Highlights in this issue:

- Focus Article - Equine Influenza Diagnosis

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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Welcome to the first quarterly equine disease surveillance report for 2017 produced by Department for Food, Environment and Rural Affairs (Defra), British Equine Veterinary Association (BEVA), Animal & Plant Health Agency (APHA) and the Animal Health Trust (AHT).

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

**Current national and international disease outbreaks from 1st April 2017**

**National Disease Occurrence**

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

On 9th May and 16th May 2017, Rossdales Laboratories confirmed two case of EHV-1 abortion on a stud premises in Berkshire. The affected animals were vaccinated mares, of which one was grouped with six other pregnant mares and one with twelve pregnant mares. These two cases had not been in direct contact with each other or the index case. Appropriate biosecurity measures, in accordance with HBLB Codes of Practice, have been implemented and will continue as required. The positive diagnoses were confirmed by post mortem examination and qPCR on fetal and placental tissues. As of 2nd June 2017, no further cases have been confirmed.

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

On 31st May 2017, Rossdales Laboratories confirmed a case of EHV-1 neurological disease affecting a non-vaccinated, four-year-old Thoroughbred gelding on a racing premises in Yorkshire, England. The affected animal presented with hindlimb oedema, pyrexia and loss of vision and was subsequently euthanased on 29th May 2017. This animal was in direct contact with 14 other animals and there are a total of 150 animals on this premises. Appropriate biosecurity measures, in accordance with HBLB Codes of Practice and under instruction from the British Horseracing Authority (BHA) have been implemented and will continue as required. The positive diagnosis was confirmed by qPCR on an antemortem nasopharyngeal swab, and upper respiratory muscosa, lymph node, brain and spinal tissues sampled on post mortem examination.

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

During April, the Animal Health Trust (AHT) confirmed a case of EHV-1 respiratory disease on premises in Roxburghshire. The affected animal was an unvaccinated four year old Thoroughbred gelding, with a history of pyrexia, inappetance and filled distal hindlimbs. Two in-contact animals have displayed similar clinical signs. There are a total of 18 animals on these premises, of which 15 have also suffered from poor performance. The positive diagnosis was confirmed by qPCR on a nasopharyngeal swab.

**EQUINE HERPES VIRUS–4 (EHV-4) RESPIRATORY DISEASE**

On 12th April 2017, the AHT confirmed a single case of EHV-4 on premises in Derbyshire. The affected animal was a six-year-old unvaccinated female. The positive diagnosis was confirmed by qPCR on a nasopharyngeal swab.
EQUINE INFLUENZA (EI)

On 10th May 2017, the AHT confirmed a case of EI on premises in Yorkshire. The affected animal was a three-year-old unvaccinated colt. The positive diagnosis was confirmed by qPCR on a nasopharyngeal swab.

International Disease Occurrence

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

Belgium
On 25th April 2017, Equi Focus Point, Belgium (EFPB) reported a case of EHV-1 abortion on premises in the Aalst region, Belgium. The affected animal was vaccinated. The positive diagnosis was confirmed on 17th April 2017 by PCR on fetal tissues.

France
On 7th April 2017, Réseau d’Epidémio-Surveillance en Pathologie Equine (RESPE) reported a single case of EHV-1 abortion on a stud premises in Calvados, France with 100 animals. The affected animal was a non-vaccinated Thoroughbred mare. The positive diagnosis was made by PCR on fetal tissues.

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

France
During April 2017, an outbreak of EHV-1 neurological disease occurred on a Thoroughbred racing premises in Pau, France. The four affected animals were stabled within the same barn and were within a group of 56 animals. There was no reported evidence of disease spread external to this barn. Biosecurity measures implemented under France Galop included permitting animals from the non-infected barns to continue to race in France, advising for clinical examinations in quarantine upon arrival at the racecourse for animals from this affected premises. France Galop liaised during this outbreak with the BHA on the disease situation, and the protocols implemented. On this basis, the BHA allowed for animals from the non-infected barn to race in the UK.

USA
During April and May, three separate cases of EHV-1 neurological disease have been confirmed in Colorado, Florida and New Jersey. Quarantine restrictions were implemented on all three premises, of which restrictions remain in place for one.

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

France
During April and May, RESPE reported one single case and one outbreak of EHV-1 respiratory disease. The outbreak involved seven cases.

Belgium
During April, EFPB reported three separate cases of EHV-1 respiratory disease. Animals presented with coughing, nasal discharge and pyrexia. The positive diagnoses were confirmed by qPCR on nasopharyngeal swabs.

EQUINE INFECTIONOUS ANAEMIA (EIA)

USA
On 4th May 2017, a case of EIA was confirmed in a five-year-old racing Quarter horse in Fort Lupton, Colorado. The mare which was asymptomatic was euthanased. The index premises is a stable with a total of 18 horses all of which are under quarantine restrictions that will remain in place for not less than 60 days.
LEPTOSPIRA ABORTION

France
On 10th April 2017, RESPE reported a case of leptospira abortion that occurred on a stud premises in Eure, France. The affected animal was a six-year-old Thoroughbred that aborted on 5th April 2017. The positive diagnosis was confirmed by PCR on fetal tissues.

Neospora caninum ABORTION

Belgium
On 6th April 2017, EFPB reported a case of Neospora caninum abortion on premises in Balen, Belgium. This affected animal aborted on 21st March 2017. The positive diagnosis was confirmed on 4th April 2017 by PCR on fetal brain tissues. No further details are currently available.

