Highlights in this issue:

- Equine Herpes Virus-1 (EHV-1) activity in the UK
- Focus article: Equine Herpes Virus (EHV) - A Constant Threat

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 fourth quarterly equine disease surveillance report for 2015 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). 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

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

On 20th January 2016, the Animal Health Trust, Newmarket confirmed a case of EHV-1 on private premises in North Yorkshire, England. The unvaccinated mare of unknown breed aborted whilst stabled and was placed into isolation with appropriate biosecurity measures implemented. The positive diagnosis was confirmed by histopathology and PCR on placental and fetal tissues.

On 27th January 2016, the Animal Health Trust confirmed a case of EHV-1 neonatal mortality on premises in Surrey, England. The five year old vaccinated Thoroughbred mare foaled whilst stabled, with the foal subsequently euthanased. The mare was in contact with 15 pregnant Thoroughbred mares on the premises and no further abortions have currently been reported. The positive diagnosis was confirmed by PCR on placental tissues.

On 1st February 2016, the Animal Health Trust reported a case of EHV-1 abortion on a Thoroughbred stud farm in Hertfordshire. The affected horse was a vaccinated mare that aborted whilst stabled. Prior to abortion, the mare was in contact with ten other pregnant mares. Beaufort Cottage Laboratories confirmed the positive diagnosis by PCR and histopathology on placental and fetal tissues.

On 5th February 2016, the Animal Health Trust confirmed a case of EHV-1 abortion on a Thoroughbred stud farm in Norfolk. The affected horse was a vaccinated maiden mare that aborted whilst stabled. Prior to abortion, the mare was in contact with three other pregnant mares. The positive diagnosis was confirmed by PCR and histopathology on placental tissues.

On 16th February 2016, the Animal Health Trust confirmed a case of EHV-1 abortion on a stud farm in East Suffolk. The affected animal was a vaccinated Thoroughbred mare who aborted whilst stabled. The mare was in contact with one other Thoroughbred mare, which foaled successfully two weeks previously, and 25 Arab horses. The positive diagnosis was confirmed by PCR and histopathology on placental and fetal tissues.

On 16th February 2016, the Animal Health Trust reported a case of EHV-1 neonatal mortality on a Thoroughbred stud farm in Hertfordshire, epidemiologically linked to the case reported on 1st February 2016. Beaufort Cottage Laboratories confirmed the positive diagnosis by PCR and histopathology on placental and fetal tissues.
On 19th February 2016, the Animal Health Trust reported a case of EHV-1 abortion on a small, sport horse stud farm in Berkshire. The affected horse was a vaccinated mare and prior to abortion was in contact with vaccinated pregnant mares on the premises. Beaufort Cottage Laboratories confirmed the positive diagnosis by PCR and histopathology on placental and fetal tissues.

On 24th February 2016, the Animal Health Trust reported a case of EHV-1 abortion on a Thoroughbred stud farm in Hertfordshire. The affected horse was a vaccinated mare that aborted whilst stabled. Prior to abortion, the mare was in contact with seven other pregnant mares. Beaufort Cottage Laboratories confirmed the positive diagnosis through post mortem examination and PCR on fetal and placental tissue.

On 8th March 2016, the Animal Health Trust reported three further cases of EHV-1 abortion on a Thoroughbred stud farm in Hertfordshire, epidemiologically linked to the EHV-1 abortion reported on 24th February 2016. Beaufort Cottage Laboratories confirmed the positive diagnoses through post mortem examination and PCR on fetal and placental tissues. An important aspect to consider with this outbreak is that for one case, an EHV-1 positive diagnosis through PCR was only identified on placental tissue.

On 15th March 2016, the Animal Health Trust reported four further cases of EHV-1 abortion in vaccinated mares on a Thoroughbred stud farm in Hertfordshire. The four cases are epidemiologically linked, through direct contact, to the index case and secondary cases, reported on 24th February and 8th March 2016. The biosecurity measures in place prior to the outbreak and further implemented on identification of the index case, have resulted in all reported cases having been confined to the area placed under quarantine since the index case, indicated through both clinical and serological monitoring. Beaufort Cottage Laboratories confirmed the positive diagnoses through post mortem examination and PCR on fetal and placental tissues.

For all of the above outbreaks, biosecurity measures were implemented in accordance with the HBLB Codes of Practice and have been continued as required.

