Highlights in this issue:
• Equine Influenza in the UK
• Equine Herpes Virus in Europe
• Focus article: Hendra in Australia

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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</table>
Introduction

Welcome to the second quarterly equine disease surveillance report for 2014 produced by the Department for Environment, Food and Rural Affairs (Defra), British Equine Veterinary Association (BEVA), Animal Health and Laboratories Agency (AHVLA) 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)

EHV-1 Neurological Disease
On 11th July 2014, a case of EHV-1 neurological disease was confirmed in Somerset, England. The affected horse was a Thoroughbred mare that had presented with clinical signs of moderate hindlimb ataxia. The positive diagnosis was made by positive serology and qPCR on a nasopharyngeal swab. This case was epidemiologically linked to the case reported in the virological section. The affected mare was isolated and control measures were put in place in line with the Horserace Betting Levy Board (HBLB) Codes of Practice.

EQUINE INFLUENZA VIRUS (EI)

On 15th August 2014, a case of equine influenza was reported on a premises in West Lothian, Scotland. The affected animal was an eight-year-old unvaccinated mare that had shown clinical signs of inappetence, pyrexia, cough and mucopurulent nasal discharge for the previous 48 hours. Positive diagnosis was made by qPCR on a nasopharyngeal swab. There were another 10 horses at the premises of which none was affected so far.

On 18th August 2014, another case of equine influenza was confirmed on a premises in Bedfordshire, England. The affected animal was an eight-year-old unvaccinated pony that had showed clinical signs of pyrexia, serous nasal discharge and intermittent dry harsh cough for the previous three days. The positive diagnosis was made by qPCR on a nasopharyngeal swab. There were another 20 unvaccinated horses at the premises of which none displayed clinical signs of disease.

H3N8 equine influenza was isolated from both samples. Sequence analysis of the isolates revealed that they belong to clade 2 of the Florida sublineage, and that they shared the substitution at amino acid 144 of the HA1 protein with other recent clade 2 viruses isolated in the UK.

The outbreaks have been reported by the text alert service sponsored by Merial Animal Health, Tell-Tail. This free service, for UK equine practitioners, 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. This service has also been offered to the members of the National Trainers Federation (NTF).
HBLB supports equine influenza surveillance in the UK, including free diagnostic testing for practices that sign up for the AHT’s sentinel practice scheme. To register for the scheme and for more information on equine influenza UK vets should visit www.equiflunet.org.uk.

International disease occurrence

EQUINE INFLUENZA VIRUS (EI)

France
On the 19th May 2014, an outbreak of equine influenza was confirmed in a riding school in Seine-et-Marne, France. The affected horse was a four year old Shetland pony imported recently from Netherlands. Two horses were reported to show clinical signs of nasal discharge, cough and fever. The positive diagnosis was made by qPCR on a nasopharyngeal swab.

EQUINE HERPES VIRUS-1 (EHV-1)

Neurological disease

Belgium
On the 6th May 2014, a case of EHV-1 neurological disease was reported in Dendermonde, Belgium in a seven-year-old, non-vaccinated mare. The positive diagnosis was made by PCR on a nasopharyngeal swab.

France
On 16th May 2014, one outbreak of EHV-1 neurological disease was confirmed in Vendée. The affected horse was an unvaccinated mare used in a riding school that presented with clinical signs of lethargy, ataxia and stiffness. Positive diagnosis was made by PCR on blood.

Germany
During the second quarter, a single case of EHV1-neurological disease was confirmed by PCR on nasopharyngeal swab involving a non-neuropathogenic strain of EHV-1, the horse presented with fever and ataxia. In addition, a further two cases with no clinical description available were reported both involving non-neuropathogenic strains of EHV-1.

