Highlights in this issue:

- Low activity of Equine Herpes Virus-1 Abortion in the UK
- Equine Influenza in Europe and the USA
- Focus article: Glanders: is it a real 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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<td>20</td>
</tr>
</tbody>
</table>
Introduction

Welcome to the first 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 INFLUENZA VIRUS (EI)**

On 8th May 2015, a case of EI was confirmed on a premises in the Scottish Borders. The affected horse was a four-year-old unvaccinated Irish sport horse gelding that had recently been purchased from a dealer’s yard after arriving from Ireland. The gelding was first noted with clinical signs of serous nasal discharge, dry cough, and enlarged lymph nodes. The positive diagnosis was made by qPCR on a nasopharyngeal swab. There were two other vaccinated horses on the premises but neither was affected.

The outbreak has 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.

**EQUINE HERPES VIRUS-1 (EHV-1)**

Equine Herpes Virus-1 (EHV-1) Abortion

Two cases were reported in April 2015, one in Shropshire and one in Cheshire. Positive diagnoses were made by qPCR on a fetal samples but no further information was provided.

**EQUINE HERPES VIRUS-3 (EHV-3) Coital Exanthema**

On 15th May 2015, two separate cases of EHV-3 in Surrey and Norfolk were confirmed. In Surrey a Cob mare presented with clinical signs of oral mucosal ulceration on the tongue and lips. The positive diagnosis was made by virus isolation from buccal ulcers. The affected horse in Norfolk was a seven-year-old Thoroughbred mare that presented with encrusted lesions of the vulva two weeks after natural mating. The mare was reported as being ‘off-colour’ three days after mating. The positive diagnosis was made by virus isolation from a swab of the vulvar lesions.
International disease occurrence

GLANDERS (Burkholderia mallei)

Brazil
The Agricultural and Forest Protection Institute of Espirito Santo (IDAF) has reported that there are three outbreaks of Glanders in the state. Two of the outbreaks of Glanders are on private properties in Viana and Guarapari. IDAF also confirmed an outbreak in the Dr. Pedro Fontes Equine Breeding Centre in Cariacica, which houses part of the military police squad and in which 11 of 65 horses on the premises are reported to be due to be euthanased. All three properties remain quarantined and investigations into the sources of the outbreaks are continuing.

Germany
On 12th May 2015, The German Chief Veterinary Officer released a second follow-up report regarding the occurrence of Glanders in Germany. It reads:

The B. mallei incident has been declared resolved on 27th January 2015. Epidemiological investigations and tests on traceability were initiated directly after the first positive finding of the serological blood test. It was established that the affected horse had never been moved to other EU Member States or third countries. A total of 398 contact horses were identified on other holdings in Germany. All contact horses have been tested and found to be negative for Glanders. In addition to this, tests for export to third countries were carried out on 4,694 horses in 2014 and 1,655 horses in 2015 up to 14th April 2015; they all tested negative for Glanders. It is intended to provide further data once the six-month period following euthanasia of the animal concerned is over. Neither in the framework of the passive monitoring (examinations of horses intended for slaughter or found dead) nor in the movement of horses from another EU Member State or the import of horses from third countries have the competent authorities in Germany received any information on clinical signs that would have indicated the suspicion or outbreak of the notifiable disease Glanders. The source of B. mallei was not able to be determined, despite intensive tracing and testing. The conclusion drawn from all tests carried out so far is that the case in question was an isolated case and that Germany will, once the six months from the date on which the animal was euthanased are over, once more declare itself free of Glanders.

USA
One of a group of five clinically normal donkeys that strayed across the border from Mexico, close to the Rio Grande, has been reported as testing positive for Glanders in a complement-fixation test (CFT) conducted by the USDA. All five animals were impounded after being rounded up and with one exception; all have tested serologically negative for Glanders. Equine Glanders has not been diagnosed in the USA since 1942.
EQUINE INFLUENZA VIRUS (EI)

Croatia
On 4th April 2015, The Croatian Ministry of Agriculture, reported five outbreaks of equine influenza in Domankus (one horse), Bjelovar (two horses), Predavac (two horses), Cazma (five horses) and Zrinski Topolovac (one horse). All susceptible animals showed clinical signs of disease. Virus was confirmed by RT-PCR.