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

On 30th January 2016, the Animal Health Trust made a presumptive serological diagnosis of EHV-1 neurological disease on a Thoroughbred stud farm in Suffolk. The clinically affected horse was a four-year-old vaccinated maiden filly that had arrived at the stud on 20th January 2016, having been transported to the stud from overseas with three other animals on the same lorry. On arrival, prior to the development of clinical signs that included ataxia and bladder dysfunction, the horse was blood sampled and placed into isolation as per normal routine for new arrivals. One in-contact horse that was transported with the index case developed pyrexia and was clinically and virologically monitored in isolation. The positive diagnosis was confirmed by seroconversion on paired serology using the complement fixation (CF) test, although a nasopharyngeal swab taken at the time of development of neurological signs was negative for EHV-1 by PCR. Appropriate measures were implemented in accordance with the HBLB Codes of Practice and continued until a clear status was achieved.

EQUINE HERPES VIRUS 1 (EHV-1) RESPIRATORY DISEASE

On 17th February 2016, the Animal Health Trust confirmed a case of EHV-1 respiratory disease on premises in Devon. The horse presented with lethargy, pyrexia and a unilateral nasal discharge and the positive diagnosis was confirmed by PCR on a nasopharyngeal swab. Prior to the development
of clinical signs in the confirmed case, two other in-contact horses had shown similar signs of respiratory disease. A nasopharyngeal swab was taken from one in-contact horse, however this was negative for EHV-1 on PCR. Appropriate control measures have been implemented and this outbreak will be closely monitored.

**EQUINE INFLUENZA VIRUS (EI)**

On 18th November 2015, the Animal Health Trust confirmed a case of EI on premises in Staffordshire, England. The affected animal was a seven-year-old unvaccinated gelding, with a three day history of bilateral nasal discharge, swollen lymph nodes and mild pyrexia. No further cases have been reported within this region.

On 26th November 2015, the Animal Health Trust confirmed a further case of EI on premises in Cleveland, England. The affected animal was a four-year-old unvaccinated Irish Sport Horse mare that had arrived on the premises after being imported. Presenting signs were pyrexia, cough, mucopurulent nasal discharge and lethargy. The affected animal was placed into isolation. The premises contained approximately ninety horses, with no further cases reported.

On 11th December 2015, the Animal Health Trust confirmed two cases of EI on premises in Northamptonshire, England. The affected horses were unvaccinated Andalusians that had arrived on private premises after being imported from Spain. Presenting clinical signs were nasal discharge, coughing and pyrexia. Two further cases from in-contact unvaccinated animals, who presented with similar clinical signs were then confirmed on 14th December. Control measures have included the implementation of movement restrictions for these premises.

On 2nd March 2016, the Animal Health Trust confirmed a case of EI in Hampshire, England. The affected animal was a four-year-old unvaccinated gelding that had arrived on the premises five weeks previously. The presenting clinical signs were coughing, mucopurulent nasal discharge and lethargy. Prior to diagnosis, the case was in direct contact with five other animals, however none of which developed clinical signs of disease.

For all of the above outbreaks, positive diagnoses were made by qPCR on nasopharyngeal swabs.

The outbreaks have been 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.
International disease occurrence beginning 1Q 2016

Coxiella burnetii ABORTION

BELGIUM
On 23rd November 2015 a case of abortion due to infection with Coxie bella burnetii was reported by Equi Focus Point Belgium affecting a mare on premises in the Antwerp region. The mare aborted on 11th November 2015 and the positive diagnosis was made on 18th November by PCR on fetal lung and liver tissue samples.

DOURINE – TRYPANOSOMA EQUIPERDUM

BOTSWANA
On 15th February 2016, the World Organisation for Animal Health (OIE) reported a total of three cases of Dourine in the Central, Southern and Kgatleng districts of Botswana. One case presented with prepuce swelling and weight loss with routine surveillance identifying the two further cases. Eight susceptible horses have also been identified with possible routes of transmission thought to have occurred through contact at grazing and watering. Botswana National Veterinary Laboratory confirmed the positive diagnosis on 10th February 2016 through serology using the complement fixation (CF) test. Control measures implemented by the Ministry of Agriculture have included movement restrictions and continued surveillance. This has been the first outbreak of Dourine reported in Botswana and epidemiological investigations will continue and be reported as necessary.