USA
The second quarter of 2014 saw a significant number of outbreaks of EHV-1 neurological disease involving premises in Wisconsin (one case), Virginia (one case), N. Dakota (one case), Pennsylvania (two cases), Kansas (one case), S. Dakota (one case), Colorado (two cases) and Massachusetts (one case). The vast majority of cases of the disease were associated with non-neuropathogenic strains of the A2254 genotype of EHV-1. Quarter horses were primarily involved with many of the cases linked to exposure at barrel racing events.

Abortion/Neonatal foal death

Belgium
On the 7th April 2014, one case of EHV-1 abortion was reported in an unvaccinated mare in Pecq. Post mortem examination of the fetus revealed a large amount of serous fluid in the thorax and white foci on the liver. The positive diagnosis was made by PCR on fetal lung tissues. Several horses on the yard where the mare was kept prior to the abortion were reported to have suffered nasal discharge and fever in the preceding weeks.
France
Three isolated cases were confirmed in April 2014, in Doubs, Orne and Calvados and a further outbreak in Tarn-et-Garonne affecting four mares on the same premises. Positive diagnoses were made by PCR on fetal and placental tissues.

Germany
Five cases of EHV-1 associated disease were confirmed on five premises. These included a single case of abortion with diagnosis by PCR on uterine discharge and lung aspirate and a single case of a weak non-viable foal with diagnosis by PCR on lung aspirate.

Japan
A single case of EHV-1 neonatal foal death in a non-vaccinated Thoroughbred was confirmed in May 2014.

EQUINE HERPES VIRUS- 3 (Coital Exanthema)

United States of America
Two cases were confirmed in Kentucky, USA.

CONTAGIOUS EQUINE METRITIS (CEM)

Germany
CEM was confirmed in 11 non-Thoroughbreds (five stallions and six mares) on 10 premises in Germany. Positive diagnoses were made by bacterial isolation of *Taylorella equigenitalis* and by PCR on genital swabs.

EQUINE INFECTIOUS ANAEMIA (EIA)

Canada
Between 1st April 2014 and 30th June 2014, there was a total of 26 EIA positive equines identified in the province of Saskatchewan on 10 separate premises. Two of the 10 premises were part of ongoing 2014 disease investigations. Four of the 10 premises had been affected in previous years; two in 2011 and two in 2012. All EIA infections were confirmed on the basis of Agar Gel Immuno Diffusion (AGID; Coggins) serology.

Italy
On 26th August 2014, the Centro di Referenza Nazionale per Anemia Infettiva Equina (CRAIE) reported that between 1st January and 8th August 2014, 18 EIA infections have been confirmed in Italy for the first time on premises in the following regions: Abruzzo (1), Basilicata (2), Campania (5), Lazio (6), Lombardia (1), Molise (1) Pluglia (1)and Umbria (4).

Additional cases were identify on three separate premises, two in Lazio and one in Campania, affected in previous years, Lazio (2) and Campania (2)

United States of America
A total of six cases of EIA were confirmed on a premises in Western Tennessee among a closed herd of horses that have had no additional animals introduced for a significant number of years. The disease was detected when a horse from the farm was sent for sale and came up positive for antibodies to the virus. In late June, EIA was diagnosed in a horse on a premises in Wyoming. The infected animal was euthanased. Initial testing of all other equids on the affected and adjacent premises failed to detect any additional cases.
EQUINE VIRAL ARTERITIS (EVA)

Germany
Equine viral Arteritis (EVA) was confirmed in one non-Thoroughbred stallion with the positive diagnosis made by PCR on a semen sample in Germany.

EQUINE EASTERN ENCEPHALOMYELITIS (EEE)

United States of America
Additional cases of EEE have been confirmed in Florida, Louisiana and North Carolina in the USA, bringing the current national total to 69 as of 5th September 2014. Case numbers by state are as follows: Alabama (2), Florida (46), Georgia (4), Louisiana (5), Massachusetts (1), New York (1), North Carolina (6), South Carolina (3), Texas (1).