Germany
On the 17th April 2015, the Laboratory Dr. Böse GmbH (Germany) reported an outbreak of EI in Schleswig-Holstein State, Germany. Four non-Thoroughbred horses tested positive, of which three were vaccinated. Two of the horses presented with fever and two with coughing. Positive diagnoses were made by qPCR on nasopharyngeal swabs.

France
Diagnoses of EI were confirmed in three Thoroughbreds in an outbreak affecting 15 horses in a training centre in Pyrénées-Atlantiques during December 2014. The horses showed clinical signs of coughing and fever.

On 8th January 2015, an outbreak of EI was confirmed in a training centre in Maine-et-Loire. Three vaccinated Thoroughbreds were affected with clinical signs of coughing, nasal discharge and fever. This outbreak was epidemiologically linked to the outbreak that occurred in Pyrénées-Atlantiques in December 2014.

One outbreak of EI was confirmed in Eure-et-Loir on 2nd February 2015. The affected horse was a 10-year-old Saddlebred horse that was used for sport which showed clinical signs of fever and nasal discharge.

All diagnoses were made by PCR on nasal swabs.

USA
Outbreaks were confirmed in Kentucky (two outbreaks), Michigan (one outbreak) and South Dakota (one outbreak).

EQUINE HERPES VIRUS-1 (EHV-1)

Abortion
Belgium
In March 2015, two separate cases of EHV-1 abortion were reported in unvaccinated mares in the Antwerp and Mechelen regions. On 4th April 2015, a further outbreak of EHV-1 abortion was reported in Ranst region in which five unvaccinated mares aborted. In all cases positive diagnoses were made by qPCR on fetal tissues.

On 12th May 2015, an outbreak of EHV-1 abortion and neonatal foal death affecting three non-vaccinated mares was reported in the Diest region. On 15th May 2015, another outbreak of EHV-1 abortion affecting two non-vaccinated mares was reported in the Liege region of Belgium. Positive diagnoses were made by PCR on fetal lung and liver tissues in both cases.
France
Nine cases of EHV-1 abortion (two cases in one outbreak and seven single cases) have been confirmed during the first quarter of 2015. Breeds affected have included Thoroughbreds (four), French Trotter (one), Percheron (one) and French Saddlebred (one). The cases occurred in Calvados, Lot and Orne. The positive diagnoses were made by PCR.

Japan
Thirty-six cases of EHV-1 abortion (n=28) and neonatal foal death (n=8) were reported between 8th January 2015 and 21st April 2015, affecting vaccinated and unvaccinated Thoroughbreds on 19 separate premises. EHV-1 vaccination was incomplete in seven animals. Diagnoses were made by serology and agent isolation.

Neurological disease

Belgium
On 4th May 2015, a case of EHV-1 neurological disease was reported in the Maaseik region. The affected animal was an 11-year-old mare that presented with ataxia on 24th April 2015, with the positive diagnosis made on 30th April 2015 by PCR on a nasopharyngeal swab.

France
On 11th March 2015, an outbreak of EHV-1 neurological disease was confirmed in Seine-Maritime. The affected horse was a vaccinated mare that showed clinical signs of stiffness, paresis, ataxia, anorexia and weakness and was euthanased. The positive diagnosis was made by PCR on blood. Another horse on the same premises was confirmed with EHV-1 respiratory infection on 18th March 2015, by nasopharyngeal swab. The affected horse was an eight-month Connemara pony that showed clinical signs of fever and nasal discharge.

USA
Two outbreaks of EHV-1 neurological disease were reported in Michigan and Ohio respectively during March 2015.

In April 2015, two further outbreaks were also reported in Pennsylvania and Maryland.

Contagious Equine Metritis (CEM)

Germany
CEM was confirmed in two non-Thoroughbred breeding stallions on one premises. Diagnoses were made by bacterial culture and PCR on genital swabs.

