



# DEFRA / AHT / BEVA EQUINE QUARTERLY DISEASE SURVEILLANCE REPORT Volume 3, No.3: July-September 2007



## Highlights in this issue:

- Legislation for control of equine disease in the UK
- Re-appearance of atypical myoglobinuria/myopathy
- Equine influenza update

### 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.



## TABLE OF CONTENTS

<b><u>INTRODUCTION</u></b>	<b>3</b>
<b><u>VIROLOGY DISEASE REPORT FOR THE THIRD QUARTER OF 2007</u></b>	<b>5</b>
EQUINE HERPES VIRUS ABORTION	5
EQUINE HERPES VIRUS NEUROLOGICAL DISEASE	5
EQUINE HERPES VIRUS RESPIRATORY DISEASE	6
EQUINE HERPES VIRUS COITAL EXANTHEMA	6
EQUINE INFLUENZA	6
<b>EQUINE INFLUENZA UPDATE</b>	<b>8</b>
<b><u>BACTERIOLOGY DISEASE REPORT FOR THE THIRD QUARTER OF 2007</u></b>	<b>10</b>
<b>FOCUS ARTICLE: Legislation for control of equine disease in the UK</b>	<b>11</b>
<b><u>TOXIC DISEASE REPORT FOR THE THIRD QUARTER OF 2007</u></b>	<b>14</b>
<b>FOCUS ARTICLE: Re-appearance of atypical myoglobinuria/myopathy</b>	<b>15</b>
<b><u>PARASITIC DISEASE REPORT FOR THE THIRD QUARTER OF 2007</u></b>	<b>17</b>
<b><u>REPORT ON <i>POST-MORTEM</i> EXAMINATIONS FOR THE THIRD QUARTER 2007</u></b>	<b>17</b>
EAST ANGLIA	17
HOME COUNTIES	18
SOUTH WEST	18
SCOTLAND	18
NORTHERN IRELAND	19
<b><u>ACKNOWLEDGEMENTS</u></b>	<b>20</b>



## **Introduction**

Welcome to the third quarterly equine disease surveillance report for 2007 produced by DEFRA, BEVA and the Animal Health Trust. 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.

Regular readers will be aware that the vector borne *Lentivirus* disease Equine Infectious Anaemia (EIA) re-emerged in Europe during 2006, including the first outbreak to affect horses in the Republic of Ireland. There have been no further cases identified in Ireland since March 2007 when the country was declared free of the disease. However, a case of EIA was reported in France in September. The case was identified in the same Ardeche department as two cases identified earlier in 2007. The affected horse was a 12 year old saddle mare of unknown origin. The mare died. A serological investigation covering a 3km radius from the affected premises is underway. In Germany, one case of EIA was identified in August. The affected horse had been imported from Romania but had resided at the premises since 1998. The horse was euthanased and an investigation to identify any spread of disease was undertaken. The recently launched HBLB Codes of Practice for 2008 (further details in next report) now include a specific code for EIA. The Codes of Practice can be accessed at <http://www.hblb.org.uk>.

The emergence of Bluetongue (BT) in cattle and sheep in the south east of England and East Anglia has served as an unwelcome reminder of the British Horse Population's vulnerability to African horse sickness (AHS). AHS is the most feared of all horse diseases, causing mortality of up to 90% in outbreaks. AHS is transmitted between horses and donkeys by the same biting midges that transmit BT and the considerable spread of BT in the UK demonstrates clearly the ability of British midges to transmit this family of viruses. AHS is currently restricted to the African continent and has caused outbreaks in 2007 in Nigeria, The Gambia and Sudan. AHS has not been seen in Europe since the early 1990s, when it was introduced by a shipment of zebra from Namibia. Climate change is thought to increase the risk of all vector borne diseases being transmitted. The Horse Trust has been co-ordinating an AHS awareness raising programme during 2007 and is working with international AHS experts to identify whether current control and contingency plans for dealing with the disease in Europe are in need of updating. This area will be explored in more depth in a focus article in the next issue.

The British Equine Veterinary Association's annual conference was held in September in Edinburgh. The conference was a great success and attended by equine vets from all over the country. Professor Alistair Barr was awarded the lifetime achievement award for his contributions to the equine profession. Professor Barr is the Professor of Veterinary Surgery and Head of Equine Clinical Services at Bristol vet school and is a former president of the British Equine Veterinary Association and the Federation of European Equine Veterinary Associations. The work of Professor Barr has been extremely important in developing UK and European Law with regards to the availability of equine medicines. The equine veterinary community is indebted to him for his work in this important area, along with his many other important contributions to equine veterinary medicine.



Equine influenza (EI) has continued to be of importance around the world during this quarter. As mentioned in the last report, an outbreak of EI began in Australia in August of this year. In addition, outbreaks have recently occurred in Kazakhstan, Mongolia and China. An update on the global equine influenza situation, with particular reference to Australia, can be found in the virology section of this report.

This quarter's report features an article by Katherine Whitwell, FRCVS on atypical myopathy. The incidence of atypical myopathy appears to be increasing in the UK and this article provides a useful review of the condition. In addition, this quarter's report features an article from Neil Brooks from the International Animal Health Core Team of DEFRA detailing the legislation pertaining to equine disease control in the UK. This article serves to raise awareness about the legislation currently in place in the UK and identifies areas that are likely to change in the near future. We are grateful to the contributors for providing these articles.