HENDRA VIRUS

Australia
During the second quarter, 92 equine submissions for Hendra virus (HV) disease investigation were made to Queensland's Biosecurity Science laboratory of which 16 submissions were made for health testing to exclude HV in healthy horses before interstate or international movement, movement to stud, or veterinary procedures that posed a high risk of disease transmission.

There was only one incident of HV infection confirmed at a property in the Bundaberg Regional Council. In mid-March, a five-year-old quarterhorse mare was initially off food and pyrexic (41 °C) and deteriorated over three days, developing respiratory signs (tachypnoea) leading to euthanasia. Several dogs and unvaccinated horses that were assessed as having had potentially infectious contact with the infected horse on the same property and a neighbouring property were quarantined, monitored and tested. These animals remained clinically well, and three rounds of PCR and serological tests were negative for HeV. The quarantines were lifted in mid-April. All other HeV investigations during the quarter were negative.

AFRICAN HORSE SICKNESS (AHS)

South Africa
On the 28th May 2014, the Department of Agriculture, Forestry and Fisheries, Animal Production and Health in Pretoria, South Africa reported seven new outbreaks of AHS within the country’s AHS controlled area in Western Cape Province. A total of 12 cases including two deaths have been confirmed among 269 susceptible animals on the seven affected premises, Bergriver (2), Breed Valley (1), Drakenstein (2), Witzenberg (1) and Robertson (1). Quarantine of the premises and restricted movements inside the country have been implemented and are ongoing.

On the 24th June 2014, the Department of Agriculture, Forestry and Fisheries, Animal Production and Health in Pretoria, reported that outbreaks of AHS that started in April 2014 in Breede Valley, Western Cape Province were resolved.
Swaziland
On the 20th June 2014, the Ministry of Agriculture of Swaziland reported two outbreaks of AHS in Hhohho Region. A total of two deaths among three cases have been confirmed among 42 susceptible animals on two premises in the Stroma Nelson area. The outbreaks started on 9th June 2014, with the diagnosis confirmed by the OIE AHS reference laboratory at Onderstepoort Veterinary Institute (OVI) in South Africa on 17th June 2014 by nested RT-PCR. Control measures were applied although vaccination was not adopted.

ATYPICAL MYOPATHY
As of 6th April 2014, there were 23 clinical cases compatible with diagnoses of atypical myopathy in France that were communicated to RESPE since the beginning of the year.

VESICULAR STOMATITIS (VS)
United States of America
Twenty-seven new positive premises have been reported as of 4th September 2014, all involving the New Jersey serotype of the virus. Of that total, 26 were confirmed in Colorado and one in Texas. The current number of outbreaks in Colorado is 248 and in Texas 58. Of the collective total number of VS positive premises in both states of 306, 296 have been positive equine premises, eight positive bovine premises and two positive for both equines and bovines. To date, a total of 344 equines have been confirmed infected in Colorado and 82 in Texas. The number of VS virus positive premises in Colorado under quarantine currently stands at 208 and 35 in Texas.

WEST NILE VIRUS (WNV)
Greece
On the 10th July 2014, the Ministry of Rural Development and Food, Greece, reported a subclinical case of WNV to the World Organisation for Animal Health (OIE) in Kretiri-Makedonia. The horse was diagnosed during the serosurveillance program in a premises with 30 horses. Positive diagnosis was made by Ig-M capture ELISA on a blood sample.

Turkey
On the 5th September 2014, a case of WNV in a horse that died during the course of the disease was confirmed in Bursa. The outbreak started on 18th August 2014 with the diagnosis confirmed by Etlik Central Veterinary Control and Research Institute (Turkey) on 2nd September 2014 by RT-PCR. The positive case was confirmed among 300 susceptible animals. Control measures have been undertaken including quarantine of the premises, zoning, screening, disinfection of infected premises and control of arthropods.

