The Equine Infectious Disease Service at the Animal Health Trust

A ‘Thoroughbred’ contribution to the nation’s equine health
Background and relevance to the Thoroughbred

- In 1979, UK Thoroughbreds suffered severe outbreaks of equine influenza among racehorses and EHV-1 abortions and neurological disease on stud farms.
- Review of these outbreaks led to creation of a Virology Unit at the Animal Health Trust (AHT) with on-going support provided by the Thoroughbred industry.
- Since then the AHT has grown its equine infectious disease research and diagnostic service capability.
- The AHT still receives financial support annually from owners and breeders of Thoroughbreds & the HBLB.
Background and relevance to the Thoroughbred

- AHT continues to fulfil a critical role through provision of specialist laboratory testing via its Diagnostic Microbiology and Pathology Laboratory Services.
- AHT also provides advice and guidance on disease control and prevention via its veterinary surgeons in the Epidemiology and Disease Surveillance Unit.
- Working with attending vets and governing authorities, the AHT strives to minimise the extent & impact of disease outbreaks by reducing the risk of onward transmission to other groups of horses.
Background and relevance to the Thoroughbred

- Thoroughbred industry financial support helps the AHT maintain expert staff, equipment & facilities, allowing:
  - Continual improvements to be made to a wide range of modern equine diagnostic tests
  - Access to specialist pathology services & laboratory capacity to deal with high sample throughputs in large disease outbreaks
  - A pro-active and prompt approach to be taken to investigate & control important endemic diseases e.g. neurological EHV-1
  - Provision of some subsidised laboratory testing to maintain compliance with disease control measures & submission of samples during the clearance phase of an outbreak
  - Access to expert epidemiological and disease control advice
Examples of success: Klebsiella capsule typing

- Technology transfer from human medicine for typing pathogenic capsule types (1, 2 and 5) of equine venereal pathogen *Klebsiella pneumoniae*
  - AHT has validated a multiplex end-point PCR from a method applied by the Health Protection Agency (HPA), London
  - PCR has improved accuracy and turnaround time over the old antiserum typing

![PCR Band Image]
Examples of success: Detecting Taylorella spp.

- Development of highly sensitive & discriminatory duplex qPCR diagnostic assay for *Taylorella equigenitalis* and *Taylorella asinigenitalis* – the causes of contagious metritis in horses and donkeys
  - The AHT qPCR detected the CEM outbreak in Glos. in 2012
  - The AHT qPCR detected the first UK case of *T. asinigenitalis* in a 3 y.o. donkey jack in Buckinghamshire in 2013
A dedicated equine pathology service

- Thoroughbred industry funding supports maintenance of dedicated equine pathology staff & facilities at AHT
  - Board-certified specialist equine pathologists and technicians
  - The Allen Centre for Vaccine Studies’ dedicated equine post mortem and carcase storage facilities
Investigation & control of neurological EHV-1

- Thoroughbred industry funding supports investigation & control of UK outbreaks of neurological EHV-1
  - Outbreaks of neurological EHV-1 in the general equine population may spill over into Thoroughbred racing and/or breeding, where they can have significant impacts
  - A basic premise is that prompt action in establishing diagnoses and taking appropriate control measures will minimise the risk of transmission and spillover
  - Supported by the Thoroughbred industry AHT conducts subsidised investigations of neurological EHV-1 outbreaks
  - The burden of neurological EHV-1 is not the same every year
    - The 10 months since November 2012 saw an unusually high number of outbreaks, both involving Thoroughbreds and non-Thoroughbreds
## Neurological EHV-1 investigations 2012-13