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

In this report we are pleased to include a focus article on Equine Influenza Diagnosis by Adam Rash PhD, Animal Health Trust. During the summer months, there will be an increased movement and therefore mixing of the horse population, leading to a higher risk of disease transmission and resultant clinical cases therefore, it is important for both vets and owners to remain vigilant for Influenza infection. 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 January to March 2017 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, EIA and WNV). APHA now also provides testing for WNV as part of clinical work up of neurological cases, to exclude infection 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 2017

<table>
<thead>
<tr>
<th>Serological Tests</th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
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<tbody>
<tr>
<td>EVA ELISA</td>
<td>6892</td>
<td>113</td>
<td>9</td>
</tr>
<tr>
<td>EVA VN</td>
<td>1064</td>
<td>219#</td>
<td>3</td>
</tr>
<tr>
<td>APHA EVA VN</td>
<td>443</td>
<td>12#</td>
<td>1</td>
</tr>
<tr>
<td>EHV-1/-4 CF test</td>
<td>393</td>
<td>3*</td>
<td>2</td>
</tr>
<tr>
<td>EHV-3 VN test</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>ERV-A/-B CF test</td>
<td>174</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Influenza HI test</td>
<td>230</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>EIA (Coggins)</td>
<td>998</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>EIA ELISA</td>
<td>5920</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>APHA EIA (Coggins)</td>
<td>731</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA WNV (cELISA)</td>
<td>0</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>Coronavirus PCR</td>
<td>49</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>EHV-1/-4 PCR</td>
<td>720</td>
<td>28</td>
<td>6</td>
</tr>
<tr>
<td>EHV-2/-5 PCR</td>
<td>25</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Influenza NP ELISA</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Influenza Directigen</td>
<td>27</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza PCR</td>
<td>233</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>APHA Influenza PCR</td>
<td>163</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Influenza VI in eggs</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>EHV VI</td>
<td>48</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>EVA VI/PCR</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA EVA VI/PCR</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>29</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

ELISA = enzyme-linked immunosorbent assay, VN = virus neutralisation, 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 # = Seropositives include vaccinated stallions, * = Diagnosed positive on basis of seroconversion between paired sera virus, EIA = equine infectious anaemia, WNV = West Nile Virus
EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

On 24th March 2017 Rossdales Laboratories reported a case of EHV-1 abortion on premises in Worcestershire. The affected animal was a vaccinated Thoroughbred mare with no other in-contact pregnant mares. The positive diagnosis was confirmed by qPCR on fetal tissues.

On 22nd March 2017, the AHT confirmed a case of EHV-1 abortion on a stud premises in Bedfordshire, England. The affected animal was an eight-year-old vaccinated Thoroughbred mare that was grouped with three other mares on the premises. Appropriate biosecurity measures, in accordance with HBLB Codes of Practice, were implemented and continued as required. The positive diagnosis was confirmed by post mortem examination and qPCR on fetal and placental tissues.

On 20th February 2017, the AHT confirmed a case of EHV-1 abortion on a stud premises in Gloucestershire. The affected animal was a vaccinated Thoroughbred mare, in direct contact with youngstock only. The positive diagnosis was confirmed by qPCR on fetal tissues.

On 10th February 2017, the AHT reported a case of EHV-1 abortion on premises in Suffolk. The affected animal was an 11-year-old vaccinated Thoroughbred mare at nine months gestation. This case was in contact with one gelding only. The positive diagnosis was confirmed by Rossdales Laboratories on 7th February 2017 on post-mortem examination, histopathology and qPCR on fetal and placental tissues.

On 6th January 2017, the AHT confirmed a case of EHV-1 abortion on private premises in the west of England. The affected animal was a non-vaccinated, 10-year-old maiden foaling Thoroughbred mare and the only pregnant animal on the premises. The positive diagnosis was confirmed by qPCR on placental tissue.

On 5th January 2017, the AHT confirmed a secondary case of EHV-1 abortion that occurred on 4th January 2017 on a stud premises in Cambridgeshire, England. The affected animal was a non-vaccinated Thoroughbred mare. The index case aborted on 27th December 2016 and this secondary case was in direct contact with one other pregnant mare. Appropriate biosecurity measures, in accordance with HBLB Codes of Practice, were implemented and continued as required. The positive diagnosis was confirmed by qPCR on placental and fetal tissues.

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

On 6th March 2017, the AHT confirmed a case of EHV-1 neurological disease affecting a non-vaccinated, 19-year-old Thoroughbred-cross mare on a small private yard with five horses in Bedfordshire, England. The affected animal presented with hindlimb ataxia and oedema and loss of tail tone on 5th March 2017, which followed mild respiratory signs and pyrexia approximately a week previously. The positive diagnosis was confirmed by PCR on a nasopharyngeal swab. The yard was closed with clinical and laboratory testing conducted to indicate no further evidence of recent infection.

On 1st March 2017, the AHT reported a presumptive case of EHV-1 neurological disease affecting a non-vaccinated, eight-year-old gelding on a livery yard in Worcestershire, England. The affected animal presented with ataxia and had arrived on the premises approximately one month previously. The presumptive diagnosis was made on the basis of raised serum antibody titres against EHV-1 and EHV-4 using the complement fixation test (CFT), with no history of recent vaccination. The yard was closed with clinical and laboratory testing conducted to indicate no further evidence of recent infection.

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

On 22nd February 2017, the AHT confirmed a case of EHV-1 respiratory disease on premises in Staffordshire. The affected animal was an unvaccinated three year old filly, with a history of coughing, mucopurulent nasal discharge and pyrexia.
On 20th February 2017, the AHT confirmed a case of EHV-1 respiratory disease on premises in Lancashire. The affected animal was an unvaccinated Warmblood yearling, with a one month history of coughing and nasal discharge. This animal was in direct contact with six other animals on the premises, none of which have shown clinical signs.