United States of America
The number of confirmed cases of WNE continues to increase nationally in the USA. As of 3rd September, new or additional cases have been reported in Arizona, California, Idaho, Louisiana, Maryland, Minnesota, Missouri, Oregon and Wyoming. Respective totals by state are as follows: Alabama (1), Arizona (2), California (4), Colorado (2), Florida (2), Idaho (2), Louisiana (1), Michigan (1), Minnesota (1), Missouri (1), New Mexico (2), North Dakota (2), Oregon (2), South Dakota (1), Texas (1), Washington (1), Wisconsin (1), Wyoming (3).
Defra / Animal Health and Veterinary Laboratories Agency (AHVLA) business

There was none.

Focus article

In this report we are pleased to include a focus article written by Kristopher Hughes, Associate Professor in equine medicine at Charles Sturt University, New South Wales, Australia. The article provides an overview of Hendra virus in Australia and the recent advances in the control of this disease.

We reiterate that the views expressed in this focus article are the author’s own and should not be interpreted as official statements of Defra, 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 2014 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 Health Veterinary Laboratories Agency (AHVLA), Weybridge. The sample population for the AHVLA is different from that for the other contributing laboratories, as the AHVLA’s tests are principally in relation to international trade (EVA and EIA). AHVLA now provides testing for WNV as part of clinical work up of neurological cases on specific request and provided the local regional AHVLA office has been informed.

Table 1: Diagnostic virology sample throughput and positive results for the second quarter of 2014

<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>1220</td>
<td>54#</td>
<td>5</td>
</tr>
<tr>
<td>EVA VN</td>
<td>554</td>
<td>32#</td>
<td>3</td>
</tr>
<tr>
<td>AHVLA EVA VN</td>
<td>370</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>EHV-1/-4 CF test</td>
<td>204</td>
<td>15*</td>
<td>2</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>89</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza HI test</td>
<td>111</td>
<td>0*</td>
<td>1</td>
</tr>
<tr>
<td>EIA (Coggins)</td>
<td>501</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>EIA ELISA</td>
<td>718</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>AHVLA EIA (Coggins)</td>
<td>630</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AHVLA WNV (cELISA)</td>
<td>0</td>
<td>0¹</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>205</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>EHV-2/-5 PCR</td>
<td>19</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>EHV-3 virus isolation</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Influenza NP ELISA</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Influenza Directigen</td>
<td>46</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Influenza PCR</td>
<td>180</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Influenza VI in eggs</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AHVLA Influenza PCR</td>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>EHV VI</td>
<td>42</td>
<td>15</td>
<td>1</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>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>73</td>
<td>19</td>
<td>9</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 ¹ = Negative by IgM capture ELISA.
Virological Diagnoses for the Second Quarter of 2014

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

**Respiratory disease**
Four outbreaks were reported in April. The first case was confirmed in a mare in Cheshire that tested also positive for S.equi. The animal showed clinical signs of mucopurulent nasal discharge and fever. The second case was detected on a premises in West Linton, Scotland. The affected horse was a seven-year-old unvaccinated gelding showing clinical signs of depression, mucopurulent nasal discharge and fever for two weeks. The gelding had arrived recently at the premises and developed the clinical signs during its isolation period. The third case was confirmed in Northamptonshire in a six-year-old gelding showing clinical signs of coughing and mucopurulent nasal discharge for a week. The last outbreak was confirmed in two donkeys on a premises in Devon, England. The affected donkeys showed clinical signs of mucopurulent nasal discharge, cough and fever for five days. All positive diagnoses were made by qPCR on a nasopharyngeal swab.

**Abortion**
Three abortion cases related to EHV-1 were confirmed this quarter, all of them in non-Thoroughbred mares. Cases were located in Berkshire, Gloucestershire and West Yorkshire respectively. The mares were in the last trimester of pregnancy and positive diagnoses were made by histopathology and PCR applied to fetal tissues.

