note that AM is not a notifiable disease and therefore reporting of cases is voluntary. This can result with a reduced estimate of true prevalence in the UK. In addition, confirmation of the disease does not necessarily rely on post-mortem examination for non-survivors. Clinicians commonly rely on clinical signs and serum creatinine kinase (CK) activity as a diagnostic tool however; those cases can only be determined as “high probability” rather than confirmed. The development of serological tests that allow a rapid detection of the toxic compound that has been linked to AM, methylenecyclopropylacetic acid (MCPA) is in the developmental process for diagnostic use and has already shown reliable results in trials. Further information will be made available in due course.
East Anglia

A total of 39 cases were examined including 12 aborted fetuses and fetal membranes.

Of the twelve aborted fetuses examined, placentitis was identified in two cases, EHV-1 in two cases, umbilical cord torsion in two cases, ischaemic necrosis of the cervical pole in three cases and a single case of focal funisitis and diffuse, mild amnionitis. The cause of abortion could not be determined in two cases.

Four cardiovascular cases were examined; two cases of hypovolaemic shock and intra-abdominal haemorrhage of which one case was due to rupture of the right uterine artery post foaling and the other due to venous haemorrhage, with an unknown exact location. A single case of a focal epidural haematoma causing left cerebral compression and a single case of marked necrosis within the ventricular myocardium with extensive mineralisation, fibrosis and associated renal nephropathy.

Seven cases of gastrointestinal disease were examined; four cases of equine grass sickness confirmed on histopathology, a single case of stomach rupture, a single case of duodenal rupture, a single case of jejunal abscessation and a single case of large colon impaction and associated peritonitis.

Four musculoskeletal cases were examined in which gross pathology identified a single case of an acute left ischial fracture with associated haemorrhage, a single case of bilateral proximal sesamoid bone fractures, a single case of severe laminitis and a single case of navicular bursitis.

Nine cases of neonatal mortality were examined; two cases of bronchopneumonia due to EHV-1 infection, a single cases of acute suppurative pneumonia, two cases of dystocia, a single case of congenital malformation, a single case of septicaemia, a single case of jejunal infarction. The cause of neonatal mortality could not be determined in a single case.

One neurological case was examined where cervical stenotic malformation (csm) was identified.

One welfare case was investigated, where a severe necrotizing skin condition was identified, involving the deep dermis, subcutis and underlying muscular tissue. Salmonella species were also cultured from faecal and biopsy samples.

A single case where the cause of death was undetermined.

Home Counties

A total of 18 cases were examined

One cardiovascular case was examined, identifying caudal vena cava rupture.

Five cases of gastrointestinal disease were examined that included two cases of strangulating lipoma, a single case of duodenal diverticuli, a single case of sand impaction within the large colon, and a single case of necrohaemorrhagic typhlocolitis.

Seven musculoskeletal cases were examined in which two fractures were identified – one comminuted fracture of T4 with osteonecrosis and haemorrhage and one skull fracture, two cases of diffuse muscular atrophy, a single case of osteoarthritis of the right coxofemoral joint, a single case of superficial digital flexor tendon rupture, and a single case of osteoarthritis of C5 and C6.
One case of **neonatal mortality**, associated with suppurative tenosynovitis and meningioencephalitis.

One **neurological** case was examined where csm was identified, with dynamic instability at C3 – C4.

Three **respiratory** disease cases were examined; one case of pulmonary haemorrhage and two cases of laryngeal muscle atrophy.

**Northern England**

*A total of 26 cases were examined*

A single case of an *aborted* fetus was examined, identifying EHV-1 infection.

Eight cases of **gastrointestinal** disease were investigated identifying two cases of gastric rupture, a single case of anterior enteritis, a single case of small intestinal rupture, three cases of entero-typhlocolitis and a single case of colonic volvulus.

Five **musculoskeletal** cases were examined in which fractures of the second and third cervical vertebrae were identified in a single case, a single case of severe diffuse fibrinous arthritis and tenosynovitis of the right tarsocrural joint, a single case of distal limb tendon laceration, a single case a post-anaesthetic myopathy, identifying extensive haemorrhage and necrosis of the right longissimus muscle and a single case of clostridial myositis.