On 6th January 2017, the AHT confirmed a case of concurrent strangles and EHV-1 respiratory infection in a 26-year-old gelding on a riding establishment in South Lanarkshire, Scotland. The affected animal had shown signs of pyrexia, inappetance, mucopurulent nasal discharge, enlarged lymph nodes and conjunctivitis since 30th December 2016.

For all of the above cases, the positive diagnoses were confirmed by qPCR on nasopharyngeal swabs.

**EQUINE HERPES VIRUS-4 (EHV-4) ABORTION**

On 28th March 2017, the AHT confirmed a case of EHV-4 abortion on premises in Dorset, England. The affected animal was a four-year-old unvaccinated Connemara mare, in direct contact with one other pregnant mare. The positive diagnosis was confirmed by qPCR on fetal and placental tissues.

**EQUINE HERPES VIRUS-4 (EHV-4) RESPIRATORY DISEASE**

On 16th March 2017, the AHT confirmed a case of EHV-4 respiratory disease affecting a four-year-old Warmblood mare that presented with lymphadenopathy and mucopurulent nasal discharge. The positive diagnosis was confirmed by PCR on a nasopharyngeal swab.

**EQUINE INFLUENZA (EI)**

On 28th March 2017, the AHT confirmed a case of EI on premises in Gloucestershire. The affected animal was an unvaccinated five-year-old Warmblood gelding that presented with pyrexia and mucopurulent nasal discharge on 16th March 2017. With this clinical presentation, the horse was immediately placed into isolation and has since recovered. The positive diagnosis was confirmed on 28th March 2017 under the HBLB Influenza Surveillance Scheme, using the haemagglutination inhibition (HI) test which indicated seroconversion on paired serology.

**Influenza Tell-Tail Alert**

In the case of an outbreak, notification will be reported by the text alert service (Tell-Tail) for UK equine practitioners sponsored by Merial Animal Health. This free of charge service alerts practitioners to outbreaks of equine influenza in the UK via text message.

**NEW: EHV-1 Tell-Tail Alert**

Tell-Tail alerts have expanded to include notifications of EHV-1 Neurological Disease and EHV-1 Abortion.

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 surveillance scheme, please contact: equiflunet@aht.org.uk or follow the link to [www.equiflunet.org.uk](http://www.equiflunet.org.uk) for more information on equine influenza.
**AFRICAN HORSE SICKNESS (AHS)**

**South Africa**
In the first quarter of 2017, outbreaks of AHS were confirmed in all Provinces in South Africa except in the Eastern Cape and the Western Cape. No cases occurred within the AHS controlled area of South Africa in the Western Cape Province. Cases of AHS in the infected area are as expected for this period of time.

**ARBOVIRUSES**

**South Africa**
Between January and March 2017, an increase in Middleburg and West Nile virus (WNV) positives were detected from across South Africa relative to 2016, through an ongoing surveillance scheme managed by the University of Pretoria's Emerging Vector borne and respiratory virus programme, Centre for Viral Zoonosis, Department of Medical Virology. A total of 22 WNV cases and 30 Middleburg cases were detected, with one co-infection. Most cases of WNV and Middelburg virus were detected in the Gauteng Province. Diagnostic testing includes realtime RT PCR tests for flavivirus and alphaviruses with specific probes for WNV, Wesselsbron, Middelburg and Sindbis viruses and specific PCRs for Shunivirus and Equine Encephalitis virus. Serology for WNV includes an IgM ELISA with confirmatory neutralisation assays. Veterinarians from across the country submit samples from neurological cases they encounter throughout the year.

**CLOSTRIDIAL DISEASES**

**USA**
A small number of cases of enteritis associated with *Clostridium difficile* Type A toxin genotype or Type B toxin genotype or *C. perfringens* Type A toxin genotype were reported in foals. Single cases of Tyzzer’s Disease caused by *C. piliformis* and *C. novyi* were confirmed.

**EQUINE ENCEPHALOSIS (EE)**

**South Africa**
Testing for Equine Encephalitis is frequently done in conjunction with AHS testing in South Africa. Cases of EE were confirmed in Gauteng and Mpumalanga during the first quarter of 2017. This is not as widespread as the equivalent time in previous years.

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

**Belgium**
During February and March, EFPB reported two separate cases of EHV-1 abortion. Neither animal was vaccinated. The positive diagnoses were confirmed on 17th March 2017 by PCR on fetal tissues.

**France**
On 11th January 2017, three new cases of EHV-1 abortion were confirmed in Pas-de-Calais, on a Saddlebred stud farm. The outbreak commenced on 28th December 2016 with two secondary cases confirmed on 30th December 2016.

Single, unlinked cases occurred in Seine-et-Marne, Nièvre and Manche during February and in Loire, Pas-de-Calais and Sarthe during March.

For all of the above cases, the positive diagnoses were confirmed by PCR on fetal and placental tissues.
On 31st March 2017, a case was confirmed in Sarthe in a vaccinated nine-year-old French Trotter. The diagnosis was confirmed by PCR on a uterine swab. On 10th April 2017, a secondary case was confirmed on the same premises in a vaccinated 17-year-old French Trotter. Five other mares on the stud farm have also aborted.

Japan
EHV-1 abortion was diagnosed in 11 Thoroughbreds on seven separate premises between 3rd January 2017 and 27th March 2017. Positive diagnoses were confirmed by PCR conducted by Hokkaido Hidaka Livestock Hygiene Service Center. Nine of the animals were vaccinated.