**Neurological disease**
On the 16th June, one case of EHV-1 neurological disease was confirmed in a Thoroughbred mare on a mixed-breed stud premises in Devon. The mare had shown clinical signs of ataxia for the previous five days. The positive diagnosis was made by qPCR on a nasopharyngeal swab.

**Equine Herpes Virus-3 (EHV-3) Coital exanthema**
In late April, an outbreak of EHV-3 was confirmed on a premises in Devon. The affected animals were a jenny and her foal. The foal was first presented with clinical signs of pyrexia and multiple oral vesicles over his lips, mouth and tongue. The mare presented subsequently vesicles on the udder. Positive diagnosis was made by virus isolation of the vesicle contents of the foal and further backup by serology of both animals. They recovered uneventfully.
A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Table 2. For contagious equine metritis (CEM) all 29 HBLB approved laboratories in the UK contributed data.

Table 2: Diagnostic bacteriology sample throughput and positive results for the second quarter 2014

<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>CEMO (HBLB)</td>
<td>3887</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>CEMO (AHVLA)</td>
<td>242</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>3975¹</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>4049¹</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Strangles*culture</td>
<td>1643</td>
<td>76</td>
<td>25</td>
</tr>
<tr>
<td>Strangles PCR</td>
<td>1420</td>
<td>158</td>
<td>4</td>
</tr>
<tr>
<td>Strangles ELISA</td>
<td>2358</td>
<td>235²</td>
<td>4</td>
</tr>
<tr>
<td>Salmonellosis</td>
<td>177</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>MRSA</td>
<td>840</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>195</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Clostridium difficile</td>
<td>209</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Borrelia (by ELISA)</td>
<td>57</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Rhodococcus equi culture/PCR</td>
<td>398</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Lawsonia intracellularis culture/PCR</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

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

AHVLA CEMO Data for the period April to June 2014
We are again pleased to include data relating to CEM testing from the Animal Health Veterinary Laboratories Agency (AHVLA), in this quarterly report. The sample population for the AHVLA is different from that for the other contributing laboratories as the AHVLA 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 seroconversion using a serological ELISA.

AHVLA Salmonella results
Twenty-one samples were submitted this quarter to the AHVLA and of these, 15 were positive. From the incidents involving strains typed by the AHVLA, the serovars/phagetypes reported were monophasic Typhimurium variants S. 4,5,12:i:- (4 samples; 2 DT193, 1 U311 and 1 untyped), S. 4,12:i:- DT193 (1 sample), S. Kedougou (1 sample), S. Newport (1 sample), S. Typhimurium (7 samples; single incidents of DT104, DT2, DT41, DT66a, U302, U319 and one untyped), and S. 61:k:1,5 (1 sample). Monophasic Salmonella Typhimurium DT193 is associated with pigs and cattle.
S. Typhimurium DT104 is likely to be of human origin and DT66a is found in wild birds. S.Newport is often associated with badgers, S. 61:k:1,5 with sheep and S. Kedougou is a feed-related serovar. For more information from AHVLA about Salmonella in the UK, please visit http://www.defra.gov.uk/ahvla-en/publication/salm12/
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 second quarter 2014**

<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>41</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Hepatic toxicoses</td>
<td>29</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>Atypical myopathy</td>
<td>6</td>
<td>2</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 second quarter 2014**