EASTERN EQUINE ENCEPHALOMYELITIS (EEE)

USA
On 8th January 2016, a case of EEE was reported in Holmes County, Florida. This was the fourth case of the disease in Holmes County during 2015 and the 23rd in the state of Florida. This recent case had last been vaccinated against EEE in spring of 2015.

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

BELGIUM
Equi Focus Point, Belgium reported five unrelated cases of EHV-1 abortion. The first case was confirmed on 17th December 2015 on premises in the Ghent region, with a positive diagnosis made through cell culture on tissue samples. The second case was confirmed on 24th December 2015 on premises in the Lier region. The third and fourth cases were confirmed on 4th March 2016 and occurred on premises in Zottegem and Bree and the fifth case confirmed on 14th March on premises in the Zeldelgem region. Here, the positive diagnoses were confirmed by PCR on fetal tissues. For all four outbreaks, the affected animals were not vaccinated.

FRANCE
On 9th March and 14th March 2016, Réseau d’Epidémio-Surveillance en Pathologie Equine (RESPE) reported two separate cases of EHV-1 abortion on stud premises in Orne and Seine-Maritime regions. Positive diagnoses were confirmed by PCR on fetal tissues by LABEO-Frank Duncombe. No further details were made available.

IRELAND
On 25th January 2016, the Irish Equine Centre confirmed a case of EHV-1 abortion in County Cork. No further details have been made available.
ITALY
On 10th March 2016, the Italian Reference Centre for Equine Disease reported a case of EHV-1 abortion in Tuscania, Viterbo. The affected animal was not vaccinated and the positive diagnosis was confirmed on 4th March by PCR on fetal tissues.

For both outbreaks, the control measures implemented have included movement restrictions for the affected premises and appropriate biosecurity measures to limit disease transmission.

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

BELGIUM
On the 29th January 2016, Equi Focus Point, Belgium reported a case of EHV-1 neurological disease on premises in Courtrai, Belgium. The horse presented with paralysis on 20th January 2016 and was subsequently euthanased.

On the 29th February 2016, Equi Focus Point, Belgium reported an outbreak of EHV-1 neurological disease in the Habay la Neuve region, Belgium. Since being first identified on 24th February 2016, 26 horses have been affected, with varying clinical presentations. Three animals developed severe paralysis and have subsequently been euthanased. Two further horses have developed ataxia and several are pyrexic. Quarantine measures were, therefore, implemented on these premises and no further cases have since been reported.

For both outbreaks, the positive diagnoses were confirmed by PCR on nasopharyngeal swabs.

FRANCE
On 22nd January 2016, Réseau d’Épidémio-Surveillance en Pathologie Equine (RESPE) reported a case of EHV-1 neurological disease on premises in the Loir-et-Cher region. The affected animal was a seven-year-old saddlebred mare who presented with ataxia, pyrexia, nasal discharge and coughing. A positive diagnosis was confirmed by qPCR by LABEO-Frank Duncombe. Ten other animals have been reported to be affected but no further details were available.

ITALY
On 10th March 2016, the Italian Reference Centre for Equine Diseases reported four cases of EHV-1 neurological disease on premises in Rome. The four animals were not vaccinated. The positive diagnoses were confirmed on 23rd February 2016 by PCR on nasopharyngeal swabs, identifying the neuropathogenic strain of EHV-1.

USA
On 30th December 2015, an outbreak of EHV-1 neurological disease, caused by the neuropathogenic strain of the virus, was confirmed on premises in Bucks County, Pennsylvania, USA. A total of three horses were affected at the riding stables, of which all were euthanased. A secondary case was confirmed on 5th January 2016 and subsequently euthanased. Six tertiary cases were confirmed on 7th January 2016 and received treatment on the premises. On confirmation of this outbreak, the affected premises were placed under 21 day quarantine, to extend from the last clinical signs of illness in any of the remaining horses at the stable. The 38 other horses on the premises have remained clinically normal.

On 8th January 2016, a further outbreak of EHV-1 neurological disease was confirmed in California. This involved a draft cross gelding that exhibited neurological signs and has been confirmed positive for a non-neuropathogenic strain of EHV-1. The affected horse was placed into quarantine and no horses have left or entered the premises since last September. All exposed horses were closely monitored and no further cases have been reported.
On 3rd February 2016, an outbreak of EHV-1 neurological disease was confirmed at a private stable in DuPage County, Illinois, USA. Three further cases were confirmed over a three week time period, with the neuropathogenic strain implicated. The premises have been placed under 21 day quarantine, until further notice.

