AHT / BEVA / DEFRA
Equine Quarterly Disease Surveillance Report

Volume: 13, No. 4
Oct. – Dec. 2017

Highlights in this issue:

- News Article – Launch of a new pilot protocol for the control of contagious equine metritis (CEM) in England, Scotland and Wales
- An update from the International Collating Centre
- Focus Article – Working together to break the Strangles-hold: the latest thinking on *Streptococcus equi*
- Grass sickness surveillance data – Summary of 2017

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

Welcome to the fourth 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 focused insight into the occurrence 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 since 1st January 2018

National Disease Occurrence

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

On 2 January 2018, the Animal Health Trust (AHT) confirmed a case of EHV-1 abortion on stud premises in Suffolk, England. The affected animal was a vaccinated Thoroughbred mare that was grouped with four other mares on the premises. Appropriate biosecurity measures, in accordance with The Horserace Betting Levy Board (HBLB) Codes of Practice, were implemented. The positive diagnosis was confirmed by post mortem examination and qPCR on fetal and placental tissues. An update three weeks later confirmed no further EHV-1 abortions had occurred.

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

On 19 January 2018, the AHT confirmed a case of EHV-1 respiratory infection in Sussex, England. The affected animal was an unvaccinated eight-year-old Warmblood that presented with poor performance and chronic lower airway disease. The diagnosis of EHV-1 infection is considered of undetermined clinical significance in this chronic case. The positive diagnosis was obtained by PCR on a bronchoalveolar lavage sample. Quarantine restrictions were imposed at the premises. On 23 January 2018, the Animal Health Trust confirmed two further cases of EHV-1 respiratory infection linked to this case. The affected animals were direct in-contacts with the first reported case. They were unvaccinated and displayed no clinical signs. The positive diagnoses were obtained by qPCR on nasopharyngeal swabs. There are 30 horses on the premises, with five in the direct in contact group. The total number of positive cases in this group is three, with the two others in this group testing negative by qPCR on nasopharyngeal swabs. Quarantine restrictions are continuing at the premises and all horses are being closely monitored.

EQUINE HERPES VIRUS-4 (EHV-4) ABORTION

On 4 January 2018, the AHT confirmed a case of EHV-4 abortion on a premises in Suffolk, England. The affected animal was an unvaccinated four-year-old non-Thoroughbred mare that presented with pyrexia and premature lactation one week prior to aborting. There is only one in contact gelding at the premises. The positive diagnosis was confirmed by post mortem examination and qPCR on fetal and placental tissues.

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

On 8 January 2018, the AHT confirmed a single case of EHV-4 infection on a premises in Northern England. The affected animal was an unvaccinated 13-year-old Shetland pony that presented with nasal discharge. After several days the animal was recumbent with an inability to stand and was subject to euthanasia on humane grounds. The positive diagnosis was obtained by qPCR on a nasopharyngeal swab. Quarantine restrictions were imposed at the premises and all horses were being closely monitored.

On 15 January 2018, the AHT confirmed a single case of EHV-4 respiratory infection on a premises in Suffolk, England. The affected animal was an unvaccinated 10-year-old non-Thoroughbred that presented with pyrexia. The positive diagnosis was obtained by qPCR on a nasopharyngeal swab. Quarantine restrictions have been imposed at the premises and all horses are being closely monitored.

On 23 January 2018, the AHT confirmed a single case of EHV-4 respiratory infection in Herefordshire, England. The affected animal was a recently acquired five-year-old non-Thoroughbred that presented with mucopurulent nasal discharge and lymphadenopathy and was improving. The positive diagnosis was confirmed by qPCR on a nasopharyngeal swab and the affected animal was isolated.

On 26 January 2018, the AHT confirmed a single case of EHV-4 respiratory infection in Sussex, England. The affected animal is a four-year-old stallion that presented with pyrexia and bilateral nasal discharge. The positive diagnosis was confirmed by qPCR on a nasopharyngeal swab and the affected animal has been isolated.

International Disease Occurrence

CONTAGIOUS EQUINE METRITIS (*TAYLORELLA EQUIGENITALIS*)

France
On 30 January 2018 Réseau d'Epidémio-Surveillance en Pathologie Equine (RESPE) reported a confirmed case of contagious equine metritis (CEM) on a premises in Calvados, France. The subclinical infection was detected based on bacteriology on a pre-mating genital swab taken from a 15-year-old Andalusian stallion. The positive result was confirmed by the Dozulé laboratory for equine diseases. The affected animal was imported to France in 2007 and has not been used for natural covering during that time. Treatment has been instigated and sampling will be repeated upon completion of treatment.

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

France
On 29 January 2018, RESPE reported a case of EHV-1 abortion in a mare in Orne, France. There have been three cases of abortion at this stud premises since mid-November 2017 and a fourth mare is displaying signs of pyrexia. The positive diagnosis was confirmed by PCR on fetal tissues by LABEO-Frank Duncombe, Normandy.

Germany
On 9 January 2018, the University of Hannover confirmed a single case of EHV-1 abortion on a premises in the Federal State of Nordrhein-Westfalen. The affected animal was a vaccinated Thoroughbred mare. The positive diagnosis was confirmed by post mortem examination and qPCR on fetal and placental tissues. Appropriate biosecurity measures, in accordance with HBLB Codes of Practice, were implemented. There are approximately 100 equines of different breeds and different types of use (leisure, sport, breeding) on the affected premises. Some of them have been regularly vaccinated against EHV, others not. The 12 pregnant broodmares on this premises, including two Thoroughbreds, are kept separately from all other horses.

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

USA
On 12 January 2018, the New York Racing Association reported a single case of EHV-1 infection in Belmont Park, New York. The affected animal presented with pyrexia and respiratory signs, but no neurological signs. The case is currently in isolation.

On 24 January 2018, The Pennsylvania Department of Agriculture reported a case of EHV-1 infection in a Standardbred horse at The Meadows Racetrack, Washington, Pennsylvania. The affected animal presented with no clinical signs. All exposed horses are being monitored daily for signs of disease.

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

USA
On 18 January 2018, the New Bolton Center, University of Pennsylvania, PA confirmed a case of EHV-1 neurological disease in a horse admitted to their large animal hospital. The affected animal presented with a transient low-grade pyrexia, developed neurological signs a couple of days later and was euthanased. All elective equine appointments were cancelled until further notice. Owners and referring veterinarians of horses still at the hospital were notified and full biosecurity precautions taken to protect hospitalized horses. The Maryland Department of Agriculture has imposed 21-day investigational hold and strict biosecurity measures on the Baltimore County farm of origin of the index case pending additional epidemiological and laboratory testing.

On 24 January 2018, The State Veterinarian in Virginia confirmed that a horse that had been exposed to a horse at New Bolton Center has tested positive for EHV-1. The infected animal is located on a small private sport horse farm in Albemarle County and presented with pyrexia. The farm in Albemarle County is currently under quarantine restrictions and all exposed horses are being monitored daily for signs of disease.

On 30 January 2018, The Oregon Department of Agriculture reported a case of EHV-1 in a seven-year-old Thoroughbred mare at Portland Meadows racetrack. The positive diagnosis was confirmed by PCR on a nasopharyngeal swab and the affected animal has been isolated. Appropriate biosecurity measures have been implemented and high risk horses are being closely monitored. The index case is non-febrile and in a stable condition.

EQUINE HERPES VIRUS–4 (EHV-4) RESPIRATORY INFECTION

France
On 18 January 2018, RESPE reported a single case of EHV-4 infection in Calvados, France. The positive diagnosis was obtained by PCR on a nasopharyngeal swab by LABEO-Frank Duncombe, Normandy. No further details about the case are available.

On 24 January 2018, RESPE reported a single case of EHV-4 infection in Charente, France. The affected animal was a four-year-old French Saddlebred mare that presented with pyrexia, nasal discharge and coughing. The premises is a riding school with 70 horses. The positive diagnosis was obtained by PCR on a nasopharyngeal swab.

EQUINE INFECTIOUS ANAEMIA (EIA)

France
On 2 January 2018, RESPE reported a case of EIA in Alpes Maritimes, France. The affected animal presented with clinical signs consistent with the disease and was euthanased. Appropriate prevention and control measures were instigated for the two in contacts.