We reiterate that the views expressed in these focus articles are the authors' own and should not be interpreted as official statements of DEFRA, BEVA or the AHT.

Access to all of the equine disease surveillance reports can be made on a dedicated page on the Animal Health Trust website at [http://www.aht.org.uk/equine\\_disease.html](http://www.aht.org.uk/equine_disease.html) or via the BEVA and Defra websites:

<http://www.beva.org.uk/>

<http://www.defra.gov.uk/animalh/diseases/vetsurveillance/species/horses/index.htm>

We would remind readers and their colleagues that there is available on the AHT website a form for registration to receive free of charge reports regularly via e-mail as they are produced. The link for this registration form is available via [http://www.aht.org.uk/equine\\_disease\\_registration.html](http://www.aht.org.uk/equine_disease_registration.html).



## Virology Disease Report for the third quarter of 2007

The results of virological testing for July - September 2007, are summarised in Table 1, and include data relating to equine viral arteritis virus from the Veterinary Laboratories Agency (VLA), Weybridge. The sample population for the VLA is different from that for the other contributing laboratories, as the VLA's tests are principally in relation to international trade. Of the 23 EVA VN positives detected by the VLA, 3 were among export samples, 17 from imports and the remainder were private requests. The 3 semen samples received for virus isolation were all negative for EVA virus isolation after 3 passages in RK13 cell culture, and negative for EVA by the one-tube RT-PCR

**Table 1: Diagnostic virology sample throughput and positive results for the third quarter 2007**

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<b><u>Serological Tests</u></b>			
EVA ELISA	777	31 <sup>#</sup>	2
EVA VN	254	19 <sup>#</sup>	3
VLA EVA VN	524	23 <sup>#</sup>	1
EHV-1/-4 CF test	679	29*	2
EHV-3 VN test	10	5	1
ERV-1/-2 CF test	427	6*	1
Influenza HI test	624	12*	1
EIA (Coggins)	153	0	2
<b><u>Virus Detection</u></b>			
EHV-1/-4 PCR	27	1	1
EHV-2/-5 PCR	1	0	1
Influenza NP ELISA	199	34	1
Influenza VI in eggs	4	2	1
EHV VI	406	4	1
EVA VI/ PCR	0	0	0
VLA EVA VI/ PCR	3	0	1
Rotavirus	101	59	8

VN = virus neutralisation, ELISA = enzyme-linked immunosorbent assay, CF = complement fixation, HI = haemagglutination inhibition, PCR = polymerase chain reaction, NP = nucleoprotein, VI = virus isolation  
EVA = equine viral arteritis, EHV = equine herpes virus, ERV = equine rhinovirus,  
EIA = equine infectious anaemia, # = Seropositives include vaccinated stallions  
\* = Diagnosed positive on basis of seroconversion between paired sera

### **Virological Diagnoses for the Third Quarter of 2007**

#### **EHV-1 Abortion**

No EHV associated abortions were identified in this quarter.

#### **EHV-1 Neurological Disease**

Three outbreaks of EHV associated neurological disease were identified in this quarter. The largest outbreak was in Cheshire involving a livery yard of over 30 horses. Seven



horses developed clinical signs of neurological disease; one case resulted in euthanasia. EHV-1 was isolated on a nasal swab from one of the affected horses. PCR of the virus showed that it contained the Orf-30 paralytic marker. EHV PCR of brain and spinal cord tissue from the terminal case was positive for EHV-1 and 4. All affected horses seroconverted to EHV-1 and 4. Extensive serological testing was carried out on the yard and 6 other horses with evidence of recent exposure to EHV were identified. The yard imposed voluntary movement restrictions on all horses on the yard until it could be determined that no further virus circulation was occurring. Extensive serological testing was conducted to monitor spread of virus around the yard. Movement restrictions were kept in place for over 9 weeks until it was serologically determined that no further spread was occurring. No evidence of clinical disease was identified on surrounding yards.

Two other cases of EHV associated neurological disease were identified during this quarter. A pony in Wiltshire developed pyrexia and ataxia after returning from a camp. Serological testing revealed seroconversion to EHV-1 and 4; samples were not submitted for virus isolation. The pony was kept with one other horse which showed serological evidence of exposure to EHV but no clinical signs. The affected pony recovered uneventfully.

The second case occurred in West Sussex. The horse developed clinical signs of neurological disease and demonstrated EHV-1 seroconversion. One additional horse on the farm did develop ataxia; however, diagnostic testing was not performed. All other horses (5) on the yard were tested for exposure to EHV, but no further serological evidence of EHV exposure was identified. Movement restrictions were implemented voluntarily until it was clear there was no further serological evidence of virus circulation on the yard.

### **EHV-1 Respiratory Disease**

An outbreak of respiratory disease associated with EHV infection was identified in a group of donkeys. EHV-1 was isolated on nasopharyngeal swabs taken from 2 donkeys. Both donkeys demonstrated seroconversion to EHV and 2 additional donkeys seroconverted to EHV.

EHV-4 was isolated from a nasopharyngeal swab from a foal which was part of a group exhibiting signs of respiratory disease. The other foals in the group (2) demonstrated EHV-4 seroconversion. The dams of the foals were vaccinated against EHV and showed no signs of clinical disease.