A single case of **neonatal mortality** identifying a palatal defect.

Two cases of **neoplasia** were examined, identifying a single case of adenocarcinoma and a single case of musculoskeletal sarcoma.

Three cases of **neurological** disease were examined, which identified a single case of cauda equina syndrome, a single case of a cholesterol granuloma, where masses were found within the choroid plexus of the lateral ventricles and a single case of equine grass sickness.

Three **respiratory** disease cases were examined, which identified exercise induced pulmonary haemorrhage in all cases.

Three **welfare** cases were examined, of which two were emaciated and one had severe chronic laminitis.

**Scotland**

*A total of ten cases were examined*

Six cases of **gastrointestinal** disease were investigated identifying one case of gastric rupture and associated peritonitis, one case of liver disease and cyathostomiasis, two cases of strangulating lipoma, and two cases of grass sickness, confirmed by histopathology.

One **musculoskeletal** case was examined, with findings indicative of navicular syndrome.

One case of **neonatal** mortality was examined, with findings indicative of septicaemia.

One case of **neoplasia** was examined, identifying multicentric lymphosarcoma, with multiple enlarged peripheral and central lymph nodes.

One **welfare** case was examined, confirming emaciation and parasitism.
Southern England

A total of nine cases were examined

Five cases of gastrointestinal disease were investigated which identified two cases of equine grass sickness, two cases of gastric ulceration and a single case of liver disease.

Two musculoskeletal cases were examined, identifying marked osteoarthritis of both shoulder joints in one case, and chronic laminitis in the other case.

One case of neoplasia was examined, identifying a nodular sarcoid on the penile sheath.

One case of respiratory disease indicating right guttural pouch empyema with Streptococcus zooepidemicus and Streptococcus dysgalactiae isolated.

Northern Ireland

A total of six cases were examined, which included two aborted fetuses and fetal membranes

Of the two aborted fetuses examined, EHV – 1 was identified in one case. The cause of abortion was not determined in one case.

Three cases of neonatal mortality were examined; a single case of sepsis, where Streptococcus zooepidemicus was isolated from multiple organs, a single case of ectopic ureters and a single case of hepatopathy.

One case of neoplasia was examined, which identified a sarcoma, presenting as a solid, discrete mass attached to fat, posterior to the patella.
This report was compiled by the Animal Health Trust. We are extremely grateful to the following laboratories for contributing data for this report.

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 AHVLA, which acts as the reference laboratory. We would also like to acknowledge the contribution of the Horserace Betting Levy Board CEMO-scheme.

Agri-Food and Biosciences Institute of Northern Ireland
Animal Health Trust Diagnostic Laboratory
Animal and Plant Health Agency
Arundel Equine Hospital
Axiom Veterinary Laboratory
Biobest Laboratories
Bushy and Willesley (B & W) Equine Group Ltd.
CAPL LTD Laboratory
Capital Diagnostics, Scottish Agricultural College
Carmichael Torrance Diagnostic Services
Chine House Veterinary Hospital
Dechra Laboratories
Donkey Sanctuary
Donnington Grove Veterinary Group
Endell Veterinary Group Equine Hospital
Hampden Veterinary Hospital
IDEXX Laboratories
JSC Equine Laboratory
Lab Services Ltd
Liphook Equine Hospital
Minster Equine Veterinary Clinic
Newmarket Equine Hospital
Oakham Veterinary Hospital
Rossdales Laboratories
The Royal Veterinary College
Three Counties Equine Hospital
Torrance Diamond Diagnostic Services (TDDS)
University of Edinburgh
University of Liverpool
University of Glasgow
Valley Equine Hospital

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

The Animal Health Trust (AHT) is extremely grateful to the Horserace Betting Levy Board (HBLB), Racehorse Owners Association (ROA) and Thoroughbred Breeders’ Association (TBA) for their continued combined contribution to the AHT’s Equine Infectious Disease Service.

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

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