On 18 January 2018, RESPE reported another case of EIA in Var, France. The outbreak is epidemiologically linked to the outbreak reported on 2 January 2018. The infected horse, a Saddlebred, has been euthanased and appropriate prevention and control measures will be instigated for the one in contact. The positive diagnosis was confirmed on 12 January 2018 by Ministère de l'Alimentation et de l'Agriculture et de la Pêche, France.

EQUINE INFLUENZA (EI)

Chile
On 23 January 2018, the World Organisation for Animal Health (OIE) reported an outbreak of EI in Metro. De Santiago, Chile. The index case presented on 8 January 2018. Affected animals are unvaccinated, subtype was confirmed as H3N8. Positive diagnoses were confirmed by PCR on nasopharyngeal swabs by Lo Aguirre (National laboratory). Surveillance and control measures are ongoing.

USA
On 12 January 2018, EI has been confirmed in a group of approximately 50 horses in Cochise County, Arizona. Personnel involved have been requested to place affected barns under quarantine. Vaccination status of exposed horses is unknown.

GLANDERS

Indonesia
On 30 January 2018, the Directorate General of Livestock and Animal Health Services of Indonesia reported a single case of glanders (*Burkholderia mallei*) in Dki Jakarta, Indonesia (Cengkareng Timur, Cengkareng, West Jakarta). The affected animal displayed no clinical signs and was confirmed seropositive to glanders by Western Blot by the Reference Laboratory in Jena, Germany. The case has been euthanased and bacteriological investigations to isolate the agent are under way. The affected premises is under quarantine and surveillance will continue. Please note that Melioidosis (*Burkholderia pseudomallei*) has been reported in Indonesia and could be a possible differential diagnosis. This case was tested as part of a serological survey being performed in this region in Indonesia with 600 out of 1157 horses being randomly sampled in July 2017.

A look at: Equine Herpes Virus-1 and Equine Herpes Virus-4 (EHV-1/-4)

EHV-1 and -4 are ubiquitous in the equine population with first exposure often occurring at less than two-years of age. A large proportion of cases can progress to a latent state and reactivate in the future, acting as a source of infection. Reactivation can be triggered by any factor that causes immunocompromise, such a stress.

Virus classification: Genus: Varicellovirus Family: Herpesviridae Group: I, double-stranded DNA

Transmission: EHV-1/-4 is contagious and is spread by direct horse-to-horse contact, indirectly by contaminated hands, equipment and tack and through aerosolisation of the virus within enclosed environments.

Clinical signs: Pyrexia, nasal discharge and coughing in the respiratory form of the disease but this form can frequently be subclinical. Abortion, stillbirth and early neonatal death in pregnant mares. Weakness, inco-ordination, ataxia, paralysis and difficulty urinating and defaecating may be seen in the neurological form. EHV-1 can be responsible for all possible presentations of the disease. EHV-4 mainly causes respiratory disease and only rarely has been reported to cause abortion or neurological disease.

Laboratory diagnosis: RT-PCR assay on nasopharyngeal swabs, foetal, placental and/or CNS tissues; viral isolation on the above samples or heparinised whole blood; immunohistochemistry on fetal, placental and/or CNS tissues; paired serology using CF test demonstrating four-fold increase in antibody titre and elevated CF antibodies in absence of recent EHV vaccination on a single sample.

Geographic distribution: Endemic and worldwide with the exception of Iceland.

Control: Movement restrictions, biosecurity and hygiene measures and laboratory clearance as outlined in HBLB Code of Practice (http://codes.hblb.org.uk/index.php/page/32)

Notifiable: Not in the United Kingdom.

Zoonotic Risk: None recognised.

Past focus articles reviewing EHV-1 and how to approach an outbreak can be found at:

http://www.aht.org.uk/skins/Default/pdfs/DEFRA_report_4Q_2015_0.pdf#page=14

http://www.aht.org.uk/skins/Default/pdfs/DEFRA_Vol13No3_Q32017.pdf#page=13

FOCUS ARTICLE

In this report we are pleased to include a focus article from the AHT's Dr Andrew Waller on the latest thinking on *Streptococcus equi*.

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.

Access to all of the equine disease surveillance reports can be made on a dedicated page on the recently updated AHT website at:http://www.aht.org.uk/cms-display/DEFRA_AHT_BEVA_equine_reports.html or via the BEVA website: https://www.beva.org.uk/Home/News-Views/Latest-News

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

News Article – launch of a new pilot protocol for the control of contagious equine metritis (CEM) in England, Scotland and Wales

Following an extended consultation between government veterinary authorities and the equine industry a new industry-organised CEM control protocol came into effect on 1st February 2018 in Great Britain, whilst CEM still remains a notifiable disease. There will be no change in the arrangements for control of CEM in Northern Ireland.

The principle of the protocol is to encourage compliance with the Horserace Betting Levy Board (HBLB) Code of Practice for the disease and involve Animal and Plant Health Agency (APHA) in cases of non-compliance. In practical terms this means that, when there is a suspect or confirmed case(s) of CEM, a horse owner or their representative will be invited to make use of an approved veterinary surgeon to deal with the case(s) in compliance with the detailed guidance in the HBLB CEM Code of Practice (http://codes.hblb.org.uk/index.php/). If the owner does not accept this invitation, follow up action will be taken by the APHA under The Infectious Diseases of Horses Order 1987, including the possible serving of animal movement restrictions.

Background

Contagious Equine Metritis (CEM), a venereal disease of horses caused by infection with the bacterium *Taylorella equigenitalis*, was first identified in the UK in 1977 associated with reduced fertility in infected Thoroughbred mares. CEM was effectively controlled by application of a detailed voluntary Code of Practice drawn up by the HBLB and became a notifiable disease in 1987 for which identification of the causal organism in a laboratory must be reported to the APHA. The last case of CEM in the UK was identified in Gloucestershire, England in 2012.

As a result of the Coalition Government's deregulation initiative in 2013 (the so-called 'red-tape challenge') the notifiable disease status of CEM was reviewed. The Thoroughbred Breeders' Association, the British Equine Veterinary Association (BEVA) and others in the equine industry highlighted the potential negative effect on compliance with the HBLB Code of Practice and trade risks associated with changing CEM's status. It was subsequently agreed that, CEM would retain it's notifiable disease status, but that more responsibility for the control of the disease in Great Britain should be undertaken by the equine industry.

New principles

A new pilot CEM control arrangement came into effect in England, Scotland and Wales on the 1st February 2018 and will be subject to ongoing review. Horse owners or their representatives will be able to elect to have most of the work dealing with both suspect and confirmed cases of CEM carried out, not by APHA veterinary surgeons, but by equine veterinary surgeons on the approved list following the CEM control guidance provided in the HBLB Code of Practice.

The Animal Health Trust (AHT) will have a central role in the new arrangement, coordinating the activities undertaken by the approved vets, receiving reports, initiating tracings off the premises and being responsible for any epidemiological investigations.

BEVA will hold a list of suitably qualified equine veterinary surgeons approved to undertake the work ("the approved list"). Approval will be based on their Official Veterinarian (OV) status relating to export certification, their current stud experience and their knowledge of the HBLB Code of Practice in relation to the provisions of the new CEM control protocol in Great Britain.

Role of approved veterinary surgeons in Great Britain

Where the presence of the CEM organism (CEMO; *Taylorella equigenitalis*) is suspected by a private BEVA approved laboratory on routine samples taken in Great Britain by a stud vet and confirmed by the APHA reference laboratory, disease will be confirmed in the normal way by the Chief Veterinary Officer (CVO) in the country where the disease has been identified. With the agreement of the owner or their representative the AHT will arrange for a veterinary surgeon from the BEVA approved list to deal with the case. The affected stud's attending veterinary surgeon may act as the approved veterinary surgeon so long as the veterinary surgeon is on the approved list.

After confirmation of disease the approved veterinary surgeon will visit the premises to carry out any necessary treatment and further sampling and to assess compliance with the HBLB Code of Practice and evaluate any need for tracings. In complying with the HBLB Code of Practice voluntary movement and breeding restrictions will be implemented immediately and where necessary tracings will be initiated by the AHT on the advice of the approved

veterinary surgeon dealing with the outbreak. Formal action by APHA under The Infectious Diseases of Horses Order 1987, such as the formal serving of movement restrictions, will not ordinarily be necessary unless the owner fails to meet the requirements of the HBLB Code of Practice, as assessed by the approved veterinary surgeon. The costs of the subsequent treatment and re-sampling by the approved veterinary surgeon will continue to be borne by the owner in accordance with usual practice.