### **EHV-3 Coital Exanthema**

Two outbreaks of EHV-3 coital exanthema were identified in this quarter.

### **Equine Influenza**

An outbreak of equine influenza virus (EIV) occurred in early July in Scotland. The outbreak involved a yard of non-vaccinated Shetland ponies. One pony tested positive for EIV on nucleoprotein ELISA applied to a nasopharyngeal swab and four other ponies on the yard demonstrated serological evidence of exposure to EIV. No other outbreaks of EIV had been reported in the area, but the ponies had recently attended the Royal Highland Show where extensive mixing with other horses had occurred. The virus was isolated in embryonated eggs. Characterisation of the isolate revealed the HA1 nucleotide sequence to be identical to two viruses identified in England early in 2007 (Solihull/1/07 and Maidstone/1/07).



An outbreak of equine influenza occurred in a riding school in London where the majority of horses were non-vaccinated. Two horses re-entered the yard after being stabled for a short-time near the south coast of England. Respiratory disease associated with coughing and pyrexia affected many of the horses on the yard. Two horses were initially tested for influenza via nucleoprotein ELISA testing; both tested positive. Further screening of all animals on the yard revealed that the majority of animals had serological evidence of exposure to equine influenza virus (29 out of 43). The virus was grown in eggs and characterization was performed. The virus was found to be of the variant-American lineage and similar to viruses circulating in the UK earlier this year. The sub-lineage of virus currently circulating in the UK is distinct from the sub-lineage identified this year in Australia, Japan and the USA.

Two isolated cases of equine influenza virus were also identified in this quarter. In the first case, the affected horse was stabled with one other horse only. The in-contact animal did not develop signs of equine influenza. The second case was a vaccinated Thoroughbred which had been imported from Ireland. The horse developed clinical signs of influenza while in quarantine on arrival at the destination yard. No other horses had been exposed to the affected animal since arrival. Investigation of the vaccination status of the horse revealed the primary vaccination course had been administered incorrectly.



## **EQUINE INFLUENZA UPDATE**

**Julie Ross MA, VetMB, MRCVS, Dip.ACVM**

Equine influenza (EI) outbreaks have been identified in Australia and Japan during the third quarter of this year. In addition, more recently, outbreaks of EI have also occurred in Kazakhstan, China and Mongolia. Little is known at this time about the strains of influenza circulating in central Asia. The last known outbreak of EI in Mongolia was 2005 and the Chinese last reported EI in 1994. This article will focus on the situation with regards EI in Australia and Japan.

Equine influenza was identified in Japan on August 15<sup>th</sup> 2007. Japan has been free of equine influenza for 36 years and all racehorses in the country are vaccinated twice a year against EI. The outbreak affected thoroughbred and non-thoroughbred horses throughout the country. As of October 3<sup>rd</sup>, it was estimated that 1350 horses had been clinically or sub-clinically affected by EI. Six race meetings were cancelled on August 18<sup>th</sup>-19<sup>th</sup> at Sapporo, Niigata and Kokura racecourses. Japanese Racing Authority (JRA) race meetings resumed on August 25<sup>th</sup> under strict biosecurity conditions. The origin of the Japanese virus and means by which it entered the country are still under investigation. The virus is known to be of the variant American (also known as Florida) sublineage of EI viruses.

On August 17<sup>th</sup>, equine influenza was detected in the Eastern Creek Quarantine Station in Sydney, New South Wales, Australia. Horses at Centennial Parklands Equestrian Centre, Sydney began to show clinical signs consistent with influenza on August 22<sup>nd</sup> and a diagnosis of equine influenza was made using PCR techniques. The disease spread quickly through New South Wales and the south-east corner of Queensland. The vast majority of the Australian horse population is not vaccinated against equine influenza and consequently the disease spread rapidly through the naïve population. As of December 7<sup>th</sup>, there were 4267 infected properties in New South Wales and 2050 infected properties in Queensland. In total, over 40,000 horses have been affected. The Northern Territory, South Australia, Western Australia, Victoria and Tasmania to date remain free of EI. Importation of horses from New South Wales is banned in all states and territories. Horses from Queensland can be moved into the Northern Territory if certain criteria are met.

This outbreak of disease has come at a critical time for the Australian equine industry as the breeding and foaling season run through the latter half of the year. In addition, the Spring racing carnival (including the Melbourne Cup) has recently taken place, and many contenders were unable to participate due to being unable to leave New South Wales. The government has implemented strategies aimed at disease control and eradication and at this time, although new cases are still occurring, the number of new cases appears to be decreasing. The number of new cases of equine influenza peaked in late September and has been declining since that time.

To aid in control and eradication of EI, the affected areas of New South Wales and Queensland have been divided into zones, with different restrictions and requirements in each zone. In New South Wales, a 'purple zone' in which there is a high density of



affected premises in relatively close proximity has been established. The 'purple zone' covers area from Tamworth to Camden and includes the horse-dense area of the Hunter Valley where much of Australia's breeding occurs. The purple zone is regarded as highly infected. Within this zone, horse movement is not restricted and many horses within the zone have been affected by EI. By allowing free movement in this area, breeding was able to continue to some degree; however there has obviously still been a significant effect on the breeding season due to EI. Horses were allowed to enter the purple zone until October 31<sup>st</sup>. No horses are allowed to leave the zone and will not be able to do so until the area is declared safe by government authorities. Any humans, vehicles or equipment leaving the purple zone must be thoroughly disinfected to prevent disease spread out of this highly infected area.