USA
A total of four cases of EHV-1 abortion were diagnosed in Kentucky.

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

Belgium
On 21st February 2017, Equi Focus Point, Belgium (EFPB) reported a single case of EHV-1 neurological disease. This affected animal was not vaccinated and presented with ataxia and hindlimb oedema on 17th February 2017. The positive diagnosis was confirmed on 21st February 2017 by PCR on whole blood.

Canada
On 17th March 2017, a significant outbreak of EHV-1 neurological disease was reported by the Manitoba Horse Council. The disease was first noted three weeks earlier on the premises in south western part of the Province at which time the attending veterinarian(s) imposed strict quarantine restrictions on the 105 horses on the property. At the time of reporting, there were eight fatalities from neurological disease with an additional two horses showing neurological signs. Strict biosecurity measures were enforced until there was no further evidence of recent infection.

France
On 27th February 2017, a case of neurological disease was confirmed in Pas-de-Calais. The positive diagnosis was confirmed by PCR on a blood sample.

USA
Single cases of neurological disease were reported in Louisiana, Michigan, and Oregon and two cases were reported in California. An outbreak at the New Orleans Fairgrounds Racetrack involved eight cases. Some of these cases were associated with strains of the ORF30 A2254 genotype ('non-neuropathogenic'), others with strains of the ORF30 G2254 genotype ('neuropathogenic').

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

Belgium
EHV-1 respiratory disease was confirmed in six horses on separate premises during the first quarter of 2017. Three of these animals were vaccinated. Positive diagnoses were confirmed by PCR on nasopharyngeal swabs.

France
During March 2017, three separate cases of EHV-1 respiratory disease were confirmed on premises in Pas-de-Calais, Bas-Rhin and Nièvre. The positive diagnoses were confirmed by PCR on nasopharyngeal swabs.

Germany
EHV-1 respiratory disease was confirmed in two horses on two separate premises during the first quarter of 2017. Positive diagnoses were confirmed by PCR on nasopharyngeal swabs.

Ireland
Seven cases of EHV-1 were reported during the first quarter of 2017 in the following counties, Carlow (one case), Kildare (two cases), Limerick (one case), Meath (one case), Wexford (one case) and Tipperary (one case). No further details were made available.
EQUINE HERPES VIRUS-4 (EHV-4) ABORTION

France
On 3rd March 2017, a case of EHV-4 abortion was confirmed in a six-year-old non-vaccinated Andalusian. The positive diagnosis was made by PCR on fetal organs.

EQUINE HERPES VIRUS-4 (EHV-4) RESPIRATORY DISEASE

Belgium
EHV-4 respiratory disease was reported in one animal on 3rd March 2017 by EFPB. The positive diagnosis was confirmed by PCR on a nasopharyngeal swab.

France
Eight outbreaks of EHV-4 respiratory disease have been confirmed (six outbreaks with one case, one outbreak with two cases and one outbreak with three cases) in Ain, Calvados, Loire-Atlantique, Orne and Pas-de-Calais. Affected horses showed clinical signs of pyrexia, nasal discharge and lethargy. For all of these outbreaks, positive diagnoses were confirmed by PCR on nasopharyngeal swabs.

Germany
EHV-4 respiratory disease was confirmed in six horses on four separate premises during the first quarter of 2017. Positive diagnoses were confirmed by PCR on nasopharyngeal swabs.

EQUINE INFECTIOUS ANAEMIA (EIA)

Germany
On 11th January 2017 the Friedrich Loeffler Institute confirmed a clinical case of EIA on premises in Landkreis Amberg-Sulzbach, Bavaria. One horse out of five susceptible animals on the premises tested positive by an agar gel precipitation (AGP) test. The affected animal was euthanased and quarantine measures, including movement restrictions and the screening of all animals resident in the quarantine zone, have been implemented. In the course of the control measures, the Regional Reference Laboratory in Erlangen confirmed two further subclinical cases of EIA in Landkreis Amberg-Sulzbach, Bavaria on 19th January 2017. They were tested positive by agar gel precipitation (AGP) test. The source of the outbreak is still unknown.

Canada
Between 1st January 2017 and 31st March 2017, a total of ten EIA positive equines were identified in the provinces of Quebec (one case) and Saskatchewan (nine cases). The positive animals were identified on five separate premises; one in Quebec and four in Saskatchewan.

All four of the affected Saskatchewan premises were epidemiologically linked and severe clinical disease was reported on the index premises. Each of the premises in Saskatchewan had been involved in previous Canadian Food Inspection Authority (CFIA) EIA investigations and disease control actions, including testing contacts and ordering humane destruction of positive cases, was undertaken.

USA
Illinois reported two cases of EIA both on the same premises.

EQUINE INFLUENZA (EI)

USA
Equine influenza is endemic in the USA. Disease outbreaks were confirmed in four states, the majority involving multiple cases of the disease.