Invitation for inclusion on the BEVA list of approved veterinary surgeons

Veterinary surgeons in Great Britain that would like to support the industry by applying to join the list of equine veterinary surgeons available to investigate any future cases of CEM in England, Scotland or Wales are requested to contact BEVA at info@beva.org.uk

BEVA will provide an application form that will ask the veterinary surgeon to confirm that they have the necessary expertise to go on the list. There will be no extra training required, nor will BEVA make any charge. Veterinary surgeons do not have to be BEVA members to apply to join the approved list.

VIROLOGY

disease report for the fourth quarter 2017

The results of virological testing for October to December 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). No equine viral notifiable diseases have been confirmed in the UK during this fourth quarter of 2017.

Table 1: Diagnostic virology sample throughput and positive results for the fourth quarter of 2017

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
Serological Tests			
EVA ELISA	1233	30#	6
EVA VN	270	89#	3
APHA EVA VN	993	20#	1
EHV-1/-4 CF test	331	0*	1
EHV-3 VN test	1	0	1
ERV-A/-B CF test	51	0*	1
Influenza HI test	96	0	1
EIA (Coggins)	120	0	3
EIA ELISA	302	0	4
APHA EIA (Coggins)	1619	0	1
APHA WNV (cELISA)	1	0	1
Rotavirus ELISA	3	0	1
Virus Detection			
Coronavirus PCR	23	0	3
EHV-1/-4 PCR	589	21	5
EHV-2 PCR	34	2	1
EHV-5 PCR	8	1	1
Influenza NP ELISA	0	0	0
Influenza Directigen	0	0	0
Influenza PCR	235	3	3
APHA Influenza PCR	227	0	1
Influenza VI in eggs	2	0	1
EHV VI	14	6	2
EVA VI/PCR	1	0	1
APHA EVA VI/PCR	2	0	1
Rotavirus PCR	2	0	1
Rotavirus faecal strip test	3	0	1

ELISA = enzyme-linked immunosorbent assay, VN = virus neutralisation, CF = complement fixation, HI = haemagglutination inhibition, Coggins = agar gel immune diffusion test, PCR = polymerase chain reaction, NP = nucleoprotein, VI = virus isolation, EVA = equine viral arteritis, EHV = equine herpes virus, ERV = equine rhinitis virus, EIA = equine infectious anaemia, WNV = West Nile Virus, # = Seropositives include vaccinated stallions, * = Diagnosed positive on basis of seroconversion between paired ser

Time period: 1 October to 31 December 2017

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

On 23 October 2017, the AHT confirmed a single case of EHV-4 respiratory disease in a horse among a group of 10 on a racing premises in Gwent, Wales. A two-year-old Thoroughbred filly presented with clinical signs that included coughing, nasal discharge, lymphadenopathy and pyrexia.

On 8 December 2017, the AHT confirmed a single case of subclinical EHV-4 respiratory infection on routine quarantine sampling among a group of five Thoroughbred mares on a premises in Oxfordshire, England. The case has no clinical signs and was maintained in isolation with contacts.

On 21 December 2017, the AHT confirmed a single case of EHV-1 and EHV-4 co-infection on a premises in Northern England. The affected animal was an unvaccinated six-year-old Thoroughbred that presented with pyrexia. Appropriate biosecurity measures, in accordance with HBLB Codes of Practice, were implemented.
For all of the above cases, the positive diagnoses were confirmed by qPCR on nasopharyngeal swabs.

EQUINE INFLUENZA (EI)

On 23 October 2017, the AHT confirmed a case of EI on a premises in Essex, England. The affected animal was a very recently imported four-year-old Irish Draft of unknown vaccination status that presented with nasal discharge, coughing and slight lymph node enlargement. The positive diagnosis was confirmed by qPCR on a nasopharyngeal swab.

HBLB Surveillance Scheme

Animal Health Trust can test a nasopharyngeal swab and paired blood samples from suspected cases of equine influenza **FREE OF CHARGE** in our diagnostic laboratories, funded by the HBLB.

Enter your details at http://www.aht.org.uk/cms-display/equiflunet_register.html to sign up and AHT will send you sampling kits, including swabs and submission forms.

Samples are vital for AHT to monitor genetic and antigenic changes in equine influenza viruses circulating in the UK. This information is used to guarantee vaccines are up to date with current circulating strains and to verify that preventative measures currently implemented at a national level are effective.

AHT encourage you to sample any suspect influenza cases. This surveillance scheme has been set up to establish influenza prevalence (as many go undiagnosed) and provide resultant real time updates on the equine flu status in the UK.

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, equine herpes abortion and equine herpes neurological disease in the UK via text message. Sign up to receive alerts at http://diseaseoutbreaks.merial.co.uk/

Time period: 1 October to 31 December 2017

EASTERN EQUINE ENCEPHALITIS (EEE)

Canada
Between 1 October and 31 December 2017, EEE was confirmed in two horses located in Canada.

USA
Between 1 October and 31 December 2017, EEE was confirmed in 23 horses located in the United States, with 10/23 in Wisconsin.

EQUINE HERPES VIRUS-1 (EHV-1) ABORTION

France
In December 2017, RESPE reported two separate cases of EHV-1 abortion, the first was on 6 December in Orne and the second was on 29 December in Nièvre. The positive diagnoses were confirmed by PCR on fetal tissues.

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

France
In October 2017, a single case of EHV-1 neurological disease was confirmed in Calvados, France, The affected animal was a non-vaccinated six-year-old male French Saddlebred sports horse that presented with signs of pyrexia, lethargy and ataxia. The positive diagnosis was confirmed by PCR on a nasopharyngeal swab.

In December 2017, three separate cases of EHV-1 neurological disease were confirmed in France. The first was a French Saddlebred mare on a stud farm of 80 horses in Calvados. The case presented with clinical signs of ataxia and recumbency. A separate case was confirmed in Calvados, France, that presented with ataxia. The third case was a seven-year-old Thoroughbred mare that presented with ataxia in Alpes-Maritimes, France.

USA
Seven outbreaks of EHV-1 neurological disease were reported in the USA for this quarter.

In October 2017, The Kentucky Department of Agriculture confirmed a case of EHV-1 neurological disease in a Thoroughbred mare at a training facility in Oldham County. The horse presented with acute neurological signs and was euthanased. No other horses on the premises developed the disease.

In November 2017, The New Jersey Department of Agriculture confirmed a case of EHV-1 neurological disease in a 25-year-old Quarter Horse in Warren County, which was euthanased. A separate case was confirmed in Coos Bar, Oregon that involved a 12-year-old mare. The Pennsylvania Department of Agriculture confirmed a single case at a dressage barn in Butler County, Pennsylvania.

In December 2017, three outbreaks of EHV-1 neurological disease were confirmed. One case was a four-year old Quarter Horse mare at a private facility in Bethany, Connecticut. Clinical signs included; pyrexia, inappetence, hind limb ataxia and urine dribbling. Around 35 horses were exposed and all horses were up to date on vaccinations. The second outbreak was at a private facility in Champaign County, Illinois. Two cases were confirmed positive by The University of Illinois Veterinary Diagnostic Laboratory. There were 24 animals at the facility and five presented with pyrexia and hind limb swelling. The index case was a 28-year-old Quarter Horse mare that became recumbent and was euthanased. The third case was confirmed by the Washington State Department of Agriculture in King County, Washington. The index case was a 13 year old Haflinger gelding. Thirty-seven out of 60 horses at the premises were tested and 16 horses were confirmed positive for EHV-1 neuropathogenic strain by the Washington State Department of Agriculture. Clinical signs included; pyrexia, hind limb ataxia, absence of tail tone and urine dribbling. Seven horses were euthanased.

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

Germany

On 19 December 2017, University Equine Hospital Gießen confirmed a single case of EHV-1 infection in Hessen, Germany. The case was a 20-year-old mare that presented with mild pyrexia.

EQUINE HERPES VIRUS-4 (EHV-4) ABORTION

Belgium

On 22 December 2017, Equi Focus Point Belgium reported a case of EHV-4 abortion on premises in Kasterlee, Belgium. The affected mare was eight-months pregnant and unvaccinated. The positive diagnosis was confirmed by PCR on fetal tissues.