On 3rd February 2016, an outbreak of EHV-1 neurological disease was reported at Sunland Park Racetrack in New Mexico, where initially, 28 horses were confirmed positive for the neuropathogenic strain of EHV-1. Over a time period of one week, the total number of confirmed EHV-1 positive horses increased to 44, of which 42 were located across 17 different barns at the track, and two were located at an adjacent training facility. Five horses at the racetrack were euthanased during this outbreak. Quarantine procedures implemented have included movement restrictions, and currently, any horse that has been on the grounds of Sunland Park Racetrack training facility within the last 30 days, cannot enter a Kentucky track or other sanctioned training facilities.

On 8th February 2016, a further outbreak of EHV neurological disease was confirmed at Turf Paradise Racetrack in Arizona. Of three horses that had come from Sunland Racetrack in New Mexico, one developed neurological signs and was euthanased. Following necropsy examination, this horse was confirmed a case of EHV neurological disease. No further cases of neurological disease have been reported to date. The racetrack is under quarantine restrictions until further notice.

On 9th February 2016, a new outbreak of EHV neurological disease was confirmed at the University of Georgia College of Veterinary Medicine, Large Animal Teaching Hospital. On 31st January 2016, a horse was admitted presenting with signs of ataxia and nystagmus without any preceding signs of fever or respiratory disease. By the next day, the animal’s condition worsened and the horse was euthanased. A nasal swab was confirmed positive for EHV-1. As of 2nd February the CVM equine facilities were placed under quarantine.

On 11th February 2016, a case of EHV-1 neurological disease was confirmed in a 14 year old polo mare in Riverside County, California. The mare had to be euthanased on 7th February 2016. A non-neuropathogenic strain of EHV-1 was implicated. Due to the potential exposure risk to the 70 horses in the stabling area, these animals have been placed under quarantine restrictions until further notice.

On 2nd March 2016, an outbreak of EHV-1 neurological disease associated with a neuropathogenic strain of the virus was confirmed on a facility in Martin County, Florida. The index case was placed into isolation and quarantine imposed on movement of horses onto and off the facility. The horse had travelled from Virginia with a number of other horses that were left off in South Carolina. Respective premises in both states have been placed under quarantine until further notice.

EQUINE HERPES VIRUS 1 (EHV-1) RESPIRATORY DISEASE

USA
On 18th February 2016, a case of EHV-1 respiratory disease was diagnosed in an aged Quarterhorse mare on premises in Chemung County, New York. A non-neuropathogenic strain of virus was involved. The mare and other horses on the farm were placed under quarantine and appropriate biosecurity measures were implemented.

On 24th February 2016, two cases of EHV-1 confirmed respiratory disease were reported at a stable in El Paso County, Texas. Both affected animals were febrile and had a nasal discharge. Neither horse was reported to have developed neurological signs.
FRANCE
On 1st February 2016, Réseau d’Épidémio-Surveillance en Pathologie Equine (RESPE) reported a case of EHV-1 respiratory disease in a nine-year-old mare on premises in Saône-et-Loire. Positive diagnosis was confirmed by PCR on a nasopharyngeal swab by LABEO-Frank Duncombe. No further details are currently available.

On 5th February 2016, Réseau d’Épidémio-Surveillance en Pathologie Equine (RESPE) confirmed a case of EHV-1 respiratory disease on premises in Loir et Cher, epidemiologically linked to the EHV-1 neurological disease outbreak reported on 22nd January 2016. Positive diagnosis was confirmed by qPCR on blood by LABEO-Frank Duncombe. Ten other horses were reported to be affected.

LEPTOSPIROSIS ABORTION
FRANCE
On 23rd December 2015 Réseau d’Épidémio-Surveillance en Pathologie Equine (RESPE) confirmed a case of leptospirosis abortion in the Manche region, France. Positive diagnosis was confirmed by PCR on tissue samples.

VESICULAR STomatitis
USA
As of 10th February 2016, the latest USDA VS Situation Report reports the number of virus confirmed premises, since the start of the current disease event, at 329, with an additional 494 premises on which the disease was clinically reported but not virologically confirmed. The eight affected states are Arizona, Colorado, Nebraska, New Mexico, South Dakota, Texas, Utah and Wyoming, with Colorado seeing the greatest proportion of cases (441). All virologically confirmed cases of VS have been caused by the New Jersey serotype.