EQUINE VIRAL ARTERITIS (EVA)

Argentina
Imported semen from an Arabian stallion was detected positive to EVA during pre-import quarantine thus ensuring Argentina remains EVA free. The confirming laboratory was INTA Castelar with the positive diagnosis confirmed by agent isolation and reverse transcriptase (RT) PCR.
USA

Eleven cases of nocardioform placentitis associated with *Amycolatopsis* spp and/or *Crossiella equi* infection were confirmed in Kentucky.
**Title:** Equine Influenza diagnosis  
**Adam Rash PhD, Animal Health Trust**

**Virus Classification:** Family: Orthomyxoviridae Group: V, negative-sense, single-stranded (ss) RNA

**Transmission:** Direct and indirect contact

**Clinical signs if:**
1. **Vaccinated:** wide range of non-specific respiratory signs, with or without depression  
2. **Unvaccinated:** harsh, dry cough, pyrexia, depression and mucoid nasal discharge

**Laboratory Diagnosis:**
1. qPCR on nasopharyngeal swabs  
2. Haemagglutination inhibition (HI) serological test on paired samples (acute and convalescent)  
3. Virus isolation and characterization (for positive samples)

**Geographic Distribution:** Endemic worldwide

**Control:** Regular vaccination and surveillance. In the event of an outbreak, movement restrictions, barrier nursing, hand washing, clinical monitoring and sampling of in-contact animals to identify clusters of infection.

**Notifiable:** No

Equine influenza virus (EIV) is a major cause of acute respiratory disease in horses and other equids worldwide. It is highly contagious spreading rapidly between naïve animals, but can also affect vaccinated animals. Typical clinical signs include pyrexia, a harsh dry cough, serous or mucopurulent nasal discharge and in some cases lethargy and loss of appetite.

The disease is caused by influenza A virus, a member of the orthomyxovirus family, which has a negative-sense single-stranded RNA genome. Prior to 1963, all EIV isolates belonged to the H7N7 subtype, whilst currently circulating viruses belong to the H3N8 subtype. H7N7 EIV has not been isolated for 30 years and is therefore thought to be extinct. Since the first isolation from horses of an H3N8 virus this subtype has diverged into different lineages and sub-lineages. In recent years the Florida sub-lineage has become the dominant circulating group. Florida clade 1 (FC1) viruses have predominantly been isolated in North America, whilst the majority of Florida clade 2 (FC2) viruses have been isolated in Europe and Asia. The World Organisation for Animal Health (OIE) recommends that an example of each clade is included in commercial vaccines.
Diagnostic tests
EIV infection can be confirmed either by detecting the virus itself from a nasopharyngeal swab sample taken during the acute phase of infection, or retrospectively by seroconversion between paired blood samples – one sample taken during the acute phase and the second during the convalescent phase.

To maximize the chances of obtaining sufficient virus, nasopharyngeal samples need to be taken as early as possible after clinical signs first appear. If it is too late to swab the affected horse it can still be fruitful to take swabs from in contact animals as shedding begins before clinical signs manifest. Paired plain bloods can be taken further into the disease process because an increase in antibody titre can still be detected even if virus excretion is too low to detect with a swab. To obtain a meaningful diagnosis two samples not less than two weeks apart are always required.
Virus detection
Infected horses begin to shed virus before showing signs of disease. Unvaccinated horses will typically shed more virus, and for longer, than vaccinated horses. If a nasopharyngeal swab sample is taken from the horse during this shedding phase then viral RNA can be detected using a qPCR assay, confirming EIV infection.

One characteristic of RNA viruses is that they accumulate mutations within their genome when undergoing replication. This can have implications on diagnostic tests that detect the viral RNA because these mutations could occur in the region specifically targeted by the assay and ultimately could prevent the test from working. The qPCR assay that the AHT EIV Surveillance Scheme uses to detect EIV is designed to identify two of the virus genes, nucleoprotein (NP) and matrix (M). It has been chosen to target these genes as they are relatively conserved between virus strains, therefore not accumulating as many mutations as some of the other genes, for example, the haemagglutinin (HA) and neuraminidase (NA) genes that encode the surface glycoproteins. It is also unlikely that mutations would occur in both the NP and M genes at the same time. Including both in our assay therefore increases the chance of detecting viral RNA in a sample.

As part of the AHT EIV surveillance programme we analyse the NP and M gene sequences from all of the viruses that we isolate in the UK, as well as those from around the world to ensure that our diagnostic qPCR assay remains fit for purpose.

Other subtypes and reassortment
It is thought that the H3N8 virus that causes equine influenza originated in aquatic birds in South America and its emergence in horses followed a species jump in the late 1950s/early 1960s. Cross-species transmission events like this are rare, however we know that they have occurred between birds and horses several times in the past, so the emergence of another subtype in horses is possible. To ensure that the AHT qPCR would detect a new subtype the M gene qPCR was adapted from an assay developed to detect type A influenza viruses in birds. This assay detects the M gene from different subtypes of influenza A virus, whilst the NP component of the qPCR test has been designed to specifically target equine H3N8 viruses. By using both the M and NP targets in the qPCR assay any influenza A virus would be detected and could quickly identify if a new subtype had emerged in horses.

Reassortment, where gene segments are exchanged between two different co-infecting viruses, can also occur. This was observed in 2009 when whole genome sequencing revealed that the FC1 viruses isolated in the UK that year also contained FC2 gene segments, meaning that at some point one or more horses were infected with both clades at the same time. Despite having a mix of FC1 and FC2 genes, these viruses were classified as FC1 viruses because the phylogeny is based on the sequence of the HA gene. Reassortment can also occur between influenza A viruses from different species, which is what lead to the ‘quadruple-reassortant’ virus that caused the 2009 H1N1 pandemic in humans.

The cost of next generation sequencing (NGS) has reduced dramatically in recent years and is increasingly being used to sequence new virus isolates. As the whole virus genome is automatically sequenced using NGS, evidence of reassortment can be observed without having to target specific genes (and subtypes) using conventional PCR and sequencing methods. Another benefit of NGS is deep-sequencing which can detect mutations present in a virus sample, even at low levels. This ability is important as it allows for the early detection of variants emerging in the field.