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

Belgium

Between November and December, Equi Focus Point Belgium reported two separate outbreaks of EHV-4 respiratory disease. The first was an unvaccinated mare in Saint Nicolas region. The second presented with pyrexia and respiratory signs and was unvaccinated. Confirmation was by PCR on nasopharyngeal swabs.

France

Table 2: EHV-4 respiratory disease outbreaks in France for the fourth quarter. Source - RESPE

French department	*Report Date*	*Clinical signs*	*Vaccinated*	*Total affected*	*In-contacts*	*Sample*	*Diagnostics*
Pyrenees-Atlantiques	19 October	ND Pyrexia	NK	1	NK	NP swab	qPCR
Calvados	23 October	NK	NK	NK	NK	NP swab	qPCR
Orne	27 October	NK	NK	NK	NK	NP swab	qPCR
Charente	15 November	Nasal discharge Cough Pyrexia	No	4	12	NP swab	qPCR
Calvados	22 November	ND Pyrexia	NK	1	NK	NP swab	qPCR
Ille-et-Vilaine	23 November	NK	NK	NK	NK	NP swab	qPCR
Manche	29 November	ND Pyrexia	NK	4	NK	NP swab	qPCR
Finistere	29 November	Lethargy Pyrexia Ataxia	No	2	60	NP swab	qPCR
Ain	30 November	ND Pyrexia	NK	1	NK	NP swab	qPCR
Calvados	30 November	Pyrexia	NK	1	NK	NP swab	qPCR
Orne	30 November	NK	NK	1	NK	NP swab	qPCR
Ain	6 December	NK	NK	1	NK	NP swab	qPCR
Calvados	6 December	NK	NK	1	NK	NP swab	qPCR
Orne	11 December	NK	NK	1	NK	NP swab	qPCR
Puy-de-Dome	11 December	ND Cough Pyrexia	NK	3	8	NP swab	qPCR
Calvados	11 December	ND Pyrexia	NK	NK	NK	NP swab	qPCR
Loire-Atlantique	18 December	ND Cough Pyrexia	No	1	30	NP swab	qPCR
Calvados	22 December	NK	NK	1	NK	NP swab	qPCR
Manche	22 December	NK	NK	1	NK	NP swab	qPCR
Côtes-d'Armor	29 December	ND Pyrexia	No	1	-	NP swab	qPCR

NK= not known, ND = nasal discharge NP = nasopharyngeal, qPCR = quantitative polymerase chain reaction

EQUINE INFECTIOUS ANAEMIA (EIA)

Canada
Between 1 October and 31 December 2017, there were a total of five EIA positive equines identified in the provinces of Alberta (four cases) and Quebec (one case). The positive animals were located on four separate premises, Alberta (three premises) and Quebec (one premises). One of the animals identified in Alberta was exhibiting significant signs of clinical disease and died shortly after sampling. The investigation on that premises continues as additional cases (non-clinical), have been identified during disease investigation. The other Alberta and Quebec cases were tested to comply with either export requirements or domestic movement requirements (i.e. private premises pre-entry). None of those cases were found to be linked and no signs of disease were reported at the time of sampling. The confirming laboratory was CFIA's National Reference Laboratory for EIA.

USA
Between 1 October and 31 December 2017, there were a total of three EIA positive premises identified in the states of Tennessee (one horse), Kansas (two horses) and Montana (multiple horses). The two horses in Kansas were confirmed positive following a 60 day re-test of all horses on a premises under quarantine following an outbreak in August 2017. The remaining horses will be re-tested after 60 days and remain under quarantine until all are confirmed negative.

During 2017, Texas Animal Health Commission (TAHC) confirmed EIA in 23 Quarter Horses, one Thoroughbred and one Paint horse.

EQUINE INFLUENZA (EI)

USA
In December 2017, EI was diagnosed in a vaccinated Arabian gelding in Fort Valley, Georgia. It exhibited the typical clinical signs of the disease.

WEST NILE VIRUS (WNV)

Canada
In October, The Ontario Ministry of Agriculture, Food and Rural Affairs reported six separate cases of WNV in Bruce, Simcoe, Durham, Grey, Sudbury District and the Regional Municipality of Niagara. The horses included four geldings and two mares and ranged in age from two- to 15-years-old. Three of the horses have been euthanased and three were recovering under treatment. Five of the horses had not been vaccinated and the vaccination history of the sixth animal was unknown.

In mid-October, three further cases of WNV were diagnosed in Ontario, Canada, bringing the total annual number of cases in Ontario to 21. The trio included a filly, a gelding and a mare located in Oxford, Frontenac and the Regional Municipality of Halton. Ages ranged from two to 11-years-old. Clinical signs varied from weakness of the hind quarters, muscle fasciculations, hyperesthesia and ataxia. One horse had been vaccinated annually since it was two years old, one had not been vaccinated for three years, and the final horse was unvaccinated.

Portugal
On 9 October 2017, the World Organisation for Animal Health (OIE) reported a single clinical case of WNV infection in a horse in the Alcacer do Sal area of Alentejo region of south west Portugal. The case was on a premises containing 42 susceptible animals with the positive diagnosis confirmed using serum IgM-capture ELISA at the National Institute for Agrarian and Veterinary Research, the national laboratory in Portugal. Control measures included ongoing surveillance, vector control and adoption of voluntary vaccination in the affected area. WNV had last been confirmed in Portugal in November 2016.

USA
A total of 68 cases were diagnosed in 15 states in the fourth quarter for 2017. The majority of cases had either not been vaccinated or had an unknown vaccination history.

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

An international perspective on equine disease surveillance:

the International Collating Centre

The concept of the International Collating Centre (ICC) to disseminate equine infectious disease information was initiated at the International Thoroughbred Breeders' Meeting held in the USA in October 1986 and was established at the AHT on 1st January 1987 and has been operating continuously since then.

The ICC currently has 23 countries registered to report to it under the umbrella of the International Thoroughbred Breeders' Federation. AHT disease surveillance staff also regularly monitor other equine surveillance resources, which include sites registered for e-mailed alerts e.g. French-based RESPE system, Defra's preliminary outbreak and qualitative risk assessments, the OIE's WAHID system and the American Equine Disease Communication Center. Interim ICC reports are collated on the ICC's website (http://www.aht.org.uk/icc/linksicc.html) and on a quarterly basis the ICC also prepares summaries of additional submitted data.

If you would like to be registered to receive reports please contact, maire.obrien@aht.org.uk

BACTERIOLOGY

disease report for the fourth quarter of 2017

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. No equine bacterial notifiable diseases have been confirmed in the UK during this fourth quarter of 2017.

Table 3: Diagnostic bacteriology sample throughput and positive results for the fourth quarter 2017

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
CEM (HBLB) PCR	500	0	10
CEMO (HBLB) culture	1157	0	18
CEMO (APHA) PCR	16	0	1
CEMO (APHA) culture	5820	0	1
Klebsiella pneumoniae PCR[1]	317	0	10
Klebsiella pneumoniae culture[1]	1366	1	20
Pseudomonas aeruginosa PCR[1]	302	1	7
Pseudomonas aeruginosa culture[1]	1396	9	22
Strangles* culture	818	43	17
Strangles* PCR	1679	90	7
Strangles ELISA[2]	5515	575	7
Salmonellosis	271	6	14
APHA Salmonellosis[3]	12	11	1
MRSA**	229	4	7
Clostridium perfringens	117	5	4
Clostridium difficile (toxin by ELISA or imunochromatography)	166	9	5
Borrelia (by ELISA)	18	1	3
Rhodococcus equi (culture/PCR/ELISA)	57	20	5
Rhodococcus equi (immunochromatography)	0	0	0
APHA *Burkholderia mallei* (Glanders)	0	0	0
*Lawsonia intracellularis**** *(culture/PCR)*	228	69#	4

CEM = contagious equine metritis (*Taylorella equigenitalis*), HBLB = HBLB approved laboratories, # = capsule type 1,2,5, Strangles* = *Streptococcus equi,* **MRSA = methicillin resistant *Staphylococcus aureus*, *Lawsonia intracellularis**** = *Lawsonia intracellularis* identified using PCR applied to faeces or serum or Immunoperoxidase monolayer (IPMA) and/or ELISA assay, PCR/culture[1] = reproductive tract samples only, Strangles ELISA[2] = seropositivity may be attributed to disease exposure, vaccination, infection and carrier states, Salmonellosis[3]= Under 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. # = Seropositives include vaccinated animals