WEST nILE VIRus (WnV)
TUNISIA
On 23rd November 2015, the Ministry of Agriculture, Tunis reported a single clinical case of West Nile virus infection in a horse near Degache, Western Tunisia, to the World Organisation for Animal Health (OIE). Measures undertaken in response to the outbreak included enhanced surveillance, movement and vector control.

USA
As of 5th January 2016, respective totals of WNV by state are as follows: Texas (38), Washington (18), Colorado (11), Kentucky (eight), with single cases in New Jersey, Mexico, Nevada and Oklahoma. The national total of cases in the USA currently stands at 81. The vast majority of affected animals have not been vaccinated against the disease.

RABIES
USA
On 18th January 2016, a case of rabies was confirmed in a horse in York County, South Carolina. The vaccination status of the horse was unknown.

On 9th March 2016, a further case of rabies was confirmed in a horse on premises in Madison County, Florida. The horse had not been vaccinated against the disease. The one remaining horse on the property has been placed under quarantine.
EQUINE INFECTIONS ANAEMIA (EIA)

GREECE
On 9th March 2016, the World Organisation for Animal Health (OIE) reported a sub clinical case of EIA in Kastoria, Western Macedonia, Greece. The National Laboratory, Veterinary Centre of Athens confirmed the positive diagnosis though a Coggins test on serum on 3rd February 2016. Control measures implemented have included movement restrictions and tracing of animals. This is the first outbreak of EIA in Greece and has been reported as resolved.

USA
On 10th February 2016, a case of EIA was confirmed on premises in Okeechobee County, Florida. Quarantine procedures were implemented with epidemiological investigations initiated.

On 10th March, an outbreak of EIA has been confirmed on a farm in Cortland County, New York. Five horses are involved with a total of 10 draft and buggy horses residing on the farm. Quarantine restrictions have been placed on the premises and investigation into the outbreak is ongoing.

DEFRA business

Tri-Partite Agreement (TPA) update
The Chief Veterinary Officers and the approved TPA bodies of the three signatory countries are meeting at the BEF HQ in Stoneleigh Park at the end of March to discuss options for the auditing of compliance with the new TPA arrangements.

Update on Central Equine Database
The Government procurement procedure is now underway to appoint the supplier of the database and results are expected shortly.

Focus article

In this report we are pleased to include a focus article written by Camilla Strang, BVetMed MSc DIC MRCVS from the Animal Health Trust on Equine Herpes Virus (EHV) - A Constant Threat. 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 October to December 2015 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 fourth quarter of 2015

<table>
<thead>
<tr>
<th>Serological Tests</th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
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<tr>
<td>EVA ELISA</td>
<td>1517</td>
<td>26*</td>
<td>4</td>
</tr>
<tr>
<td>EVA VN</td>
<td>254</td>
<td>41*</td>
<td>4</td>
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<td>APHA EVA VN</td>
<td>1130</td>
<td>30*</td>
<td>1</td>
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<tr>
<td>EHV-1/-4 CF test</td>
<td>337</td>
<td>8*</td>
<td>3</td>
</tr>
<tr>
<td>EHV-3 VN test</td>
<td>17</td>
<td>3*</td>
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<td>ERV-A/-B CF test</td>
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<tr>
<td>Influenza HI test</td>
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<tr>
<td>EIA (Coggins)</td>
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<td>EIA ELISA</td>
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<td>APHA EIA (Coggins)</td>
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<td>APHA WNV (cELISA)</td>
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**Virus Detection**

<table>
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<td>EHV-1/-4 PCR</td>
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<td>EHV-2/-5 PCR</td>
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<td>Influenza NP ELISA</td>
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<td>APHA Influenza PCR</td>
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<td>Influenza VI in eggs</td>
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<tr>
<td>Rotavirus</td>
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</tbody>
</table>

ELISA = enzyme-linked immunosorbent assay, VN = virus neutralisation, VLA = Animal Health 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, # = Seropositive due to vaccination, 1 = negative by IgM capture ELISA (tested positive for WNV by total Ab detection cELISA). Official veterinary inquiry confirmed no clinical signs but a history of vaccination.
A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Table 2. For contagious equine metritis (CEM) 24 HBLB approved laboratories in the UK contributed data.