A 'red' restricted area is in place around the purple zone in New South Wales and also for 10km around any infected premises outwith the purple zone. Movement standstills and strict biosecurity measures are in place in red zones to try to prevent disease spread. Horse owners in red and purple zones are advised to check their horse's temperature and general health twice daily for a period of 10 days. Low risk 'amber' zones have been established around all high risk area. There are no confirmed influenza cases within amber zones. Movement is limited within these areas and can only occur if a permit is obtained. Horses cannot leave the amber zone. A protected 'green' zone has also been established. Horse movement is allowed within this zone as long as the horse has a valid 'travelling horse statement'. Horses are closely monitored for signs of disease. Horses cannot move out of the green zone, but some horses can move into the green zone from non-infected area. Rezoning is occurring based on the results of extensive testing of areas now thought to be free of disease.

Vaccination buffer zones have also been established around infected areas to try to strengthen the containment programme. Vaccination is being strategically planned and carried out by the Department of Primary Industries. In addition to horses within vaccination buffer zones, vaccination of some horses of high socio-economic value is also occurring i.e. racehorses and police horses. A limited supply of vaccine has also been made available to the racing industry in Victoria.

The equine influenza virus in Australia is known to be similar to the Wisconsin-03 influenza virus. This strain of influenza virus has not so far been identified in the UK, or in samples from UK horses which have recently been in Ireland. The effect of equine influenza on the Australian horse industry has been devastating with significant economic losses in the racing and breeding industries, lost training of performance horses and welfare implications for the affected animals. The consequences of this outbreak have highlighted the need for rigorous quarantine and biosecurity measures to be enforced and monitored as international horse transport increases. Quarantine procedures are being reviewed in Australia and the outbreak is currently the subject of a judicial inquiry.

Information on the current status of equine influenza in the UK can be found in the virology section of the report. Further information on the outbreak of influenza in Australia can be found at <http://www.outbreak.gov.au>



## Bacteriology Disease Report for the third quarter 2007

A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Table 2. For contagious equine metritis (CEM) 11 of 28 HBLB approved laboratories contributed data.

### VLA CEMO Data for the period July - September 2007

We are again pleased to include data relating to CEM testing from the Veterinary Laboratories Agency (VLA), in this quarterly report. The sample population for the VLA is different from that for the other contributing laboratories as the VLA tests are principally in relation to international trade.

Submissions for International Trade pre-export tests were decreased 13% when compared with the same quarter in 2006. The number of swabs submitted was down by 8%.

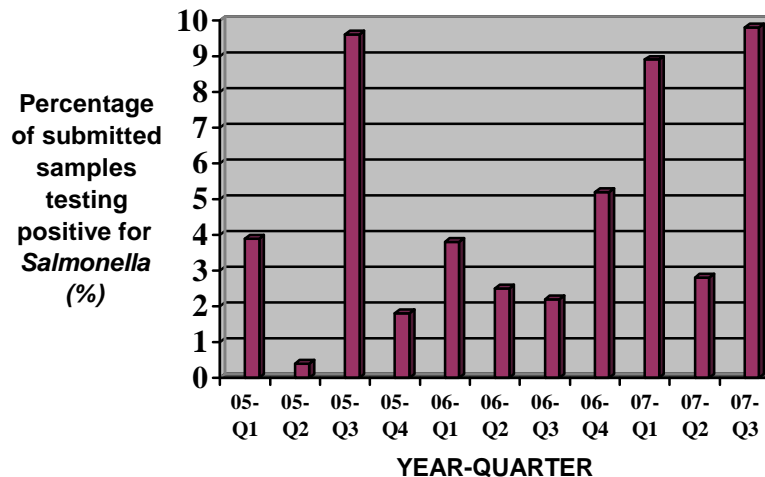
**Table 2: Diagnostic bacteriology sample throughput and positive results for third quarter 2007**

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<b>CEMO (HBLB)</b>	1167	0	11
<b>CEMO (VLA)</b>	691	0	1
<b>Strangles*</b>	1398	222	11
<b>Strangles PCR</b>	606	127	1
<b>Salmonellosis</b>	458	45	10
<b>MRSA</b>	52	0	9
<b>Clostridium perfringens</b>	233	1	3
<b>Clostridium difficile (toxin by ELISA)</b>	280	8	7
<b>Cryptosporidium</b>	56	0	1

CEMO = contagious equine metritis organism (*Taylorella equigenitalis*); HBLB = HBLB accredited laboratories; VLA = VLA reference laboratory; \**Streptococcus equi* subsp. *equi*; MRSA = meticillin resistant *Staphylococcus aureus*.

Of the 45 samples testing positive for *Salmonella* spp., the serotype of 30 are known after further testing by the VLA. Of the 30 typed strains there were 20 of *S. typhimurium*, four *S. Newport*, two *S. enteritidis*, two *S. kottbus* and one each of *S. derby* and *S. agama*.