Equine Infectious Anaemia (EIA)

France
On 20th March 2015, The Ministry of Agriculture and Fishery, France reported that the EIA event that occurred in early November 2014 in Gard was declared resolved. A subclinically infected mare was confirmed with EIA following a Coggin’s test carried out within the epidemiological investigation of the Montfaucun outbreak, in which a stallion had tested positive for EIA and was subsequently destroyed. No animals showed clinical signs and the infected mare was euthanased on 5th November 2014. All the other equines on the farm were negative on Coggin’s tests conducted every 30 days for three months. The epidemiological investigation did not identify precisely the source of infection in these two infected horses.
Italy
On 11th May 2015, the National Reference Laboratory of Equine Infectious Anaemia (CRAIE) reported that between 1st January 2015 and 30th April, five new EIA cases were confirmed on premises in Italy for the first time in 2015, in Abruzzo (one case), Lazio (three cases) and Sicilia (one case). Two new cases were reported in Lazio on a premises that had had infections confirmed in the past.

USA
As of 30th April 2015, there has been an official report of four cases of EIA in different locations in Henderson County, Western Tennessee, USA. Other than confirmation of the diagnoses of the infections, no additional information is currently available on whether any of these cases are epidemiologically linked or what is the source of virus for this recent series of cases.

Equine Viral Arteritis (EVA)
Germany
EVA was confirmed in a non-Thoroughbred breeding stallion with the positive diagnosis made by PCR and virus isolation on a semen sample.

Switzerland
One case of EVA was reported during the first quarter of 2015. Surveillance of this animal is ongoing.

Focus article
In this report we are pleased to include the second of the focus articles written by Sonia Gonzalez-Medina, Animal Health Trust and Balazs Toth, Animal Health & Plant Agency. This article provides an overview of Glanders threat in the current horse population. We reiterate that the views expressed in this focus article are the author’s own and should not be interpreted as official statements of AHPA, 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 January to March 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 first 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>
</tr>
</thead>
<tbody>
<tr>
<td>EVA ELISA</td>
<td>4290</td>
<td>48#</td>
<td>5</td>
</tr>
<tr>
<td>EVA VN</td>
<td>1197</td>
<td>59#</td>
<td>2</td>
</tr>
<tr>
<td>APHA EVA VN</td>
<td>398</td>
<td>16#</td>
<td>1</td>
</tr>
<tr>
<td>EHV-1/-4 CF test</td>
<td>302</td>
<td>3*</td>
<td>1</td>
</tr>
<tr>
<td>EHV-3 VN test</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>ERV-A/-B CF test</td>
<td>123</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Influenza HI test</td>
<td>123</td>
<td>0*</td>
<td>1</td>
</tr>
<tr>
<td>EIA (Coggins)</td>
<td>838</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>EIA ELISA</td>
<td>506</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>APHA EIA (Coggins)</td>
<td>514</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AHVLA WNV (cELISA))</td>
<td>1</td>
<td>0†</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Virus Detection</th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHV-1/-4 PCR</td>
<td>261</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>EHV-2/-5 PCR</td>
<td>20</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>EHV-3 virus isolation</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza NP ELISA</td>
<td>14</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Influenza Directigen</td>
<td>13</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Influenza PCR</td>
<td>167</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>APHA Influenza PCR</td>
<td>124</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza VI in eggs</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>EHV VI</td>
<td>35</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>EVA VI/PCR</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AHVLA EVA VI/PCR</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>31</td>
<td>4</td>
<td>6</td>
</tr>
</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
# = Seropositives include vaccinated stallions, * = Diagnosed positive on basis of seroconversion between paired sera ** = Seropositive due to vaccination
**Equine Influenza Virus (EI)**

On 10th March 2015, a case of EI was confirmed on a premises in North Yorkshire. The affected mare was an unvaccinated four-year-old Connemara that presented with clinical signs of pyrexia, inappetence, mild dry cough and mucopurulent nasal discharge for the preceding six days. Positive diagnosis was made by qPCR on a nasopharyngeal swab. There are three other horses affected out of 10 at the premises.

On the 25th March 2015, another case of equine influenza was confirmed on a premises in the Scottish Borders. The affected animal was a six-year-old unvaccinated Irish sport horse mare that presented with mucopurulent nasal discharge and cough for the preceding four days. Positive diagnosis was confirmed by qPCR on a nasopharyngeal swab.

**Equine Herpes Virus-1 (EHV-1)**

**Respiratory Disease**

Two cases were confirmed in February and one in March in Cheshire, Devon and Shropshire respectively. All animals presented with pyrexia, serous nasal discharge and cough. Positive diagnoses were made by qPCR on nasopharyngeal swabs.