APHA *Salmonella* results

Twelve samples were submitted this quarter to the Animal and Plant Health Agency (APHA) and eleven of these were positive for *Salmonella*. From the incidents involving isolates typed by the APHA, the serovars/phagetypes reported were *S.* Typhimurium (4 samples; 2 DT104, 1 DT193 and 1UNTY), *S.* Agama (2 samples), *S.* Teddington (2 samples) and single incidents of *S.* 4,12:i:- DT193, *S.* 4,5,12:b:- and *S.* Paratyphi B variant Java. *Salmonella* Typhimurium DT104 is likely to be of human or cattle/sheep origin whereas *S.* Typhimurium DT193 and monophasic *S.* Typhimurium 4,12:i:- are primarily found in pigs. *S.* Agama is usually associated with badgers and *S.* Paratyphi B variant Java and *S.* 4,5,12:b:- (which is likely to be an untypeable isolate of *S.* Paratyphi B variant Java) are likely to be associated with contaminated imported feed ingredients that have been exposed to reptiles during production or storage.

Salmonella – All isolations of *Salmonella* from horses are reportable to APHA.

Under the Zoonoses Order 1989, the responsibility for reporting the isolation of *Salmonella* was placed on the laboratory carrying out the examination. In practice, reports of *Salmonella* isolations must be made to the Nominated Officer at one of the Veterinary Investigation Centres of the APHA or to a Regional Veterinary Lead in Scotland. A culture of the organism must be made available on request. Samples are typed by the APHA to classify serovars/phagetypes.

For more information from APHA about *Salmonella* in Great Britain, please see the 2016 *Salmonella* in livestock surveillance report https://www.gov.uk/government/publications/salmonella-in-livestock-production-in-great-britain-2016

INTERNATIONAL BACTERIAL DISEASE OCCURRENCE

Time period: 1 October to 31 December 2017

CONTAGIOUS EQUINE METRITIS (CEM)

France
CEM was confirmed in a single animal in Saone-et-Loire, France. The subclinical infection was detected in a pre-export genital swab taken from a yearling Thoroughbred filly. The filly had never been bred and the cause of the infection remains unknown.

PIGEON FEVER (*Corynebacterium pseudotuberculosis*)

USA
Three cases of Pigeon Fever were reported by The Washington State Department of Agriculture near Duvall and Carnation in King County. The affected animals include a 15-year-old Paint gelding, a 14-year-old Haflinger-cross gelding and a 25-year-old Tennessee Walking Horse.

POTOMAC HORSE FEVER (Equine Neorickettsiosis)

USA
Two cases of Potomac Horse Fever were diagnosed in horses in Lewis County, Washington State.

SALMONELLOSIS

Singapore
Two cases of Salmonella were reported in two horses imported from Japan. Both animals had severe diarrhoea and clinical signs of endotoxaemia soon after entering post-arrival quarantine. The animals were treated symptomatically and despite a very low white blood cell count, recovered without further complications.

FOCUS ARTICLE

Working together to break the Strangles-hold: the latest thinking on *Streptococcus equi*

Dr Andrew S. Waller, Head of Bacteriology, Animal Health Trust

A workshop was held at the Animal Health Trust, Newmarket in October 2017. In attendance were industry bodies, researchers and vets. The workshop involved discussion about the current research into how strangles manages to spread on a global scale and prevention methods including new vaccine developments. This focus article summarises some of the key discussion points from the workshop.

Strangles, caused by a bacterium called *Streptococcus equi* (*S. equi*), is one of the most frequently identified infectious diseases of horses worldwide. More than 600 outbreaks of Strangles are diagnosed in the UK each year. Infected horses typically develop fever followed by abscesses in the lymph nodes of their head and neck. These abscesses are painful and the affected horses will often lose their appetites and become depressed. Some horses can be badly affected during an outbreak and the disease kills around one in a hundred animals. The bacteria can spread quickly through yards via contaminated drinking water, food, tack, equipment and people. Some outbreaks can involve all of the horses on a yard and all outbreaks require voluntary movement restrictions that usually remain in force for over 2 months. Consequently, Strangles is responsible for considerable economic and welfare cost. This article will provide an update on the progress being made towards eradicating Strangles and highlight what we can each do to keep our horses safe.

Streptococcus equi subspecies *equi* (Strangles)

Bacterial classification: Gram-positive cocci

Transmission: Strangles is contagious and is spread by direct horse-to-horse contact and indirectly by fomites. Shedding starts 2-3 days post infection and the bacteria can survive in the environment for extended periods.

Clinical signs: Can vary depending on previous exposure of the individual horse. Classical acute disease clinical signs include; pyrexia (often >39˚C), lethargy, lymphadenopathy and/or abscessation (mandibular and retropharyngeal lymph nodes most commonly) and bilateral mucopurulent nasal discharge. Mature horses with immunity from previous exposure may have a milder version called atypical/catarrhal strangles with mild, short-lived clinical signs. Possible to have carriers with bacteria held in chondroids in the guttural pouch, act as a shedder with intermittent to no clinical signs.

Laboratory diagnosis: RT-PCR assay on nasopharyngeal swabs, abscess material or guttural pouch lavage. Culture of samples alongside PCR if required. A set of three nasopharyngeal swabs taken seven days apart or a one off bilateral guttural pouch lavage will diagnose >90% of positive cases. Serological methods involve an ELISA and a single positive sample indicates exposure at some point, a paired sample with a rising titre indicates current exposure but further testing, as discussed above, is required to establish infection status. Interpretation of serological results must be in context of the clinical scenario.

Geographic distribution: Endemic and worldwide with the exception of Iceland

Control: Movement restrictions, biosecurity and hygiene measures and laboratory clearance as outlined in HBLB Code of Practice (http://codes.hblb.org.uk/index.php/page/99)

Notifiable: Not in the United Kingdom

Zoonotic Risk: None recognised

An age-old problem:
Strangles was first described in 1251 by Jordanus Rufus, a knight of Emperor Fredrick II. The disease was seen as inevitable and better for horses to fall ill sooner rather than later to get the disease over and done with. In 1811 Napoléon, Emperor of France, wrote a letter to request that the 543 horses being sent to his army should be *"at least 60 months of age and should already have recovered from Strangles"* so that they would be less likely to fall ill from this disease on the battlefront. More than 200 years later, many people still believe that it is inevitable that their horse will suffer from Strangles sooner or later. However, we understand so much more about the disease today and really can significantly reduce the risk of horses falling ill.

The secret to Strangles' success:
Once *S. equi* is drunk or eaten by a horse, it sticks to the surface of the horse's mouth or nose and then travels through to the lymph nodes in the horse's head and neck, where it can be detected only two hours later. Although the horse's immune response detects *S. equi* in the lymph node, the Strangles bacteria is very resistant to attack from the horse's immune system. Indeed, recent evidence shows how *Streptococcus equi* can exploit this unsuccessful immune response to turn the lymph node into an abscess, which effectively serves as a nutrient soup in which the bacteria thrives. The abscesses burst and enable *Streptococcus equi* to spread to other susceptible horses. However, the main trick up the sleeves of *Streptococcus equi*, is its ability to hide away in the guttural pouches of horses after they have recovered from Strangles, see figure 1.