<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>5361</td>
<td>439</td>
<td>19</td>
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<tr>
<td>Cyathostomes</td>
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<tr>
<td>Strongyles</td>
<td>5830</td>
<td>2171</td>
<td>26</td>
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<tr>
<td>Tapeworms (ELISA based testing)</td>
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<tr>
<td>Tapeworms (Faecal exam)</td>
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<td>83</td>
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<tr>
<td>Strongyloids</td>
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<td>Oxyuris equi</td>
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<td>Coccidia</td>
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<tr>
<td>VLA Theileria equi (CFT)*</td>
<td>76</td>
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<td>1</td>
</tr>
<tr>
<td>VLA Theileria equi (IFAT)**</td>
<td>219</td>
<td>15</td>
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</tr>
<tr>
<td>VLA Theileria equi (cELISA)***</td>
<td>156</td>
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<td>1</td>
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<tr>
<td>VLA Babesia caballi (CFT)*</td>
<td>76</td>
<td>1</td>
<td>1</td>
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<tr>
<td>VLA Babesia caballi (IFAT)**</td>
<td>219</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>VLA Babesia caballi (cELISA)***</td>
<td>156</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Ectoparasites</td>
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<td>Mites</td>
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<td>Lice</td>
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<tr>
<td>Dermatophilus</td>
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</tr>
<tr>
<td>Candida</td>
<td>95</td>
<td>0</td>
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</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 onfirmatory 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.

A total of 48 cases of equine grass sickness (EGS) have been reported during the second quarter of 2014 (April – June), of which 52% occurred in England (n=25), 31% occurred in Scotland (n=15), 2% occurred in Wales (n=1), and location was not reported for 14% of cases (n=7). These cases comprised 52% geldings (n=25), 40% mares/fillies (n=19), one stallion (2%) and sex was not reported for the remaining two cases. The median age of affected animals was 6 years (range 1.25 – 25 years). Affected breeds included Welsh or Welsh crosses (n=11), Cob or Cob crosses (n=9), British native pony breeds (n=6), Thoroughbred or Thoroughbred crosses (n=4) and Warmblood or Warmblood crosses (n=4).

Thirty-seven percent of cases (n=18) were reported to have acute EGS, 19% (n=9) were reported to have sub-acute EGS and 35% (n=17) were diagnosed with chronic EGS. Of the 17 cases of chronic EGS, 53% (n=9) were reported to have survived to date. Diagnostic information was only provided for 40% of cases (n=19); of these, the majority were diagnosed based on clinical signs alone (89%; n=17). Two animals underwent surgery with diagnostic confirmation obtained by histopathological examination of ileal biopsy samples.

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

In recent times, Australia has experienced several outbreaks of equine viral disease, both endemic and exotic. Equine influenza (EI) virus, an exotic pathogen in Australia, breached quarantine in August 2007, resulting in widespread respiratory disease and disruption to equine industries until containment and eradication of the virus. Australia was declared officially free of EI in June 2008. While Australia is one of few countries that has successfully eradicated EI, the widespread outbreak was a costly reminder of the potential effect of an introduced infectious pathogen into a susceptible population.

From an endemic perspective, Australia also experiences sporadic and unpredictable outbreaks of equine viral diseases, which may result in considerable animal morbidity and mortality and are caused by zoonotic pathogens. Of greatest importance are Hendra virus (genus Henipavirus) and arboviral infections, including flaviviruses in the family Flaviviridae (Kunjin virus, Murray Valley encephalitis virus (MVEV) and Ross River virus (RRV), a member of the genus Alphavirus, family Togaviridae.

The equine viral events in Australia over the past two decades highlight the evolving nature of infectious diseases and the need for ongoing monitoring, veterinary and industry awareness, greater understanding of disease epidemiology, reservoir and vector ecology and optimisation of prevention and early disease detection. In the first of two articles an overview of Hendra virus in Queensland and New South Wales is provided with a review of arboviruses affecting horses in Australia appearing in a subsequent report.

HeV: Clinical syndrome

Hendra virus results in a widespread vasculitis and a typically rapidly progressive clinical deterioration. Initial signs include pyrexia, tachycardia, and weight shifting between limbs. Progression results in often dramatic and non-pathognomonic clinical findings. Most commonly, respiratory signs (respiratory distress, coughing, pulmonary oedema, frothy nasal discharge) or neurological signs (including ataxia, behavioural and mentation changes, head tilt, circling, muscle fasciculations, recumbency, stranguria) predominate [1,2] Horses may be found dead without any prior demonstration of illness, and some horses have demonstrated signs of abdominal pain. Most horses die or are subjected to euthanasia within 48 hours of onset of clinical abnormalities, however some horses have demonstrated a more prolonged course of disease over several days and horses may occasionally survive acute infection [1,2]