**Abortion**

Four events occurred during this quarter:

In Suffolk, Oxfordshire and Berkshire the affected mares were vaccinated Thoroughbreds. Positive diagnoses were suspected on gross post mortem examination and confirmed by qPCR and histopathology in all cases. No other EHV abortions or suspected cases of EHV infection were detected on the affected premises.

The last case was confirmed in March on a 10-year-old unvaccinated non-Thoroughbred mare. Positive diagnosis was confirmed by qPCR and histopathology. There were two mares in contact of which one has tested positive by qPCR on a nasopharyngeal swab.
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 first quarter 2015**

<table>
<thead>
<tr>
<th>Organism</th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMO (HBLB)</td>
<td>7074</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>CEMO (APHA)</td>
<td>290</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Klebsiella pneumoniae#</td>
<td>6864 #</td>
<td>26#</td>
<td>25</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>6866¹</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>Strangles*culture</td>
<td>1407</td>
<td>348</td>
<td>19</td>
</tr>
<tr>
<td>Strangles PCR</td>
<td>1512</td>
<td>185</td>
<td>6</td>
</tr>
<tr>
<td>Strangles ELISA²</td>
<td>2460</td>
<td>211²</td>
<td>5</td>
</tr>
<tr>
<td>Salmonellosis</td>
<td>455</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>MRSA</td>
<td>273</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>172</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Clostridium difficile (toxin by ELISA or munichromatography)</td>
<td>185</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Borrelia (by ELISA)</td>
<td>27</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Rhodococcus equi culture/PCR</td>
<td>32</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Lawsonia intracellularis** culture/PCR</td>
<td>151</td>
<td>31</td>
<td>2</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; 2 seropositivity may be attributed to disease exposure, vaccination, infection and carrier states.

**APHA CEMO Data for the period January to March 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

Seventeen samples were submitted this quarter to the Animal and Plant Health Agency (APHA) and of these 15 were positive. From the incidents involving strains typed by the APHA, the serovars/phagetypes reported were S. Typhimurium (6 samples; DT1 (2 samples) and single incidents of DT195, DT40, DT66a and U302), S. Newport (7 samples) and monophasic Typhimurium variant S. 4,5,12:i:- DT193 (2 samples). Monophasic Salmonella Typhimurium DT193 is associated with pigs and cattle, Salmonella Typhimurium U302 a pig-related phage-type and DT1, DT66a and DT40 are likely to originate from wild birds. S. Newport is often associated with badgers. For more information from APHA about Salmonella in Great Britain, please visit https://www.gov.uk/government/statistics/salmonella-in-livestock-production-in-great-britain-2013
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 2015

<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>13</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Hepatic toxicoses</td>
<td>33</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Atypical myopathy</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

*Includes contributing laboratories with no cases submitted

### Table 4: Diagnostic parasitology sample throughput and positive results for the first 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><strong>Endoparasites</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascarids</td>
<td>4286</td>
<td>62</td>
<td>21</td>
</tr>
<tr>
<td>Cyathostomes</td>
<td>2336</td>
<td>93</td>
<td>10</td>
</tr>
<tr>
<td>Dictyocaulus</td>
<td>317</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Strongyles</td>
<td>4486</td>
<td>1404</td>
<td>24</td>
</tr>
<tr>
<td>Tapeworms (ELISA based testing)</td>
<td>109</td>
<td>43</td>
<td>3</td>
</tr>
<tr>
<td>Tapeworms (Faecal exam)</td>
<td>2215</td>
<td>152</td>
<td>21</td>
</tr>
<tr>
<td>Trichostrongylus</td>
<td>14</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Strongyloides</td>
<td>2471</td>
<td>282</td>
<td>24</td>
</tr>
<tr>
<td>Oxyuris equi</td>
<td>1398</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Fasciola</td>
<td>242</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Coccidia</td>
<td>499</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Cryptosporidia</td>
<td>21</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>APHA Theileria equi (CFT)*</td>
<td>82</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (IFAT)**</td>
<td>128</td>
<td>23</td>
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<tr>
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<tr>
<td>APHA Babesia caballi (CFT)*</td>
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<tr>
<td>APHA Babesia caballi (IFAT)**</td>
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<td>26</td>
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<tr>
<td>APHA Babesia caballi ELISA)**</td>
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<tr>
<td><strong>Ectoparasites</strong></td>
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<td>Lice</td>
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</tr>
<tr>
<td>Candida</td>
<td>307</td>
<td>1</td>
<td>5</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.