Regular readers will note a large increase in *Salmonella* positive results in this quarter. Analysis of data from the last 3 years shows that although there has been a recent (over the last 12 months) increase in the total number of *Salmonella* tests performed, the average number of tests performed per laboratory has not increased. The percent of samples submitted to laboratories that tested positive for *Salmonella* does, however, appears to have increased over the same time period (excepting the 2<sup>nd</sup> quarter of 2007) (see graph below). The reason for, and importance of, this increase is unknown but the situation will continue to be monitored. We would like to take this opportunity to remind readers that all cases diagnosed with *Salmonella* should be reported to the divisional veterinary manager (DVM).



### Legislation for control of Equine Diseases in UK

Neil Brooks BVM&S, BSc, MRCVS

International Animal Health Core Team, DEFRA

#### European Legislation

There are a number of pieces of legislation in place regarding equine movements within the EU and regarding the control of equine notifiable diseases. Several aspects of equine health are agreed at Community level. This article aims to highlight the legislation that is most relevant to equine veterinary practitioners and to outline the equine diseases that are currently notifiable in the UK and EU.

**Council Directive 90/426/EEC** (and associated Commission Decisions) details the health conditions applicable for equine trade and movement within the EU and the health conditions applicable for the import of equines from third countries. Under this Directive, equines may only move between Member States if they come from premises which have not been restricted on account of a number of specified diseases. Import of equines into the EU is only permitted from countries that are free of African horse sickness and which do not permit vaccination against this disease.

**Commission Decision 93/623/EEC** lays down rules on passports for equines. This Decision is currently under discussion in Brussels and will be updated to introduce the concept of electronic identification.

**Council Directive 82/894/EEC** specifies a number of equine diseases that are notifiable to the Commission, these diseases include:



African horse sickness (AHS)  
Dourine (causative agent *Trypanosoma equiperdum*)  
Equine Infectious Anaemia (EIA)  
Equine encephalomyelitis (EE) (of all types, including Venezuelan equine encephalitis, Eastern equine encephalitis, Western equine encephalitis, Japanese encephalitis, West Nile Virus)  
Glanders or Farcy (causative agent *Burkholderia* (formerly *Pseudomonas*) *mallei*)  
Vesicular Stomatitis

Once a disease has been notified, the action taken depends on the disease involved and the circumstances of the individual outbreak. The action taken is monitored by the Standing Committee on Food Chain and Animal Health (SCoFAH). In the event of serious disease problems, measures to restrict the movement of equines from any Member State can be introduced.

**Council Directive 90/426/EEC** specifies the restrictions to be placed on a premises affected by an outbreak of a notifiable disease. Following any outbreak of notifiable disease, restrictions would remain in place on affected holdings until the premises were declared disease free.

**Council Directive 92/35/EEC** outlines control rules and measures to combat African horse sickness. This is the only specific EU Directive for a single equine disease. African horse sickness is covered by a specific directive due to the devastating potential for AHS to be rapidly spread by insect vectors and to cause serious equine mortality in a naïve equine population such as the equine population of the EU.

### UK Legislation

UK legislation to control notifiable equine disease in England is currently laid down in the following statutes:

Infectious Diseases of Horses Order 1987  
Movement of Animals Restrictions Order 2002  
The Specified Diseases (Notification and Slaughter) Order 1992  
The Specified Diseases (Notification) Order 1996  
The Specified Diseases (Notification and Slaughter) Order 2006  
The Infectious Anaemia (Compensation) (England) Order 2006  
Similar orders apply for Scotland and Wales.

All diseases notifiable in the EU are also notifiable in the UK. In addition, the following are notifiable in the UK:

Epizootic Lymphangitis (causative agent *Histoplasma farciminosum*)  
Equine Viral Arteritis (EVA)  
Contagious Equine Metritis Organism (CEMO) (causative agent *Taylorella equigenitalis*)

Although notifiable, EVA and CEMO have no human health implications and once notified are controlled voluntarily by the equine industry using guidelines drawn up by the Horse Race Betting Levy Board (HBLB). Of the other diseases listed as notifiable, many have never been recorded in the UK (e.g. equine encephalomyelitis (all types), Dourine), or were eradicated many years ago (e.g. Glanders). EIA has been recorded in the UK (GB 1976 and N. Ireland 2006) but was successfully eliminated in both cases.



### **Notifiable disease of concern in the UK**

The notifiable diseases of real concern are the encephalitides and AHS. None of these diseases have been recorded in the UK. These diseases are vector borne, the encephalitides via mosquitoes and AHS by midges of the *Culicoides* genera (which are also the vectors of the recent Bluetongue outbreak in Eastern England). The outbreak of Bluetongue in the UK has led to concern at the possibility of these new exotic diseases spreading to northern Europe in the wake of climate change. AHS is of concern due to the devastating effect of this disease on the equine population with high mortality recorded when a disease outbreak occurs in a naïve population. The encephalitis viruses also have the potential to be of serious concern due to their potential to cause human disease as well as equine disease. Because of the serious public health implications, control of any encephalitides outbreak would probably have to be led by the Department of Health acting in partnership with Defra.