HeV: Timeline and geographical distribution

Hendra virus (HeV) was first isolated in 1994 in a Thoroughbred stable in the suburb of Hendra, Brisbane, Queensland, when a Thoroughbred trainer and 14 horses succumbed to a rapidly progressive and fatal respiratory/neurological disease. Subsequently, there have been sporadic and unpredictable occurrences of HeV disease in horses. Up to 2010 there were 14 separate incidents, while in 2011 alone there were 18 outbreaks with involvement of 24 horses [3] Outbreaks continue to occur annually: most recently there have been outbreaks in the Australian autumn and winter of 2014.
To date, all HeV outbreaks have occurred in Queensland and New South Wales, despite the widespread distribution of the natural reservoirs, including the black flying fox (Pteropus alecto) and the grey-headed flying fox (P. poliocephalus) from Western Australia to Victoria and South Australia. The zoonotic potential of HeV is clear: to date, seven people have been infected with HeV after direct contact with infected horses, of which four died (including two veterinarians). An important implication for the veterinary profession is the emerging issue of the departure of veterinarians from equine practice as a result of HeV outbreaks and associated human health implications [4].

**HeV: Reservoir hosts**

Flying foxes are the reservoir host for HeV, however mechanisms of transmission within flying fox populations and infection of horses are not clear, although the virus is present in urine, fetal fluids and aborted flying fox pups. Despite an incomplete understanding of transmission methods, there is increasing evidence of epidemiological relationships between the environment, flying foxes and horses. Climatic, environmental and ecological changes, including urban habitation, likely result in seasonal forcing of HeV excretion and risk of transmission to horses [5-6]. Urban habitation and decreased flying fox migration from anthropogenic influences may reduce flying fox population immunity, greater risk of local virus reintroduction and activity, and with increasing direct/indirect contact of flying foxes with horses, greater risk of spill-over events and outbreaks of equine HeV infection. (6)

An additional epidemiological development of HeV was the detection of antibodies in a dog on a farm that had three HeV infected horses: this is the first report of antibody detection in a dog outside of an experimental setting [3]. The biological importance of this finding is difficult to determine, however it does raise the possibility that other species could be involved in the transmission of HeV.
**HeV: Recent advances in the control of infection in horses**

Eradication of HeV is not realistic due to maintenance in the fruit bat reservoir. A major advance for the prevention of HeV infection was the release of a commercial Hendra virus vaccine for use in horses under a special Minor Use Permit issued by the Australian Pesticides and Veterinary Medicines Authority in November 2012.

While the efficacy of the vaccination has not yet been established in field settings, experimental studies undertaken during vaccine development found vaccinated horses were protected from experimental challenge with HeV. Under the Minor Use Permit conditions, the vaccine can only be used by veterinarians, who must undertake online training. Further, horses must have a microchip inserted prior to vaccination and the microchip and vaccination details entered into a HeV Vaccine National Online Registry. Further, through vaccination of horses, a public health benefit is hope to be realised through reduced risk of HeV exposure of horse owners, veterinarians and other personnel involved in the horse industry.

**References**


**East Anglia**

A total of 40 cases were examined including nine aborted fetuses and fetal membranes.

Of the aborted fetuses examined, Equine Herpes Virus-1 (EHV-1) was detected in one case and placentitis was identified in the other case. There were four cases of umbilical cord torsion and a case of placentitis. The cause of abortion could not be determined in two cases.

Thirteen neonatal deaths were reported, three presented with sepsis, five cases were related to dystocia and three presented with congenital malformations. Single cases of neonatal isoerythrolysis and gastric rupture following a kick were also diagnosed.

A single case of foal death was investigated in which septicaemia and osteomyelitis was diagnosed.