**Table 2: Diagnostic bacteriology sample throughput and positive results for the fourth quarter 2015**

<table>
<thead>
<tr>
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<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
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<tr>
<td>CEMO (HBLB)</td>
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<td>CEMO (APHA)</td>
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</tr>
<tr>
<td>Salmonellosis</td>
<td>313</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>APHA Salmonellosis</td>
<td>30</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>MRSA</td>
<td>254</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>71</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Clostridium difficile (toxin by ELISA or monochromatography)</td>
<td>95</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Borrelia (by ELISA)</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><em>Rhodococcus equi culture/PCR</em></td>
<td>123</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><em>Lawsonia intracellularis</em> <strong>culture/PCR</strong></td>
<td>107</td>
<td>28</td>
<td>6</td>
</tr>
</tbody>
</table>

CEMO = contagious equine metritis organism (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 Immunoperoxidasa monolayer (IPMA) and/or ELISA assay; 1 reproductive tract samples only; * seropositivity may be attributed to disease exposure, vaccination, infection and carrier states.

**APHA CEMO Data for the period October to December 2015**

We are again pleased to include data relating to CEM testing from the Animal & Plant Health Agency (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 seropositive using a serological ELISA.

**APHA Salmonella results**

Thirty samples were submitted this quarter to the Animal and Plant Health Agency (APHA) and twenty-eight of these were positive for *Salmonella*. From the incidents involving strains typed by the APHA, the serovars/phagetypes reported were *S. Typhimurium* (10 samples; 1 DT132, 5 DT193, 2 DT41, 1 U302 and 1 RDNC), *S. Agama* (3 samples), *S. Anatum* (3 samples), *S. Enteritidis* (3 samples);
2 PT9a and one isolate that has not been typed), S. Ank (2 samples), S. Montevideo (1 sample), S. Newport (1 sample) and a single incident of monophasic *Salmonella* Typhimurium S. 4,12:i:- DT193. S. Enteritidis PT9a is likely to be of duck origin, S. Typhimurium DT41, DT132 and S. Anatum are typically associated with wild birds. *Salmonella* Typhimurium U302 and DT193 (including the monophasic variant) are associated primarily with pigs, and S. Newport and S. Agama are often associated with badgers.

Within the equine population, Equine Herpes Virus (EHV) is considered a globally ubiquitous disease, with EHV 1 and 4 amongst the most frequent causes of respiratory disease. Previous prevalence estimates indicate the majority of mature horses will have been infected with EHV-1, EHV-4, or both during their lifetime. Beyond respiratory disease, EHV-1 is associated with both abortion and neurological disease, leading to major welfare and financial implications.

The predominant factor in this endemic state arises from the establishment of long-term latency within the host. Recrudescence can then occur during periods of stress, such as management changes or increased disease burden. Therefore, when considering risk factors in new outbreaks, one should include the increasing level of international travel and trade, leading to a constant global mixing of the equine population in potentially stressful conditions and, as a result, an increased risk of exposure to EHV.

Veterinary focus is, principally, aimed at halting transmission in an attempt to reduce morbidity and mortality. For this to be achieved successfully, epidemiological analyses, in conjunction with molecular diagnostic techniques, are paramount in identifying transmission links including index cases, super-spreaders and other potential sources (e.g. sub-clinical cases), allowing for early disease detection and appropriate control measures.

When presented with an abortion or neonatal foal death, samples should ideally always be submitted to an appropriate laboratory for EHV clearance (fresh tissues submitted for qPCR only) or full fetal death investigation. With the latter, Pathologists can then coordinate a multi-disciplinary investigation for EHV through gross post-mortem examination, histopathological examination and qPCR on liver, lung, spleen, adrenal gland and thymus from the fetus and the cervical star, body and both horns from the placenta. As atypical EHV-1 abortions may occur, wherein EHV-1 resides solely in the placenta, submission of placental tissue with or without the fetal tissue should be routine, as these cases may serve as a source of sustained transmission if missed.
Neurological cases may present following respiratory signs or as primary neurological only cases. Here, clinical signs may vary in severity from mild paresis to recumbency with incontinence. In suspected neurological cases, nasopharyngeal swabs and/or sera from the case, and/or in-contact animals, for qPCR and complement fixation (CF) testing are strongly advised, this can help to identify the current infectiousness and the extent of the recent infection spread within the outbreak population. Where applicable, post-mortem examination can also be an appropriate option to confirm a diagnosis of EHV-1 neurological disease where the above sampling methods are not feasible.