Serology
As horses will shed virus before showing clinical signs and may shed for only a short period of time, it is important to also collect a blood sample when taking a nasopharyngeal swab sample during the acute phase of infection. If the shedding window has been missed then the swab sample may test negative, however virus infection can still be confirmed by serology. The test is comparative so the acute sample needs to be taken as early as possible and a convalescent sample taken any time from two weeks later.
In the absence of recent vaccination, a fourfold rise (seroconversion) in antibody titre between the acute and convalescent samples will confirm recent virus infection.

**Figure 3:** Example of a seroconversion indicating recent infection with H3N8 viruses. There is a 16-fold rise in antibody titre in an animal with no history of recent vaccination.

<table>
<thead>
<tr>
<th></th>
<th>Day 1 1st Sample</th>
<th>Day 14 2nd Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equine Influenza H7N7 - Prague ‘56 Antibody</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Equine Influenza H3N8 - Miami ‘63 Antibody</td>
<td>16</td>
<td>256</td>
</tr>
<tr>
<td>Equine Influenza H3N8 - Nmkt ‘93 Antibody</td>
<td>16</td>
<td>256</td>
</tr>
</tbody>
</table>

Test reading titres: 0, 16, 32, 64, 128, 256, 512, 1024, >1024 (maximum dilution at which antibody is detected)

Although no longer required, some vaccines still contain an H7N7 antigen. This can be useful when interpreting serological test results by differentiating infection from vaccination (DIVA). In this scenario (where a vaccine containing H3N8 and H7N7 antigens had been used) a seroconversion on paired blood samples to both H7N7 and H3N8 antigens would suggest recent vaccination, whereas seroconversion to just H3N8 antigens would suggest recent infection. However, to enable DIVA the full vaccination history of the horse, including the vaccines used, is essential.

**Equine influenza surveillance**

The equine influenza surveillance scheme at the AHT was set up to monitor genetic and antigenic changes in equine influenza viruses circulating in the UK. The HBLB sponsor this surveillance scheme which also provides free advice and free diagnostic testing for equine influenza to all practices registered with the scheme. It also provides a means for us to communicate rapidly with veterinary practitioners in the face of an outbreak. The information collected from nasopharyngeal swabs and paired blood samples allows us to compare currently circulating viruses with those used in commercial vaccines. This data is used to determine whether current vaccine strain recommendations should be updated or not.

To find out more about the surveillance scheme, and to register, please visit [www.equiflunet.org.uk](http://www.equiflunet.org.uk)
A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Table 2. For Contagious Equine Metritis (CEM), all of the 22 HBLB approved laboratories in the UK contributed data.

**Table 2: Diagnostic bacteriology sample throughput and positive results for the first quarter 2017**

<table>
<thead>
<tr>
<th></th>
<th>Number of Samples Tested</th>
<th>Number Positive</th>
<th>Number of Contributing Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEM (HBLB) PCR</td>
<td>1496</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>CEMO (HBLB) culture</td>
<td>10558</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>CEMO (APHA) PCR</td>
<td>13</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>CEMO (APHA) culture</td>
<td>1011</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em> PCR</td>
<td>1496¹</td>
<td>0#</td>
<td>7</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em> culture</td>
<td>11674¹</td>
<td>17*</td>
<td>23</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em> PCR</td>
<td>543¹</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em> culture</td>
<td>11602¹</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td>Strangles* culture</td>
<td>954</td>
<td>78</td>
<td>20</td>
</tr>
<tr>
<td>Strangles* PCR</td>
<td>1518</td>
<td>123</td>
<td>6</td>
</tr>
<tr>
<td>Strangles ELISA²</td>
<td>3323</td>
<td>306</td>
<td>5</td>
</tr>
<tr>
<td>Salmonellosis</td>
<td>624</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>APHA Salmonellosis²</td>
<td>22</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>MRSA**</td>
<td>317</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>140</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Clostridium difficile</td>
<td>163</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Borrelia (by ELISA)</td>
<td>13</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Rhodococcus equi</td>
<td>20</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>(culture/ELISA/PCR or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>immunochromatography)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APHA Burkholderia mallei</td>
<td>399</td>
<td>0#</td>
<td>1</td>
</tr>
<tr>
<td>(Glanders)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lawsonia intracellularis</td>
<td>173</td>
<td>81</td>
<td>9</td>
</tr>
<tr>
<td>culture/PCR</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CEM = contagious equine metritis (Taylorella equigenitalis); HBLB = HBLB accredited laboratories; # = capsule type 1,2,5; *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; ²seropositivity may be attributed to disease exposure, vaccination, infection and carrier states. ³Under the Zoonoses Order 1989, it is a statutory requirement to report and serotype positive cases for Salmonella spp. A positive case may have repeat samples taken. ⁴Two non-negative Glanders CFT results were disclosed from horses for export that had not travelled abroad previously. Statutory disease control restrictions were served, and official veterinary and laboratory investigations were conducted by APHA. Disease was not confirmed and restrictions were lifted.