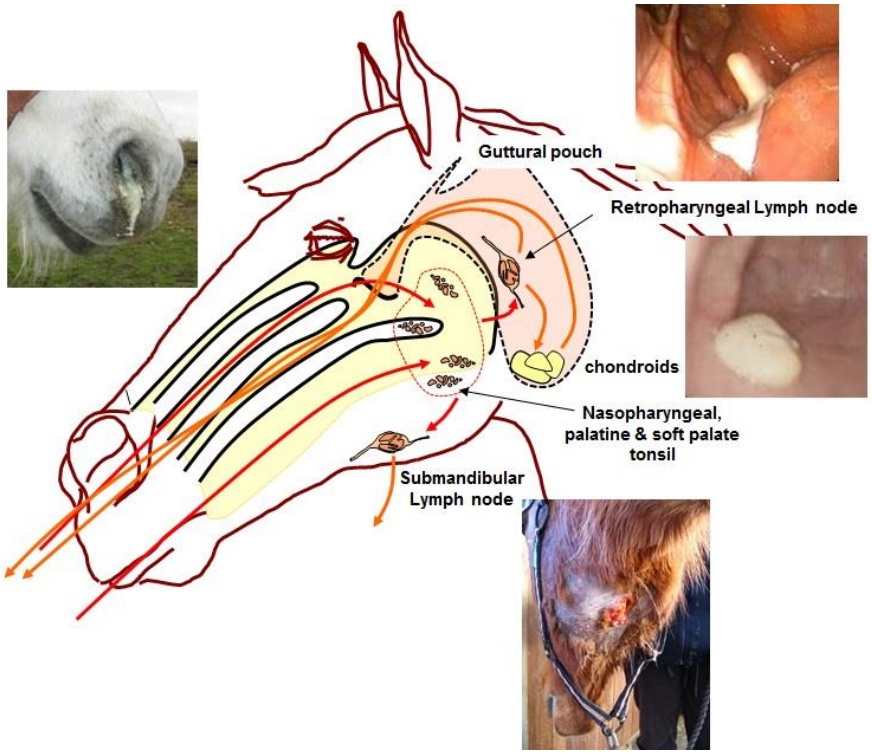

Figure 1: Lifecycle of *Streptococcus equi*

These 'carrier' horses look completely healthy, but intermittently shed *Streptococcus equi* triggering new outbreaks. A carrier can shed millions of Strangles bugs into a water trough just from having a quick sip. This number of bugs is sufficient, in theory, to infect and cause Strangles in thousands of horses. Therefore, the identification and treatment of carrier horses is extremely important if new outbreaks of Strangles are to be prevented.

Keeping Strangles out:
Only the geographically isolated population of 80,000 horses in Iceland remain free of Strangles, a situation that has been maintained through a virtual absence of horse import for over 1,000 years. The absence of Strangles in Iceland highlights a key problem faced by every other country: the national and international movement of horses. The horse is a global traveller, journeying throughout the world for competition, training, breeding, events or sales. Although pre-movement and pre-export veterinary checks can prevent the transport of obviously ill horses, carrier horses look completely healthy and cannot be identified through this standard examination.

An unwanted hitchhiker:
The way in which *Streptococcus equi* hitchhikes around the world in carrier horses has been highlighted in a recent study at the Animal Health Trust. In this study the DNA of 703 strains of *Streptococcus equi* from horses in 22 countries across the world was examined in great detail. The results showed that the same specific types of *Streptococcus equi* were recovered from horses in Europe and the USA; the USA, Europe, Japan and Israel; Europe and Australia; Australia, New Zealand and the United Arab Emirates; and Argentina, Europe and the United Arab Emirates. Essentially, wherever horses were moved, then the Strangles bacteria could travel with them. In particular, horses in the United Arab Emirates shared 14 different types of *Streptococcus equi* with countries from all around the world.

Breaking the chain:
Realising that current pre-export checks were insufficient; the United Arab Emirates have taken a proactive response and now insist on the mandatory screening of horses pre-export to identify Strangles carriers. Initially, horses are screened using the Strangles blood test to identify those that have been recently exposed to Strangles. Positive horses are then examined more closely to see if they are actually still infected with *Streptococcus equi*. If they aren't, then the horse can still be exported. If they are, then the carrier horse can be treated and cleared of *Streptococcus equi* before it is exported. Screening in this manner identified four new carriers of *S. equi* in 2016/2017 prior to export, which likely prevented the occurrence of several new outbreaks. In the future, this type of pre-export or movement screen could also help to prevent outbreaks in the UK and elsewhere in the world. Quarantining new arrivals for three to four weeks also helps to reduce the risk of Strangles, and other diseases, getting in. New horses should be kept away from resident horses and not share drinking water or tack. Taking temperatures each day can flag up horses during the first stages of disease so that vets can stop further spread of disease as quickly as possible.

Dealing with an outbreak:
If a Strangles outbreak does start, then the 'traffic-light' system of control is an effective way to minimise its impact. In this system, infected animals with clinical signs (Red group) are separated from healthy animals they had contact with (Amber group) and from horses (Green group) that have no clinical signs and that had no contact with horses in the Red or Amber groups. This method minimises the dose of *Streptococcus equi* that horses receive and will reduce the severity of disease and enable horses to recover from Strangles as quickly as possible.

It is really important to try and minimise the spread of the Strangles bacteria during outbreaks by using strict quarantine and hygiene measures. Virkon and Safe4 disinfectants are known to kill *Streptococcus equi* and can be used to disinfect equipment and stables as required.

Giving Strangles the boot:
Around one horse in ten that recovers from Strangles become carriers of *Streptococcus equi* with the potential to trigger new outbreaks each year. So, around four weeks after they recover, horses can be checked using guttural pouch endoscopy, where a small camera is placed into the guttural pouch, to see if any *Streptococcus equi* remain hidden away. Carriers can then be treated by physically removing any lumps of bacteria and treating horses with a dose of antibiotics. Flushing the guttural pouches of horses immediately after they recover from Strangles might help to minimise the number that become carriers and need treatment.

Horses in the amber and green groups should be tested using the Strangles blood test to see if any of them were exposed to *Streptococcus equi* during the outbreak. Horses that test positive with the blood test can then be checked with guttural pouch endoscopy to see if they are carriers and if so, be treated as described above.

Preventing Strangles by vaccination:
Horses will always travel to events where they can potentially be exposed to *Streptococcus equi*. The risk of exposure can be reduced by taking separate tack and equipment to minimise contact with other horses and avoid them sharing drinking water. However, the use of vaccines could help to minimise the number of horses that develop Strangles even if they are exposed to the bacteria.

Several Strangles vaccines are produced around the world seeking to protect horses from Strangles. Cell-free vaccines such as Equivac S (Zoetis), Strepguard (MSD Animal Health) and Strepvax II (Boehringer Ingelheim) are available in Australia and the USA. These vaccines are based on surface extracts of *S. equi* cells, but little data on the protection they confer is available and so these vaccines are not available for use in Europe.

The Pinnacle IN live vaccine (Zoetis) is available in the USA, Canada and New Zealand. The vaccine is sprayed into the nose of horses and provides protection against Strangles. However, it was recently found that the vaccine strain was recovered from over 60% of the vaccinated horses that went on to suffer Strangles, suggesting that the vaccine itself was responsible for some outbreaks.

The only currently available Strangles vaccine in Europe is Equilis StrepE (MSD Animal Health). This vaccine is based on a different live strain of *S. equi* that is injected into the upper lip of horses. The vaccine protects horses from Strangles, but has a short-lasting effect and horses need to be vaccinated every three to six months. New results from Europe show that vaccination with Equilis StrepE interferes with the Strangles blood test. So vaccinated horses would be likely to trigger further pre-export/-movement checks.

The above vaccines were all developed many years ago, but the completion of the *Streptococcus equi* genome sequencing project launched new waves of research to make better vaccines against Strangles. The progress towards the launch of one of these new Strangles vaccine was described at the recent Dorothy Havemeyer meeting on Strangles in Montana, USA, during September 2017. The vaccine, called Strangvac, uses eight proteins from *Streptococcus equi*. Strangvac protected 95% of ponies from developing Strangles when tested two weeks after giving a third vaccine dose. The vaccine did not interfere with the Strangles blood test and was safe when given by intramuscular injection. However, protection decreased over a 2-month period and so it may be necessary to give horses a booster vaccination in the face of an outbreak or before they travel to high-risk events.

Improving vaccine protection:
New research at the Animal Health Trust, which is funded by the UK government's Biotechnology and Biological Sciences Research Council (BBSRC), is tasked with improving the level of protection that Strangles vaccines provide. The project will modify a protein that normally misdirects the immune response, so that it instead strengthens the immune response following vaccination. This modified protein will be fused to vaccine proteins to help the vaccines trigger stronger immune responses and better levels of protection. The project has the potential to solve a significant problem in the development of safe and effective vaccines that protect against Strangles. Furthermore, this technique, if successful could also be used to help design vaccines to protect other animals including pigs, cattle, sheep and humans.