Only two equine grass sickness (EGS) cases were reported during the first quarter of 2015 (January – March), both of which occurred in March. Both cases occurred in England, affecting two mares (one Welsh Section B and one Cob) aged 12 and 5 years respectively.

One of the cases was diagnosed with acute EGS and the other presented with the subacute clinical form: both were euthanased and were diagnosed based solely on veterinary assessment of clinical signs. Premises data were only reported for one case, with no prior history of EGS cases on the affected premises.

The EGS vaccine trial recruitment is still ongoing, to request further details about the trial and how to enrol clients with eligible horses/ponies contact the EGS vaccine trial team at the Animal Health Trust (email equinegrasssickness@aht.org.uk or telephone 01638 555399)
Introduction

Although every equine practitioner learned about this disease from textbooks and articles, very few of us actually ever saw a case of this disease and we all consider it to be long gone from Europe. Recent events in Germany however remind us that the disease is still present in a number of places around the world and we should maintain our awareness of this serious infectious disease as it can appear in well looked after competition horses. Although the German incident could not be linked to international horse movements, this risk pathway cannot be discounted. More on this later!

Glanders was already described by the early Greeks and Romans and became a worldwide problem in equids for several centuries. As a result of systematic eradication efforts however the disease was eradicated from most countries by the middle of the last century. During World War I, this bacterium was used as a biological warfare agent against the horses of the Allied forces and it is still considered significant as a potential agent of bioterrorism today. Outbreaks are now relatively uncommon and reported from limited geographical areas such as Eastern Europe, Middle East, Asia (including the Indian subcontinent) and Brazil.

Glanders is a serious zoonotic bacterial disease that primarily affects horses, mules and donkeys. Occasional cases occur in other mammalian species, mainly cats but also dogs, rodents, small ruminants and camels. The disease is usually fatal, nevertheless equids can be chronically infected and act as a reservoir. Although human disease is uncommon, without antibiotic treatment, the mortality rate can be as high as 95%.

Aetiology and pathogenesis

Glanders is caused by Burkholderia mallei, a short, rod-shaped, gram-negative, aerobic and facultative intracellular bacterium that is evolutionarily related to B. pseudomallei, the agent of melioidosis. B. mallei is a host-adapted pathogen that does not persist in the environment for long periods of time, although reputedly it can survive in contaminated soil for three to five weeks under humid and dark conditions. The organism is thought to gain entrance through mucous membranes; via water, feed and equipment contaminated with skin exudates and respiratory secretions from infected equids as well as via aerosols. The disease is usually introduced to an area by “silent spread”, i.e. via a carrier horse, donkey or mule and these usually subclinically infected animals can shed the bacteria under certain conditions some time later. Poor sanitation and poor biosecurity as well as crowding are all considered risk factors.
Clinical signs and differential diagnoses

The disease tends to be more acute and have a higher mortality in donkeys and mules than the chronic course seen in horses. Chronic infections develop over several weeks to months and may initially be subclinical. Latently affected animals may be ill for some months and apparently recovered or have minimal signs of illness and go unnoticed. In both cases, these animals will serve as a pathogen reservoir for other healthy animals.

Three forms of Glanders are described:

- **Cutaneous (Farcy):** Affecting mainly subcutaneous tissues and lymph nodes. Nodules develop following the lymphatic vessels that enlarge and ulcerate creating crater-shaped lesions with exudation.
- **Nasal:** Small nodules (stellate scars) form in the nasal septum and quickly progress to deep ulcers with raised and irregular borders that may obstruct the nasal passages causing dyspnoea. Mucopurulent nasal discharge and enlarged submandibular lymph nodes are the most obvious external signs, sometimes accompanied by orchitis.
- **Pulmonary:** Presents with pyrexia, septicaemia and bronchopneumonia. Small nodules with caseous or calcified centres in the pulmonary tissue are commonly identified on post mortem examination. Animals affected with this form can die rapidly or develop chronic abscessation with various degrees of respiratory difficulty.