The current UK legislation cited in this article provides the necessary power for DEFRA (Animal Health) to issue essential orders to try to control any disease outbreak and limit disease spread. However, it has been recognised that a new updated version of the Infectious Diseases of Horses Order 1987 (IDHO) is needed to reflect new information and lessons learnt from the control of Bluetongue. This vector borne disease is seen as a model of how other insect borne disease might spread in the EU. Updated measures would allow more efficient controls to be enacted should an outbreak of exotic disease occur in the UK equine population. A revised draft of the Infectious Diseases of Horses Order was extensively discussed within Defra in the early part of 2007 but the three outbreaks of notifiable disease in England this year (Foot and Mouth Disease, Blue Tongue Virus, Avian Influenza) have temporarily diverted resources away from this area. With the end of the current outbreaks now in sight, it is hoped that work on completing the update of the equine legislation can resume as soon as is practicable.

### **Contingency planning**

In August 2005, DEFRA published the STEED contingency plan (Specified Type Equine Exotic Diseases). This document was a comprehensive emergency response plan for equine diseases. The plan has now been overtaken by DEFRA's contingency planning for all exotic animal diseases. These contingency plans are updated annually. The most recent plan was put out to public consultation in July and covers some equine diseases, such as equine encephalitis. Policy aspects of control of notifiable diseases are not included in this plan to allow DEFRA to be more flexible and respond more rapidly to changing disease situations and changing EU legislation.



### **Toxic and Parasitic Disease Report for the Third Quarter of 2007**

A summary of diagnostic toxicosis and parasitology testing undertaken by contributing laboratories is presented in Tables 3 and 4 respectively. Results are based on histopathologically confirmed evidence of disease only.

**Table 3: Diagnostic toxicosis sample throughput and positive results for third quarter 2007**

	<b>Number of Samples Tested</b>	<b>Number Positive</b>	<b>Number of Contributing Laboratories</b>
Grass Sickness	25	15	3
Hepatic toxicoses	24	5	3
Atypical myopathy*	1	1	1

Atypical myopathy appears to be increasing in frequency in the UK at this time. A review of this condition is included as a focus article in this edition of the report (see below).

An ongoing investigation is occurring at a premise in the Midlands where five young Trakehner horses developed sudden onset blindness over a period of 2 weeks. The horses each also developed hind limb ataxia within 24 hours of blindness and one horse demonstrated abnormal 'lip-smacking' behaviour. One fatality occurred; no *post-mortem* was carried out. Menace and pupillary light reflex (PLR) remained intact in each horse and no ophthalmic changes were identified. Clinical chemistry revealed liver enzymes to be increased, but bile acids were within normal limits, suggesting liver function was not affected. Whole blood lead concentration was within normal limits. So far no cause has been identified. The four surviving horses remain affected several weeks after the onset of blindness. All the horses are coping well with their blindness and are paired with companion horses. The local Animal Health Officer has been informed about the cases, but there is no suspicion of these clinical signs being associated with a notifiable disease.



**Re-appearance of atypical myoglobinuria/ myopathy**  
Katherine Whitwell FRCVS, Animal Health Trust, Newmarket.

This short article is to inform colleagues that a frequently fatal disease of grazing horses, atypical myoglobinuria/ myopathy (AM), whose aetiology is not known, has made a re-appearance this autumn and winter in the UK. The condition, first noted in the UK in 1939 and first reported in 1942, was identified again in 1985 and 1986 as the cause of multiple deaths in grazing horses in the UK.<sup>1,2</sup> Since then it has only been seen very sporadically in the UK. It has also been recognised in European countries - Germany in 1995, Belgium in 2000 and France in 2002. Some of these countries experienced large numbers of deaths from AM (over 100 in Germany in the autumn of 1995 during one large outbreak in the north of the country).<sup>3</sup> It is more common in young horses and has an association with inclement weather.

**Clinical Diagnosis**

Clinically AM appears in one or more horses at grass as a sudden onset of muscle weakness, lethargy, recumbency and death. Muscle tremors and tachycardia may occur and some horses are dyspnoeic. Exercise is not a pre-requisite. Horses are afebrile, and appetite may be retained but some show dysphagia. Deterioration is usually rapid. Clinical chemistry usually shows markedly elevated CK, AST and LDH: SDH is variably elevated. Serum calcium may be very low and should be checked. Urine samples can be discoloured due to myoglobinuria,

**Action:** On suspicion of a case/cases it is recommended that the affected horse and its co-grazers be removed from the paddock and assessed clinically and biochemically. Affected horses are given intensive supportive treatment.

**Concurrent AM and equine grass sickness (EGS):** A recent publication from Belgium records two separate cases of sudden recumbency at pasture in which lesions believed to be consistent with both AM and EGS were discovered.<sup>4,5</sup> Similarities in the risk factors for both conditions were highlighted. The authors concluded their cases suggest common predisposing causes rather than a common aetiology.

**Pathological diagnosis**

**Sampling:** In AM, in view of the potential for multiple cases it is recommended that sudden deaths at pasture and horses dying after a short illness showing weakness and recumbency be subjected to a detailed necropsy. The necropsy should aim to screen for all causes of weakness, sudden recumbency and death (including recent trauma, acute infections including equine herpes virus (EHV), and visceral ruptures and displacements). It is recommended that, as well as gross and routine histological examination of all the main organs, the necropsy includes tissue harvesting to enable histological assessment of muscle at many sites particularly postural, respiratory and cardiac muscle, autonomic ganglia (e.g. cranial cervical and coeliaco-mesenteric) and samples of CNS from brain and spinal cord. Where acute infections cannot be ruled out appropriate microbiological screening measures should be a priority.