<table>
<thead>
<tr>
<th>No.</th>
<th>Yard Location</th>
<th>Period of Investigation</th>
<th>Premises Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Devon</td>
<td>Nov 2012 - Jan 2013</td>
<td>TB National Hunt training yard</td>
<td>Multiple cases, some fatal, possible link to yard 2 after re-opening</td>
</tr>
<tr>
<td>2</td>
<td>Somerset</td>
<td>Jan - Feb 2013</td>
<td>TB National Hunt training yard</td>
<td>Single non-fatal case, possible link to yard 1 through racing</td>
</tr>
<tr>
<td>3</td>
<td>Suffolk</td>
<td>Jan - Feb 2013</td>
<td>TB Flat training yard</td>
<td>Single fatal case, no known link to yard 1 or yard 2</td>
</tr>
<tr>
<td>4</td>
<td>Gloucestershire</td>
<td>Feb - Apr 2013</td>
<td>Yards linked to a hunt</td>
<td>Multiple cases, none fatal, known horse movement link to outbreak 7</td>
</tr>
<tr>
<td>5</td>
<td>Buckinghamshire</td>
<td>Febr - Mar 2013</td>
<td>Retirement yard</td>
<td>EHV-1 respiratory disease confirmed, neurological EHV-1 excluded</td>
</tr>
<tr>
<td>6</td>
<td>Gloucestershire</td>
<td>Mar - Apr 2013</td>
<td>Dressage yard</td>
<td>Single fatal case, same practice, different vet to outbreak 4</td>
</tr>
<tr>
<td>7</td>
<td>Gloucestershire</td>
<td>Mar - Apr 2013</td>
<td>Yards linked to a hunt</td>
<td>Several cases, known horse movement link to outbreak 4</td>
</tr>
<tr>
<td>8</td>
<td>Gloucestershire</td>
<td>Mar - Apr 2013</td>
<td>Veterinary practice isolation unit</td>
<td>EHV-1 confirmed, no neurological cases, linked to outbreaks 4, 6 &amp; 7</td>
</tr>
<tr>
<td>9</td>
<td>Wiltshire</td>
<td>Mar- Apr 2013</td>
<td>Yard linked to a hunt</td>
<td>EHV-1 confirmed, no neurological cases, had hunted with outbreak 7</td>
</tr>
<tr>
<td>10</td>
<td>Wiltshire</td>
<td>Mar - Apr 2013</td>
<td>Yard linked to a hunt</td>
<td>EHV-1 confirmed, possible neuro’ case, had hunted with outbreak 7</td>
</tr>
<tr>
<td>11</td>
<td>Aberdeenshire</td>
<td>Apr 2013</td>
<td>Dressage yard</td>
<td>EHV-1 confirmed, no neurological cases</td>
</tr>
<tr>
<td>12</td>
<td>Devon</td>
<td>Jul – Sep 2013</td>
<td>Mixed breed stud incl. TBs</td>
<td>Multiple cases, some fatal, one EHV-1 abortion</td>
</tr>
</tbody>
</table>

- Management of all outbreaks facilitated by use of diagnostic tests
  - Identification of EHV-1 pathogen (qPCR, virus isolation, IHC)
  - Identification of exposure by detecting antibodies raised against EHV-1 (Complement Fixation Test or CFT)
Stages in investigation and control of EHV-1 outbreaks

- Awareness by AHT of possible EHV-1 case/outbreak – veterinary surgeon speaks to AHT
- Preliminary investigation conducted by the vet
- Laboratory diagnosis of EHV-1 is established
- Understanding/controlling the situation on the ground e.g. stop movements, increase biosecurity
- Establish freedom from active infection through clinical & laboratory monitoring
- Satisfy stringent criteria for freedom from infection in order to return to normal activity
Actions during control of EHV-1 outbreaks

- **Segregate** population into discrete groups
- **Collect** full sample set of samples from all horses
  - NP swab (qPCR), 1 x serum (CFT), 3 x hep blood (VI)
- **Test** full sample set from all horses
  - Identifies extent of infectious & exposed horses
  - Facilitates removal into isolated group of infectious horses
- **Observe** all groups carefully for 3-4 weeks
  - **No cases seen in a group:** Collect & test NP swabs & sera (pair) from the group. Consider EHV-1 free if CFT pair & qPCR are negative.
  - **Cases seen in a group:** Immediately collect & test NP swabs, sera (as pair) & hep bloods from the group. Remove virus positives to isolation. Repeat after 2-3 weeks observation.