When submitting diagnostic samples, by providing a full history, including duration, clinical signs, vaccination status and premises details can aid interpretation of results and enables epidemiologists to tailor their advice on appropriate sample collection and outbreak management to the specific situation. This data can also provide information for identifying trends in disease surveillance, to enable prediction forecasts and recommendations for future outbreak prevention and control.

As a consequence of the endemic status of EHV, an importance must also be given to the placement of appropriate biosecurity protocols prior to the development of an outbreak. These preventative measures are outlined in the HBLB Codes of Practice and correct implementation will help to reduce exposure and rapid onward transmission amongst individuals, as the infectious period is not always easily identifiable.

Two recent, separate UK outbreaks of EHV-1 neurological disease and EHV-1 abortion have successfully demonstrated the importance of both general biosecurity and outbreak specific biosecurity alongside rapid laboratory diagnostics to minimise the risk of onward transmission.

Regarding the EHV-1 neurological outbreak, the index case arrived on the premises just preceding the development of clinical signs, suggestive of infection having been contracted or recrudescence prior to arrival. As routine, this premises had isolation protocols, including serological monitoring, already implemented for new arrivals. As a result, the case was identified, the direct in contacts monitored clinically and virologically and further transmission was prevented. When presented with the EHV-1 abortion outbreak, the premises had routine biosecurity measures already in place. This included separate epidemiological units, for example pregnant mares kept in small groups, separate from all other stock. These were further implemented on identification of the index case. Although further secondary cases have resulted - direct in contacts - this transmission chain has been confined to the area placed under quarantine since the index case, indicated through both clinical and serological monitoring.

Therefore to conclude, thorough biosecurity protocols on equine premises can be essential to outbreak control. This requires successful engagement within the veterinary profession and from the profession to owners and managers. If an understanding of the value of control and response measures is achieved, compliance will be improved, leading to a greater health of the horse population.
References
TOXIC AND PARASITIC
disease report for the fourth quarter of 2015

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 fourth quarter 2015

<table>
<thead>
<tr>
<th>Condition</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>13</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hepatic toxicoses</td>
<td>53</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>Atypical myopathy</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

* Includes contributing laboratories with no cases submitted

Table 4: Diagnostic parasitology sample throughput and positive results for the fourth quarter 2015

<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>Endoparasites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascarids</td>
<td>3167</td>
<td>51</td>
<td>16</td>
</tr>
<tr>
<td>Cyathostomes</td>
<td>834</td>
<td>158</td>
<td>10</td>
</tr>
<tr>
<td>Dictyocaulus</td>
<td>64</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Strongyles</td>
<td>3254</td>
<td>840</td>
<td>17</td>
</tr>
<tr>
<td>Tapeworms (ELISA based testing)</td>
<td>121</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Tapeworms (Faecal exam)</td>
<td>718</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Trichostrongylus</td>
<td>64</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Strongyloides</td>
<td>3082</td>
<td>67</td>
<td>14</td>
</tr>
<tr>
<td>Oxyuris equi</td>
<td>445</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Fasciola</td>
<td>179</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Coccidia</td>
<td>274</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Cryptosporidia</td>
<td>8</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>APHA Theileria equi (CFT)*</td>
<td>345</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (IFAT)***</td>
<td>350</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (cELISA)***</td>
<td>362</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (CFT)*</td>
<td>341</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (IFAT)***</td>
<td>348</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi ELISA)***</td>
<td>362</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Ectoparasites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mites</td>
<td>326</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Lice</td>
<td>29</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Ringworm</td>
<td>427</td>
<td>52</td>
<td>16</td>
</tr>
<tr>
<td>Dermatophilus</td>
<td>123</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Candida</td>
<td>202</td>
<td>7</td>
<td>4</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.

Overall, a total of 86 equine grass sickness (EGS) cases were reported during 2015. Six cases were reported during the fourth quarter (October – December), of which four occurred during October and two in November. The majority of cases occurred in England (67%, n=4) with the remainder in Scotland (33%, n=2). One affected premises reported having a prior history of EGS cases.