**Gross Findings:** There are no consistent gross changes in AM but in some there may be obvious discolouration of striated and cardiac muscle, and distension of the bladder with dark myoglobin-stained urine.

**Histological findings:** Affected striated muscle shows segmental myodegeneration at different stages from simple loss of cross striations and eosinophilia, to sarcoplasmic condensation and discontinuity. The sarcolemmal sheath usually stays intact but may be distorted by swellings and indentations. Intercostal muscles, diaphragm and postural



muscles are commonly affected. A cell response to the degenerate fibres is mainly by macrophages but some also attract neutrophils. Hepatocytes often show vacuolar change, as do some renal tubular epithelial cells and the adrenal cortex *zona fasciculata*. Scattered renal tubular pink to red granular casts are seen in the kidneys.

### **Final diagnosis**

This is best determined with the benefit of the combined results of clinical, biochemical and pathological findings. Whilst they can be highly suggestive of a diagnosis, neither the clinical nor the gross pathologic changes are pathognomic of AM and so histological assessments are essential. As some myopathic changes can occur secondary to recumbency the appearance of the intercostals and diaphragmatic muscle are particularly relevant. Exclusion of an underlying central neuropathy is also important, EHV paralysis in particular.

AM is a poorly understood condition and has the potential to cause substantial losses. The literature suggests a mortality rate of 89%. An Atypical Myopathy Alert Group (AMAG) is collecting data on AM cases throughout Europe with a view to improving knowledge of the condition. More information can be found about atypical myopathy at [www.myopathieatypique.be](http://www.myopathieatypique.be)

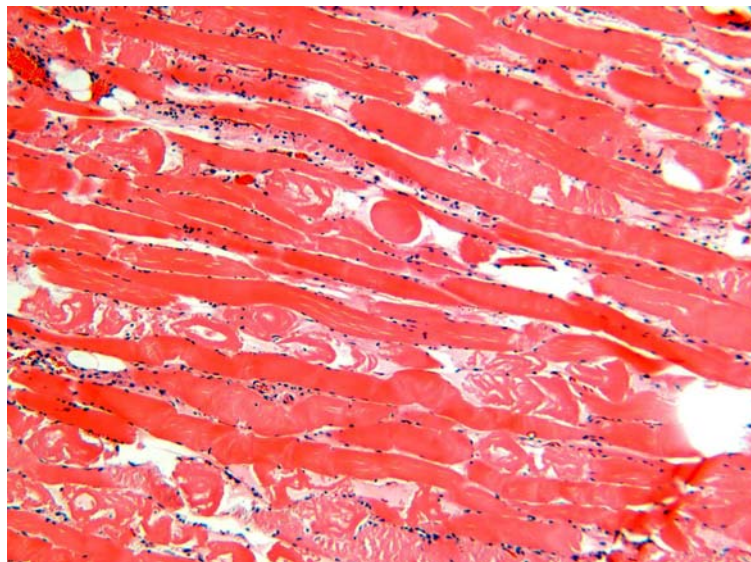


Figure 1: Striated muscle showing acute myodegeneration. H&E x 100

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**Table 4: Diagnostic parasitology sample throughput and positive results for the third quarter 2007**

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<b><u>Endoparasites</u></b>			
Ascarids	823	21	6
Cyathostomes	901	221	6
Dictyocaulus	145	2	2
Strongyles	864	57	8
Tapeworms	156	10	2
Trichostrongylus	740	4	4
Strongyloides	760	8	5
<b><u>Ectoparasites</u></b>			
Mites	176	3	4
Ringworm	265	68	6
Dermatophilus	10	2	2

### Report on *Post Mortem* Examinations for Third Quarter 2007

#### **East Anglia**

*37 cases were examined, including 14 fetuses/neonates.*

Eleven aborted/still-born fetuses were examined during this quarter. Four aborted fetuses were found to have suffered from a twisted umbilical cord and in one further case, vascular obstruction of the umbilical cord was identified. Abnormalities associated with the placenta were identified in 2 cases of abortions; one case had evidence of placentitis and endometritis and one had diffuse placental villous mineralisation. No diagnosis was recorded in the remainder of the foetal cases examined. Three neonates were examined. *Clostridial piliforme* toxæmia (Tyzzer's disease) was identified as the cause of death in one neonate. Findings in the 2 remaining neonates included ulcerative colitis (1) and peritonitis with endotoxaemia (1).

Two foals were examined in this quarter. The first was presented due to sudden death; no cause of death was identified on *post-mortem* examination. The second foal had evidence of flexural limb deformities that were believed to have been the reason for the foal being euthanised.

Six cases with gastrointestinal lesions were examined. Three horses had evidence of inflammatory lesions of the gastrointestinal tract (enterocolitis (1), ulcerative typhlocolitis (1) and ulcerative ileitis (1)). The remaining cases had evidence of gastric rupture (1), large colon volvulus (1) and abdominal haemorrhage (1).

Four horses with evidence of neurological disease were presented for *post-mortem* examination. One horse had clinical signs of central neurological disease; no definitive diagnosis was reached. Diagnosis was not specified in the remaining neurological cases. Four musculoskeletal cases were examined. One horse had findings characteristic of



atypical myopathy and one had evidence of acute polymyositis. The remaining horses had evidence of laminitis (1) and a bone cyst in P3 (1).