The new research to improve vaccines against Strangles is finally reaching a point of delivering products that could enhance the health of our horses. We also know ever more about how the Strangles bacteria spreads and causes disease, enabling horse owners to employ simple precautions to minimise the risk of their horse falling ill. Strangles is no longer inevitable and we hope that the combination of better management, diagnostic tests and vaccines will gradually enable us to reduce the number of outbreaks of this disease around the world.

TOXIC AND PARASITIC

disease report for the fourth quarter of 2017

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 4: Diagnostic toxicosis sample throughput results for the fourth quarter 2017

	Number of Samples Tested	Number Positive	Number of Contributing Labs
Grass Sickness	14	5	3
Hepatic toxicoses	20	5	3
Atypical myopathy/Seasonal Pasture Associated Myopathy	2	2	1

Table 5: Diagnostic parasitology sample throughput and positive results for the fourth quarter 2017

	Number of Samples Tested	Number Positive	Number of Contributing Labs
Endoparasites			
Ascarids	3239	34	17
Cyathostomes	3032	1057	15
Dictyocaulus	32	2	1
Strongyles	3302	674	19
Tapeworms (ELISA serum)	502	231	1
Tapeworms (ELISA saliva)	4342	1482	1
Tapeworms (Faecal exam)	2261	15	10
Strongyloides	3432	149	19
Oxyuris equi	253	10	11
Fasciola	265	5	9
Coccidia	421	4	9
Cryptosporidia	22	1	5
Theileria equi (cELISA)	175	1	2
Babesia caballi (cELISA)	384	2	2
APHA *Theileria equi* (CFT)*	215	0	1
APHA *Theileria equi* (IFAT)**	343	6	1
APHA *Theileria equi* (cELISA)***	368	4	1
APHA *Babesia caballi* (CFT)*	215	0	1
APHA *Babesia caballi* (IFAT)**	343	6	1
APHA *Babesia caballi* (cELISA)***	368	1	1
Ectoparasites			
Mites	290	8	13
Lice	232	2	8
Ringworm	337	50	15
Dermatophilus	153	21	9
Candida	120	6	5

* = Complement Fixation Test - CFT suspect/positive samples are tested by IFAT test, ** = Indirect Fluorescent Antibody Test, *** = competitive Enzyme-linked immunosorbent assay - positive cELISA results are not undergoing confirmatory testing

TETANUS (*Clostridium tetani)*

There were two cases reported in Northern England. An unvaccinated Thoroughbred yearling was found recumbent with muscle spasms, flared nostrils, third eyelid protuberance, locked jaw and hypersensitivity. The second case was a 14-year-old non-Thoroughbred of unknown vaccination status. Diagnosis was based on clinical signs.

Grass sickness surveillance data Q4

(http://www.equinegrasssickness.co.uk/)

The nationwide Equine Grass Sickness surveillance scheme was established in spring 2008 to facilitate the investigation of changes in geographical distribution and incidence of the disease in Great Britain. Data gathered by this scheme is collated in a strictly confidential database.

A total of four cases of Equine Grass Sickness (EGS) were reported during the fourth quarter of 2017 (October – December), of which two cases occurred in October and two in December. Two cases were reported in Scotland, one in England and one case location was unreported. Of the four cases, one premises reported a prior history of EGS. The cases comprised of one gelding and three mares, with a median age of 5.5 years (range 5 – 21 years). Affected breeds were; two cobs, one Connemara and one Welsh Cob. Out of the four cases, three were diagnosed with acute EGS and the remaining case was unreported. Diagnostic information was provided for all reported cases, of which all were diagnosed based on veterinary assessment of clinical signs alone.

Monthly Occurrence of EGS and Case Distribution of EGS in 2017

Fifty cases of EGS occurred in 2017, of the 49 EGS cases where the type of disease was specified, 40% of cases presented as acute EGS (n=20), 26% as subacute EGS (n=13) and 32% as chronic EGS (n=16). Cases were reported to the nationwide surveillance scheme in every month aside from November. During 2017, there was a substantial increase in the frequency of cases reported during April and May, see figure 3.

Cases were reported in England (70%, n=35), Scotland (28%, n=14) and Wales (2%, n=1), see figure 4. Out of the 50 reported cases, 42% (n=21) of premises reported a prior history of EGS.

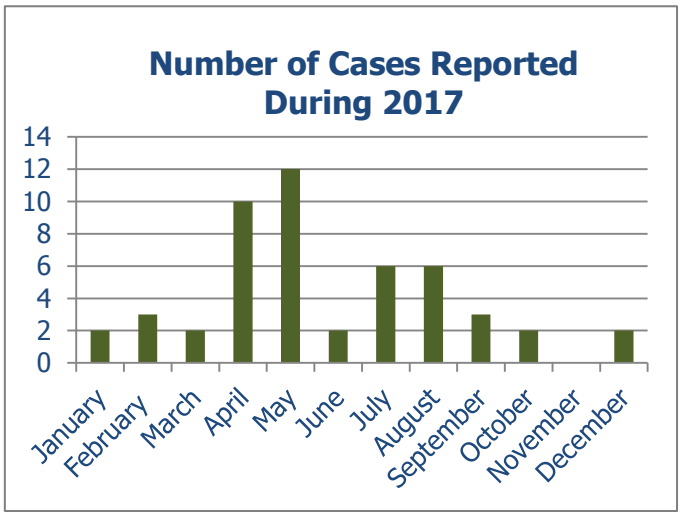

Figure 3: The monthly occurrence of cases of Equine Grass Sickness during 2017, in Great Britain, as reported to the nationwide surveillance scheme.

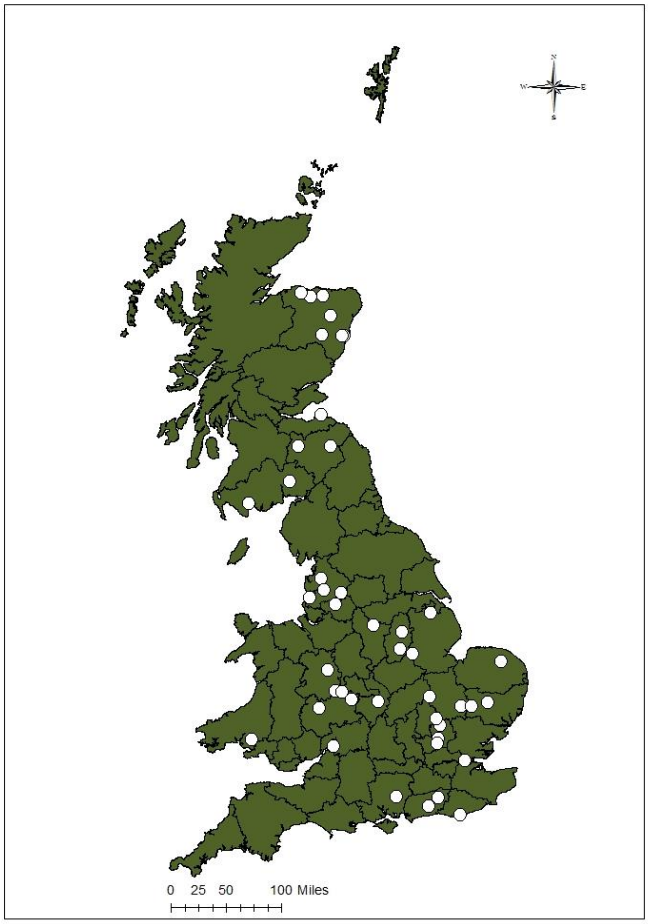

Figure 4 (Right): Map showing the distribution of cases of Equine Grass Sickness during 2017, in Great Britain, as reported to the nationwide surveillance scheme.

POST MORTEM EXAMINATIONS

report for the fourth quarter of 2017

The caseload of post-mortem examinations reported below have been obtained from three UK Veterinary Schools and five of the other contributing laboratories to this report.

East Anglia

A total of 83 cases were examined by post mortem.

A total of 71 aborted fetuses and fetal membranes were examined.

Table 6: Summary of post mortem findings for aborted fetuses in East Anglia for the fourth quarter 2017. PCR and histopathology was performed to exclude Equine Herpes Virus infection in all cases.