**APHA CEM data for the period January to March 2017**

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

**Strangles**

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

**Burkholderia mallei (Glanders)**

Glanders is a notifiable disease in the UK. The APHA laboratory test used for pre-export testing in
live animals is the complement fixation (CF) test, which may occasionally produce low level non-negative results. These are followed up by an on-site official veterinary inquiry by the APHA, restrictions placed on the affected animal and further confirmatory testing to determine the health status of the animal. Any clinical suspicion of Glanders should be reported immediately to APHA: https://www.gov.uk/government/collections/notifiable-diseases-in-animals

During this first quarter, two non-negative Glanders CF test (CFT) results were disclosed from horses for export that had not travelled abroad previously. Due to the notifiable status of Glanders in the UK, this resulted in statutory disease control restrictions being served. Official veterinary and laboratory investigations were conducted by APHA. Disease was not confirmed and restrictions were lifted. Further information on Glanders can be found at: http://www.aht.org.uk/cms-display/DEFRA_AHT_BEVA_equine_reports.html

**APHA Salmonella results**

Twenty-two samples were submitted this quarter to the Animal and Plant Health Agency (APHA) and of these, eighteen were positive for Salmonella. From the incidents involving isolates typed by the APHA, the serovars/phagetypes reported were S. Typhimurium (6 samples; 3 DT41 and 3 RDNC1), S. Agama (3 samples), S. Infantis (2 samples), and single incidents of S. 4,12:i:-, S. 4,5,12:i:- DT193, S. Braenderup, S. Coeln, S. Durham, S. Newport and S. Paratyphi B variant Java. Salmonella Typhimurium DT41 is typically associated with wild birds whereas the monophasic S. Typhimurium strains 4,(5)12:i:- are primarily found in pigs and also cattle. S. Newport and S. Agama are often associated with badgers and S. Paratyphi B variant Java is likely to be associated with contaminated imported feed ingredients. The Salmonella Infantis isolates also showed resistance to furazolidone and therefore the likely source for these isolates is dogs fed raw pet food. For more information from APHA about Salmonella in Great Britain, please see the recently published 2015 Salmonella in livestock surveillance report https://www.gov.uk/government/publications/salmonella-in-livestock-production-in-great-britain-2015.

**INTERNATIONAL BACTERIAL DISEASE OCCURRENCE**

**Time period: 1st January to 31st March 2017**

**CONTAGIOUS EQUINE METRITIS (CEM)**

**Germany**

CEM was confirmed in eight horses on six separate premises during the first quarter of 2017. Positive diagnoses were confirmed by culture and/or PCR on genital swabs.

**South Africa**

In January 2017 a semen donor stallion tested positive for CEM in the Gauteng province during the routine screening programme for all breeding stallions. This was the first positive CEM case since 2013 and the bacterial strain was typed as the same strain as the 2011 outbreak. Measures to contain and treat the affected horses were immediately implemented and contact tracing has been underway under the supervision of the responsible state veterinarian. The current countrywide surveillance programme remains in place.

**South Korea**

The Korean Racing Authorities (KRA) conducted examination for CEM on 2,086 samples from Thoroughbred stallions and broodmares registered in the South Korean Studbook. Results showed that 20 of 2,086 samples tested positive (0.96%) by qPCR on venereal swabs. Positive horses were treated followed by further examination by QIA until three consecutively negative results were returned.
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 results for the first quarter 2017

<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>Grass Sickness</td>
<td>9</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Hepatic toxicoses</td>
<td>38</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Atypical myopathy/Seasonal Pasture Associated Myopathy</td>
<td>6</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 4: Diagnostic parasitology sample throughput and positive results for the first quarter 2017

<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>Ascarids</td>
<td>4160</td>
<td>118</td>
<td>18</td>
</tr>
<tr>
<td>Cyathostomes</td>
<td>285</td>
<td>45</td>
<td>11</td>
</tr>
<tr>
<td>Dictyocaulus</td>
<td>100</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Strongyles</td>
<td>4359</td>
<td>1963</td>
<td>21</td>
</tr>
<tr>
<td>Tapeworms (ELISA based testing)</td>
<td>276</td>
<td>112</td>
<td>7</td>
</tr>
<tr>
<td>Tapeworms (Faecal exam)</td>
<td>1908</td>
<td>35</td>
<td>11</td>
</tr>
<tr>
<td>Strongyloids</td>
<td>3863</td>
<td>224</td>
<td>17</td>
</tr>
<tr>
<td>Oxyuris equi</td>
<td>118</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Fasciola</td>
<td>287</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>Coccidia</td>
<td>341</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Cryptosporidia</td>
<td>90</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Theileria equi (cELISA)</td>
<td>74</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Babesia caballi (cELISA)</td>
<td>74</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (CFT)*</td>
<td>134</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (IFAT)**</td>
<td>122</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>APHA Theileria equi (cELISA)***</td>
<td>155</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (CFT)*</td>
<td>134</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (IFAT)**</td>
<td>121</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>APHA Babesia caballi (cELISA)***</td>
<td>154</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mites</td>
<td>256</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Lice</td>
<td>240</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Ringworm</td>
<td>341</td>
<td>46</td>
<td>18</td>
</tr>
<tr>
<td>Dermatophilus</td>
<td>83</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Candida</td>
<td>93</td>
<td>2</td>
<td>6</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, 1=all labs refer this test to a non-contributing laboratory
ATYPICAL MYOPATHY

Various countries
As of 28th April 2017, 144 clinical cases compatible with the diagnosis of atypical myopathy have been communicated to Liege University and to the RESPE. These cases were recorded in Belgium (18 cases), France (93 cases), Great-Britain (nine cases), The Netherlands (two cases), Ireland (two cases), Czech Republic (12 cases), Switzerland (one case) and Germany (seven cases).

To register to receive alert messages on atypical myopathy via the official website run by researchers at the University of Liege visit http://www.myopathie-atypique.be.

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.

There were a total of five cases of equine grass sickness (EGS) reported during the first quarter of 2017 (January - March). An equal number of cases were reported to the surveillance scheme in both January (n=2) and February (n=2), with one case in March.

Of the five EGS cases, three occurred in England and two in Scotland. One premises reported a known history of EGS with the previous case occurring on the same specific paddock.