The differential diagnoses for glanders include: strangles (Streptococcus equi), ulcerative lymphangitis (Corynebacterium pseudotuberculosis), epizootic lymphangitis (Histoplasma farciminosum), sporotrichosis (Sporothrix schenckii), and melioidosis (B. pseudomallei) although only the first two would be expected to be found in the UK.

Notification and Diagnosis

The isolation of the bacteria from samples collected from clinically affected animals is commonly unsuccessful. So a negative result from culture does not mean that the horse is free from infection as the presence of the bacteria in the various exudates changes over the course of disease. Post mortem examination is usually necessary to detect the organism by culture or PCR. Therefore, to rule out the possibility of glanders infection in live animals, serological tests are used for initial diagnosis.

In the UK, any suspicion of glanders must be notified to the Animal and Plant Health Agency (APHA) immediately. APHA operates a 24/7 on call service so suspect cases of exotic notifiable disease can be notified and followed up as quickly as possible.

To find your nearest APHA office, the agency has a postcode search tool available here: http://ahvla.defra.gov.uk/postcode/index.asp

Once the suspicion of glanders is notified, an APHA veterinary officer will investigate immediately and attend the premises as soon as practicable. As the suspicion of glanders can be notified by anyone, the treating veterinary surgeon may or may not be present on the premises. If the private vet is also present at the inquiry, there is an added benefit of consultation regarding the case so that all details can be explored rapidly such as clinical, vaccination and treatment history as well as recent movements of the suspect horse itself or some of its contacts.
As an outcome of the APHA veterinary inquiry, the suspicion can be ruled out based on the veterinary judgement of the official veterinarian(s), having considered all relevant aspects of the situation. Before any decision is taken, a telephone report takes place between the investigating APHA veterinary officer and a specialist veterinary adviser in London to ensure that no aspect of the inquiry was missed and all such investigations are carried out to the same high standards.

If however the suspicion of glanders cannot be ruled out, samples will have to be taken and submitted by APHA to the UK's National Reference Laboratory for glanders in Weybridge. Initially these are blood samples for serology. In some circumstances further samples such as nasopharyngeal or skin swabs or maybe even a sample of the nasal or skin discharge may be required.

Most often, the suspicion of glanders arises during routine laboratory testing, if clinically healthy horses are serologically tested as part of pre-export requirements. Although the standard serological test (the CFT – complement fixation test) is an accurate test in general, nonspecific reactions occasionally happen which need to be differentiated from a true infection.

In GB, APHA follows up all glanders test results that are not clearly negative by attending the premises, examining the horse, gathering epidemiological information such as travel history to assess the risk of the result potentially being a true positive. Further samples are also taken for confirmatory testing, where the CFT is repeated but other tests such as immunoblot and, if appropriate, PCR are used to reach a conclusion.

Such inquiries fortunately are relatively rare but in some cases it takes a considerable amount of time to gather sufficient information to confidently rule out the possibility of infection.

In all such cases, APHA works in partnership with the owners and vets of the horses involved and the inquiry is greatly helped by the information provided throughout the investigation.

Relevance

Glanders is a serious infection and confirmation of disease is reportable to the European Union as well as the World Organisation for Animal Health (OIE). Despite the fact that many countries are free from this disease, glanders is occasionally reported from countries in the Middle East, Asia and South America and pose a constant threat of reintroduction of disease to free areas. To prevent this, strict health and biosecurity protocols are in place for international movements of horses. There is no vaccine available against glanders and treatment is not fully effective so control of infection in most countries is achieved through slaughter of horses which are identified as infected.

An isolated case of glanders was confirmed in Germany in January 2015 – the first case in that country since 1955. It serves as a reminder that disease freedom cannot be taken for granted as the confirmed case was detected in a clinically healthy horse during routine pre-export testing, similar to the investigations APHA carries out in the UK in a few horses every year. The German veterinary authorities carried out an extensive epidemiological investigation and established that the horse, which was born in Germany, never left the country. A total of 398 contact horses were identified and all were tested for Glanders with negative results. Despite the high number of horses traced and tested, the source of the infection could not be established. Germany also tested 4,694 horses in 2014 and 1,655 horses in 2015 (up to 14/04/15) as part of routine pre-export testing and no positive results were obtained, which will allow for the country to be declared free from glanders again.
Although the conclusion of the German incident is reassuring, it reminds us that the disease threat is real and glanders still can find its way into well managed stables in Western Europe. Therefore, we would like to encourage every veterinary practitioner to consult with APHA if in any doubt whether glanders is suspected - it is our shared responsibility to keep the UK horse population free from this important disease.
**East Anglia**

A total of 63 cases were examined including 43 aborted fetuses and fetal membranes.