Three horses were presented due to respiratory problems. In one case, evidence of focal interstitial pneumonia was identified on *post-mortem* examination. The second horse was a polo pony which had undergone a long period of transportation from Argentina to England via boat and lorry. *Post-mortem* examination revealed pericarditis and severe bilateral pneumonia and pleuritis. Thoracic trauma was identified in the third case.

Four further cases were examined. Findings included lymphosarcoma (1), *Clostridial* septicæmia (1), mesenteric thrombus (1) and acute hyperlipemia (1).

### **Home Counties**

*Four horses were examined.*

One anaesthesia related death was reported during this quarter. *Post-mortem* examination revealed pleuropneumonia. One horse presented with signs of gastrointestinal disease and was euthanased during colic surgery due to irreducible ceacocolic intussusception. One musculoskeletal case was presented for *post-mortem* examination. Findings included degenerative joint disease of the hip. One case was examined after death immediately following an adverse reaction to Neomycin/Penicillin administration (administered for an orthopaedic complaint). No cause of death was identified.

### **South West**

*Five donkeys and ten horses were examined.*

Two donkeys were euthanased on welfare grounds; one due to chronic foot pain associated with laminitis and the other due to signs of colic. One donkey was euthanased due to respiratory problems; *post-mortem* examination revealed evidence of recurrent airway obstruction. *Post-mortem* examination of one donkey revealed hepatopathy, hyperlipemia, gastric ulceration and nephropathy. Sclerosis of the aortic valve was also identified.

Five horses were presented for *post-mortem* due to gastrointestinal disease. Findings included two cases of colitis (1 due to nematodes, 1 due to *Salmonella*), ruptured diaphragm (1), impaction of the large colon (1) and fibrinous peritonitis post colic surgery (1).

One horse presenting due to neurological disease was examined. *Post-mortem* examination revealed encephalomalacia suspected to be of parasitic origin. Evaluation of a horse presenting with signs of cardiac disease revealed hypertrophic cardiomyopathy. The three remaining cases included generalised lymphoma (1), comminuted fracture of the olecranon process (1) and intra-abdominal haemorrhage associated with a stromal tumour of the sex cord (1).

### **Scotland**

*Twenty six cases were examined including 1 neonate.*

Fourteen horses presented due to gastrointestinal disease. Eight horses were identified as grass sickness cases; 3 acute, 3 subacute and 2 non-specified. The remaining horses had evidence of necrotising enteritis (1), typhlocolitis (1), enteropathy (1), intestinal lymphosarcoma (1) and small intestinal entrapment due to a mesenteric lipoma (1). A yearling filly presented due to signs of abdominal pain after surgical repair of a



diaphragmatic hernia caused by fractured ribs. *Post-mortem* examination revealed dehiscence of the diaphragmatic repair.

Three musculoskeletal cases were examined. Findings included congenital tendon abnormalities (1) and septic arthritis (2). One horse was presented due to signs of respiratory disease; findings were consistent with recurrent airway obstruction. The remaining cases had evidence of a persistent right aortic arch (1), renal fibrosis (1), thrombosis (1) and unspecified trauma (1). A non-conclusive diagnosis was made in the remainder of the cases.

### **Northern Ireland**

*Fourteen cases were examined including two neonates and four donkeys.*

Two neonates presenting separately due to sudden death were examined. Icterus was identified on *post-mortem* examination of the first neonate and neonatal isoerythrolysis was suspected to be the cause of death. The second neonate had fractures of the 5<sup>th</sup>-7<sup>th</sup> ribs with evidence of haemorrhage into the surrounding intercostal muscles. In addition, a blood clot was identified on the ventral aspect of the cerebellum. A traumatic incident was suspected based on these findings.

Five foals were examined. Two of the foals had evidence of *Rhodococcus equi* abscesses within the lung parenchyma, and one of the foals also had an abscess adhering to the caecal mesentery. Nine other foals in the group had been reported to have died with similar clinical signs. A 3 month old foal with clinical signs of lethargy, tachypnea and tachycardia was examined and found to have gas distended stomach and intestines. A large number of *Parascaris equorum* worms were identified within the gastrointestinal tract. Two donkey foals were examined. *Post-mortem* findings included colitis associated with antibiotic use (1) and steatitis (1). The donkey foal with steatitis was a member of a group in which 3 foals had recently died.

Two adult donkeys were examined. One donkey had evidence of hydropericardium and myocardial infarction with hepatic periacinar congestion and necrosis also identified. The second donkey died after acute onset respiratory disease. *Post-mortem* examination revealed alveolar collapse and congestion with emphysema, bronchitis and bronchiolitis. No causative agent was identified.

Three adult horses were examined. A stallion euthanased due to signs of progressive encephalopathy was found to have evidence of liver pathology consistent with ragwort poisoning (diffuse fibroplasia, bile duct proliferation and megalocytosis). Examination of a mare presented due to sudden death revealed inflammation of the large intestine, possibly associated with nematode infestation. The third case had evidence of hydrothorax, mild hepatic fibrosis and associated biliary hyperplasia. Equine infectious anaemia (EIA) testing was negative.



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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 VLA, which acts as the reference laboratory.

**We would welcome feedback including contributions on focus articles  
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