The reported cases comprised two geldings, one mare and one stallion with a mean age of 10.7 (range 0.5 – 18) years. The affected breeds included native breeds (n=4/5) and a Thoroughbred cross (n=1/5).

Two cases were reported to have acute EGS, one was reported to have sub-acute EGS and two had chronic EGS, of which both were reported to have survived to date. Diagnostic information was provided for three cases, all were diagnosed based on veterinary assessment of clinical signs alone.

Please note that the Equine Grass Sickness surveillance scheme receives data from a wider population in comparison to the data presented in Table 3, alongside different diagnostic criteria being used.
The caseload of post-mortem examinations reported below have been obtained from three UK Veterinary Schools and four of the contributing laboratories to this report.

**East Anglia**

*A total of 56 cases were examined including 36 aborted fetuses and fetal membranes.*

Of the *aborted fetuses* examined, umbilical cord torsion was identified in twelve cases, placentitis in six cases, EHV-1 in three cases and premature placental separation in one case and two intrapartum stillbirths. Single cases examined identified the following; necrotizing pneumonia, partial atelectasis with alveolar and interstitial oedema, trauma during parturition, anencephaly with umbilical cord torsion, amnion rupture and ischaemic necrosis of the cervical pole. The exact cause of abortion could not be determined in six cases, however an infectious disease process was ruled out.

Seven cases of *neonatal death* were examined. Three cases were as a result of dystocia, two cases were due to dysmaturity, one case identified clostridial enteritis and one case identified haemorrhagic enterocolitis.

Five *cardiovascular* cases were examined, identifying subcutaneous and muscular haemorrhages in one case due to trauma, disseminated intravascular coagulation and septic shock in one case, a cardiac abnormality of the left ventricle with subsequent congested lung fields and pleural effusion in one case, intraabdominal haemorrhage in one case and acute rupture of the proximal right middle uterine artery in one case.

Three cases of *gastrointestinal disease* were examined, confirming a prolapse of the small colon through a rectal tear in one case, mural thickening, microabscessation and peritonitis in one case and a small colon torsion and associated strangulation due to a mesenteric lipoma in one case.

Two *musculoskeletal cases* were examined identifying right fore distal limb osteochondritis in one case and multiple gluteal abscessations likely due to foreign body penetration in one case. Here, *Streptococcus zooepidemicus* was identified as the causative agent.

Two cases of *neurological disease* were examined, identifying acute haemorrhagic myelopathy with necrosis and cavitation of the spinal cord (C5 - T2) and one case where the cause of death could not be determined.

The cause of *peri-anaesthetic death* could not be determined in one case.

**Home Counties**

*A total of 20 cases were examined.*

One *cardiovascular case* was examined, identifying congestion and haemorrhage consistent with cardiogenic shock, associated with doxycycline toxicity.

Twelve cases of *gastrointestinal disease* were examined, identifying single cases of, jejunal distension due to post-operative ileus, jejunal rupture with parasitic overburden, epiploic foramen entrapment with senile liver atrophy, small intestinal mesenteric rent entrapment, liver fibrosis consistent with ragwort toxicity and one finding of a haemoperitoneum due to a cranial mesenteric artery aneurysm, thrombosis and rupture from migration of Strongylus vulgaris. Two cases of jejunal volvulus, two cases of right dorsal colon displacement and two cases of gastric rupture were also identified.
A single case of neoplasia was examined, identifying a phaeochromocytoma with peri-renal haemorrhage.

A single case of neurological disease was examined due to idiopathic epilepsy.

Four cases were referred from the RSPCA to be examined, of which all were emaciated with a marked cyathostomin burden. Two of these cases had concurrent cranioventral bronchopneumonia.

The cause of peri-anaesthetic death could not be determined in one case.

**Northern England**

*One case was examined.*

A single cardiovascular case was examined, identifying splenomegaly and haemoabdomen.

**Scotland**

*Ten cases were examined.*

A single cardiovascular case was examined, identifying a mesenteric arterial haemorrhage. For this case, a spontaneous vascular accident was suspected. There was no evidence of verminous arteritis.

Six cases of gastrointestinal disease were examined, identifying single cases of gastric impaction, dorsal colon impaction, peritonitis, and jaundice. For two cases, caecal impaction and rupture were identified.

Two cases of neoplasia were examined, which identified a cranial mediastinal mass (thymic lymphoma) in one case and haemoabdomen with multiorgan neoplasia in one case. For the latter, haemangiosarcoma was suspected but not confirmed histologically due to severe autolysis.

A single case of respiratory disease was examined. This case had a recent history of guttural pouch empyema, with *Streptococcus zooepidemicus* identified, however this was not identified on necropsy. An oesophageal tear was also identified on examination, although there was uncertainty as to whether this was linked to respiratory disease.

**Southern England**

*One case was examined.*

A single case of respiratory disease was examined, identifying suppurative bronchopneumonia with pleuritis.

**Northern Ireland**

*Five cases were examined.*

Two aborted fetuses were examined, identifying EHV-1 infection in one case. The exact cause of abortion could not be determined in the other case however an infectious disease process was ruled out.

Three cases of gastrointestinal disease were examined, which identified peritonitis associated with ileal perforation and heavy infestation of *Anoplocephala perfoliata* at the ileocaecal junction in one case, and cyathostominosis in two cases.
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All laboratories contributing to this report operate Quality Assurance schemes, which differ between laboratories. However, all contagious equine metritis (CEM) testing reported was accredited by the Horserace Betting Levy Board (HBLB) with the exception of APHA, which acts as the reference laboratory.

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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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