Post Mortem Diagnosis	Total	Comments
Umbilical cord torsion	35	Vascular compromise associated with cord twisting
Premature placental separation	2	Presumptive in one case with a placentopathy; demonstrating multifocal placental congestion and haemorrhage
Placentitis	12	Placentitis confirmed to be secondary to bacterial infection in 11 cases with aerobic cultures reported in eight cases isolating; *Klebisella pneumoniae* (n=1), *Escherichia coli* (n=1), *Enterococcus sp.* (n=3), *Bacillus sp.* and *Enterococcus sp.* (n=1), heavy growths of multiple bacteria including; *Streptococcus zooepidemicus*, *Proteus sp.*, *E. coli, Bacillus* sp. and *Enterococcus sp.* (n=1) and *Proteus sp., Streptococcus sp.* and *Enterococcus sp.* (n=1) One case was presumed fungal with histiocytic nodules and vascular thrombi, but no fungal agent was observed
Placental insufficiency	1	Small regions of placental fibrosis, small fetus; indicative of previous placental damage with resultant insufficient nutrient provision
Equine Herpes Virus	1	Confirmed by histopathology and PCR on fetal and placental tissues
Ischaemic necrosis of cervical pole	3	Associated with long cord length
Omphalocoele	1	Chronic placentopathy, in-utero growth retardation, excessive cord length, small intestinal obstruction, mild thoracolumbar scoliosis and malformed left caudal ribcage
No final diagnosis*	16	Infectious causes ruled out

*Where cases had no final diagnosis reached, hypotheses were made for each case with the intention for interpretation by the submitting veterinarian, relating post mortem findings to concurrent clinical history to affirm the most likely conclusion. For every post mortem, congenital and infectious cases have been ruled out. Examples of hypotheses included terminal placental ischemia or hypoxia and inflammatory causes. In several cases, no diagnosis could be reached due to severe autolytic changes precluding a final diagnosis.

Seven cases of gastrointestinal disease were examined which included a case of sudden death after a spontaneous gastric rupture. In another case, incarceration of the small intestine through defects in the broad ligament were identified in an in foal mare. These defects could either be congenital or as a result of trauma from a previous foaling.

Other cases included one animal with intestinal hyperammonaemia and secondary encephalopathy, another with chronic enteritis with a severe *Strongyloides westeri* burden and another case with haemorrhagic and necrotizing typhlitis of the caecum and active verminous arteritis (of the cranial mesenteric artery).

There were two separate cases of grass sickness examined. In one case, dilated small intestine and a large colon impaction were identified, with a suspicion of grass sickness as the diagnosis, final confirmatory results are pending. The second case had no further information reported.

One musculoskeletal case was examined and a diagnosis of osteoarthritis of the right hind made.

One neoplastic case was examined and a diagnosis of multicentric lymphoma with pleural and peritoneal effusions was made.

One welfare case was examined with clear pre-mortem evidence of emaciation and acute diarrhoea. At post-mortem there were suspect regions of damage to the intestinal mucosa but there was no evidence of intestinal parasites.

Another case of sudden death was investigated but no diagnosis was confirmed, toxicology was not performed.

One vascular case was examined and found to have acute rupture of the proximal right middle uterine artery, leading to peri-uterine haematoma formation and haemoabdomen.

Home Counties

A total of nine cases were examined.

One case of abortion was examined, fetal membranes were EHV-1 and -4 negative by qPCR.

Five cases of gastrointestinal disease were examined. These included a case of thickened, oedematous small intestine, awaiting histopathological confirmation of diagnosis. A case of ileal impaction. Another case investigated was found to have a fibrinonecrotizing and suppurative colitis associated with non-steroidal-anti-inflammatory administration. Two cases of peritonitis were diagnosed, one was found to be a fibrinous peritonitis associated with an open, draining wound in the scrotum. The other case was found to have a focal chronic-active suppurative and fibrosing peritonitis with an intralesional foreign body identified.

Three cases of musculoskeletal disease were examined. These included a case with a fractured frontal bone, a case of bilateral atrophy of the cricoarytenoideus dorsalis muscles and a fibrinosuppurative myositis (abscess).

One neoplastic case was examined and a diagnosis of phaeochromocytoma was made.

Scotland

A total of 13 cases were examined.

Seven cases of gastrointestinal disease were examined. These included a case with a gastric rupture and secondary peritonitis, another case with a small colon rupture and secondary peritonitis. Another case was found to have an impaction of the caecum and large colon, with grass sickness as the suspected diagnosis, histological results are in progress. Other cases investigated included a case of colonic impaction, a case of caecal haemorrhage, a case of caecal and colonic dilatation and a final case with a small colon impaction.

Four cases of musculoskeletal disease were examined. A fractured atlas and occipital bone were identified in one case. A myopathy was diagnosed in another case, in which there was widespread pallor and discolouration of skeletal muscles. Another case examined was found to have a metatarsal fracture and a final case was diagnosed with a deep digital flexor tendon injury.

Two neoplastic cases were examined. In one case, metastasis to multiple organs and bone was identified but no histological evaluation was performed. The other case is inconclusive, but a presumptive diagnosis of plasma cell tumour was made from a peri-mortem bone marrow aspirate.

Southern England
A total of eight cases were examined.

One cardiovascular case was investigated and found to have multifocal white masses infiltrating and expanding the myocardium of the ventricles. Histopathological findings included a multifocal lymphoplasmacytic infiltration with acute severe cardiac muscle biphasic necrosis. No definitive diagnosis was made.

Three gastrointestinal cases were investigated. One case was found to have chronic gastric ulceration. Another case was diagnosed with a right dorsal displacement of the large colon. The final case had an enlarged, firm, chalky pancreas and a diagnosis of pancreatitis was made.

One renal case was investigated and a ruptured renal abscess was identified.

Two cases of neoplasia were investigated in which one was confirmed to be metastatic adenocarcinoma. Another case, which presented with colic, was diagnosed with leiomyoma.

One respiratory case was investigated which identified diffusely firm lungs and a diagnosis of subacute, severe, diffuse, suppurative bronchopneumonia was made.

Northern Ireland
A total of two cases were examined.

One aborted fetus was examined in which no abnormalities were noted and no diagnosis was made. Results for Equine Herpes Virus and Leptospirosis were negative.

One musculoskeletal case was investigated in which muscle oedema, haemorrhage, mild acute interstitial myositis and myofibrillar necrosis was found. A diagnosis of Clostridial myositis was made.

ACKNOWLEDGEMENTS

This report was compiled by the Animal Health Trust.
We are extremely grateful to the following laboratories for contributing data for this report.

All laboratories contributing to this report operate Quality Assurance schemes. These schemes differ between laboratories, however, all the contagious equine metritis testing reported was accredited by the Horserace Betting Levy Board with the exception of the AHVLA, which acts as the reference laboratory.

Agri-Food and Biosciences Institute of Northern Ireland
Animal Health Trust Diagnostic Laboratory Services
Animal and Plant Health Agency
Austin Davis Biologics Ltd
Axiom Veterinary Laboratories Ltd.
Biobest Laboratories Ltd.
B & W. Equine Group Ltd.
CAPL LTD Laboratories
Carmichael Torrance Diagnostic Services
Chine House Veterinary Hospital
The Donkey Sanctuary
Donnington Grove Veterinary Group
Endell Veterinary Group Equine Hospital
Hampden Veterinary Hospital
IDEXX Laboratories
JSC Equine Laboratory
Lab Services Ltd.
Liphook Equine Hospital
Minster Equine Veterinary Clinic
NationWide Laboratories
Newmarket Equine Hospital
Oakham Veterinary Hospital
Rainbow Equine Hospital
Rossdales Laboratories
Royal Veterinary College
Sussex Equine Hospital
Three Counties Equine Hospital
Torrance Diamond Diagnostic Services (TDDS)
University of Edinburgh
University of Glasgow
University of Liverpool
Valley Equine Hospital

The Animal Health Trust (AHT) is extremely grateful to the Horserace Betting Levy Board (HBLB), Racehorse Owners Association (ROA) and Thoroughbred Breeders' Association (TBA) for their continued combined contribution to the AHT's Equine Infectious Disease Service.

EQUINE owners breeders betting levy infectious disease service

HORSERACE BETTING HBLB LEVY BOARD

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

Animal Health Trust
Lanwades Park, Kentford, Newmarket, Suffolk CB8 7UU
Telephone: 01638 750659 **Fax:** 01638 555659
Email:equinesurveillance@aht.org.uk **Website:** www.aht.org.uk

Animal Health Trust

Department for Environment Food & Rural Affairs