Of the 43 aborted fetuses examined, placentitis was identified in eight cases, placental insufficiency in six cases and umbilical cord torsion in 11 cases. Congenital malformation was found in three cases. The cause of abortion could not be determined in 12 cases. EHV abortion was determined in three cases from separate premises.

Seven cases of neonatal death were reported; three cases were related to dystocia, two linked to exsanguination due to multiple rib fracture and profuse bleeding at the umbilical stalk respectively. Hypoxic ischemia encephalopathy was diagnosed in one case. The last case was a foal euthanased due to severe arthrogryposis.

Five cardiovascular cases were examined in which rupture of the uterine artery with subsequent exsanguination were diagnosed in all cases.

One musculoskeletal case was examined in which a pelvic fracture was found.

One neoplasia case was investigated, in which a haemangiosarcoma was diagnosed.

A single neurological case was investigated; in which cervical spinal cord haemorrhage was found.

Two horses were examined following gastrointestinal disease; single cases of ileal rupture due to parasitic infestation and gastric rupture were reported.

A single liver disease case was reported in which ragwort toxicity was diagnosed.

Two welfare cases were investigated in which severe emaciation linked to parasitic infestation and weakness and recumbency probably due to the severe internal parasitism were identified in both cases.

**Home Counties**

Eighteen cases were reported.

Nine cases of gastrointestinal disease were reported; single cases of severe gastric ulceration, gastric rupture, ileal intussusception, large colon volvulus and subacute peritonitis were diagnosed. Two cases of post-operative ileus and two cases of epiploic foramen entrapment were also found.

Three neurological cases were investigated; in which a neurofibroma compressing the spinal cord at the level of C6, vertebral malformation at the level of C2-C3 and suppurative encephalitis were diagnosed. One further case with ataxia and muscle tremors of unknown origin was examined.

Two musculoskeletal cases were examined; polysaccharide storage myopathy and atypical myopathy were diagnosed.

A single liver disease case was reported in which ragwort toxicity was suspected.
Three welfare cases were investigated, two presented with severe cyathostominosis and one with dermatophilosis and endotoxaemia.

**Northern England**
*Three cases were reported.*

A single aborted fetus was examined in which umbilical cord torsion was diagnosed.

A single gastrointestinal case was investigated with suspected grass sickness

A single musculoskeletal case was reported in which a myopathy was suspected.

**South West**
*Four cases were examined.*

One aborted fetus was examined in which cord torsion and mild placentitis were found.

Two cases of gastrointestinal disease were investigated; proliferative enteritis was diagnosed in one case. The cause could not be determined in the second case.

A musculoskeletal case was examined, in which several ischial fractures that led to peritoneum perforation and exsanguination were found.

**Scotland**
*Ten post-mortem examinations were reported.*

Six gastrointestinal cases were reported. Single cases of ileal perforation, colon displacement, small colon obstruction, jejunal hypertrophy, grass sickness and oesophageal dilatation with subsequent perforation were found.

A single case of neonatal death was investigated in which sepsis was diagnosed.

A single musculoskeletal case was examined in which exertional rhabdomyolysis was found.

One sudden death case was investigated in a Thoroughbred that collapsed during racing, arteriosclerosis of the coronary arteries was found.

One welfare case was examined. Fistulous withers and pituitary adenoma were confirmed.

A single case of renal failure was investigated, in which bilateral nephritis and papillary necrosis was found.

**Northern Ireland**
*Seven cases were reported.*

Six aborted fetuses were examined; single cases of cord torsion and mild placentitis due to streptococcal infection were found. Two cases of EHV-1 abortion were diagnosed. The cause of abortion was not found in another two cases.

One welfare case was examined in which parasitism and emaciation was found.
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
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
Oakham Veterinary Hospital
The Donkey Sanctuary
The Royal Veterinary College
Three Counties Equine Hospital
Torrance Diamond Diagnostic Services (TDDS)
University of Edinburgh
University of Glasgow
Valley Equine Hospital

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

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