Three geldings and three mares/fillies were affected, with a median age of 9.5 years (range 1.5 – 21 years). Affected breeds were Welsh Cobs (n=2), Highland/Highland cross (n=2), Cob (n=1) and Westphalian (n=1).

Three cases were reported to have subacute EGS; two cases were reported to have acute EGS and one case was diagnosed with chronic EGS, which was reported to have survived to date. Diagnostic information was provided for all six cases, of which four were diagnosed based on veterinary assessment of clinical signs alone. Diagnosis of one subacute case was made at laparotomy with diagnostic confirmation obtained by histopathological examination of an ileal biopsy sample, and diagnosis of a second subacute case was confirmed at post mortem examination.
East Anglia

A total of 72 cases were examined including 56 aborted fetuses and fetal membranes.

Of the 56 aborted fetuses examined, placental insufficiency was identified in five cases, umbilical cord torsion in 35 cases, EHV-1 infection in two cases and placentitis in three cases. The cause of abortion could not be determined in eleven cases.

Two cardiovascular cases were examined; one case of sudden cardiac failure from terminal pulmonary haemorrhage and one case of presumed cardiac failure from toxicosis after yew ingestion.

Four cases of gastrointestinal disease were examined; single cases of large colon impaction, eosinophilic colitis due to cyathostomin infestation, salmonella enteritis, and septicaemia from enteric compromise.

Three musculoskeletal cases were examined; two cases of pelvic fractures, of which one consisted of multiple fractures of the left pelvic girdle resulting in delayed exsanguination. A third case identified a chronic stifle injury in a yearling, consistent with previous cranial cruciate ligament avulsion.

Two cases of neonatal mortality were examined; one case of brachygnathia and one case of palatoschisis.

One case of neoplasia was investigated, in which malignant neoplastic melanocytic proliferation was diagnosed.

One neurological case was examined, where encephalitis was identified from an ongoing sinusitis. There was an extension of the sinus infection into the ventral cranial cavity and third ventricle, via the sphenoidal sinus.

A single liver disease case was reported, in conjunction with cardiac failure. On examination, severe bridging hepatic fibrosis, haemochromatosis and myocardial necrosis was identified. This was likely to have developed from enteric compromise and subsequent systemic infection.

Two welfare cases were investigated in which severe emaciation was identified.

Home Counties

Nine cases were reported.

Four cases of gastrointestinal disease were examined that included two cases of large colon impaction, and single cases of small intestine volvulus and fibrinous serositis with associated adhesions from previous colic surgery.

One case of neoplasia, where an infiltrative ileal mass was identified as a stromal tumour on histopathological examination.

One case of liver disease was reported in which extensive megalocytosis, fibrosis and bilary hyperplasia was identified on histopathologic examination, consistent with pyrrolizidine alkaloid toxicosis.
One case of respiratory disease was examined, where pulmonary abscessation and haemorrhage had occurred due to foreign body penetration (thorns).

A single musculoskeletal case was examined in which bacterial osteomyelitis of the atlas and axis was identified.

One welfare case was investigated which identified typhlocolitis due to severe cyathostominosis.

**Northern England**

*One case was reported.*

A single musculoskeletal case was examined in which multiple pelvic fractures from previous trauma were identified.

**Scotland**

*Nine cases were reported.*

Three cases of gastrointestinal disease were investigated that included single cases of strangulating lipoma and stomach rupture, mesenteric tear with bowel torsion and typhlocolitis.

Two musculoskeletal cases, which included one case of severe head trauma and one case of a post-operative wound infection.

A single respiratory case of tracheal collapse.

A single ophthalmology case of a detached retina.

Two urology cases, which included one case of bilateral ectopic ureters and one case of renal papillary necrosis.

**Northern Ireland**

*One case was reported.*

A single musculoskeletal case was examined in which severe head and neck trauma was identified. This included a fractured hyoid bone, subdural haemorrhage in the rostral calvarium, extensive musculature haemorrhage of the ventral and left lateral neck and ecchymotic sub pleural haemorrhages within the thoracic cavity.
ACKNOWLEDGEMENTS

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
Beaufort Cottage Laboratories
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
The Royal Veterinary College
Three Counties Equine Hospital
Torrance Diamond Diagnostic Services (TDDS)
University of Edinburgh
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 AHVLA, 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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