One cardiac case was reported, in which a haemopericardium leading to cardiac tamponade was found.

Two musculoskeletal cases were examined, both of them pelvic fractures.

Five neurological cases were reported. Two traumatic events that lead to spinal compression were reported, one in a colt that fell into a ditch and dislocated C1-C2 vertebrae and the second related to a fall in the field. Wobbler syndrome was investigated in a filly and spinal compression was localised in between C6-T1. Single cases of segmental osteomyelitis secondary to a displaced fracture of T13 and multifocal lymphocytic ganglioneuritis of T2 nerve root.

One neoplasia case was reported, in which a mesenchymal tumour was found.

Seven horses were examined following gastrointestinal disease; single cases of sand impaction, colic of unknown origin with a distended caecum and chronic enterocolitis related to parasitic infection were reported. Two cases of equine grass sickness and two cases of haemorrhagic colitis were also diagnosed.

One horse was investigated for cholangitis and cholelithiasis.

**Home Counties**

Seventeen cases were reported.

A single case of neonatal death was examined; multiple ribs fractures secondary to dystocia were found.

Six cases of gastrointestinal disease were reported. Two cases of strangulated lipoma were diagnosed. Single cases of cyathosminiasis, chronic grass sickness, non-specific colitis and suspected clostridial colitis were also reported.

Two case of neurological disease were examined, in which cerebral haemorrhage in the parietal glove and cervical spondylopathy were determined respectively.
Four musculoskeletal cases were examined, all of them fractures; a shoulder dysplasia and subsequent fracture of the glenoid tuber and three horses with skull fractures were examined.

Three welfare cases were reported, two of them related to cyathostominosis and one case of facial deformity due to an overtight headcollar.

**Northern England**

*No Post Mortem examinations were reported this quarter.*

**South West**

*Two cases were examined.*

Two respiratory cases were reported, pneumonia was found in the first one and nodular masses in the lung in the second one, although no histopathology was performed in order to clarify the nature of the neoplasia.

**Scotland**

*Nineteen post-mortem examinations were carried out.*

A cardiac case was examined in which an aortic rupture was found.

Thirteen gastrointestinal cases were reported. Single cases of colitis due to cyathostomes, hypomotility colic of unknown origin, intussusception, strangulating lipoma and abdominal abscess were reported. Two cases of gastric rupture with secondary peritonitis and six cases of grass sickness were also examined.

Two hepatic cases were examined; pyrrolizine alkaloid toxicity and hepatopathy were diagnosed respectively.

One musculoskeletal case was reported, white muscle disease with pulmonary oedema and pleural and pericardial effusions were found.

Two cases of neoplasia were examined in which a haemangiosarcoma and a squamous cell carcinoma (carcinomatosis) were identified respectively.

**Northern Ireland**

*Four cases were reported.*

One hepatic toxicosis case was examined. Hepatic toxicosis was suspected although testing is still ongoing.

One respiratory case was reported in which a miniature horse suffered suffocation after being kicked by another horse causing a broken hyoid bone.

One mare was found with uterine prolapse and subsequent rupture of the uterine artery and the last case was reported in a foal with suspected clostridial endotoxaemia.
ACKNOWLEDGEMENTS

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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 Health and Veterinary Laboratory 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 Veterinary Group
Endell Veterinary Group Equine Hospital
Hampden Veterinary Hospital
Hampton Veterinary Group Laboratory
IDEXX Laboratories
JSC Equine Laboratory
Lab Services Ltd
Liphook Equine Hospital
Minster Equine Veterinary Clinic
Newmarket Equine Hospital
Oakham Veterinary Hospital
The Donkey Sanctuary
The Royal Veterinary College
Three Counties Equine Hospital
Torrance Diamond Diagnostic Services (TDDS)
University of Bristol, Department of Pathology
University of Edinburgh
University of Glasgow
Valley Equine Hospital

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

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