



DEFRA / AHT / BEVA EQUINE QUARTERLY DISEASE SURVEILLANCE REPORT Volume 3, No.4: October - December 2007



Highlights in this issue:

- Equine infectious disease control at public auctions
- Update on neurological form of equine herpes virus
- Leptospirosis associated abortion in the UK

Important note:

The data presented in this report must be interpreted with caution, as there is likely to be some bias in the way that samples are submitted for laboratory testing. For example they are influenced by factors such as owner attitude or financial constraints or are being conducted for routine screening as well as clinical investigation purposes. Consequently these data do not necessarily reflect true disease frequency within the equine population of Great Britain.



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Introduction

Welcome to the fourth 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.

As regular readers of this publication will know, 2007 has seen an increase in reported global equine influenza virus (EIV) activity. The 4th quarter of 2007 saw the continuation of the previously reported EIV outbreaks in Australia, Japan, and Mongolia. The outbreak in Australia is heading towards eradication at this time with no new cases having been identified since Christmas Day 2007. Many of the movement restrictions in New South Wales and Queensland have been relaxed and although restrictions remain in the most severely affected areas of these states, it is hoped that these will be lifted in the near future. The strain of influenza virus identified in Australia is of the sub-lineage American variant-American and therefore similar to virus identified in recent years in North America and South Africa (2003). This outbreak of equine influenza has had a major impact on the Australian equine industry and is being taken very seriously by the Australian government. A judicial inquiry is ongoing at this time to investigate circumstances contributing to the outbreak and the need for any strengthened biosecurity procedures for imported horses. Further information about the inquiry can be accessed at <http://www.equineinfluenzainquiry.gov.au>.

In Japan, the equine influenza virus outbreak that began in August 2007 is declining but sporadic cases are still occurring. A small outbreak among racehorses occurred in November 2007, however this was well controlled and only one sub-clinical case has been detected in a racehorse since that time. An outbreak of EIV among horses competing at the Japanese National Sports Federation in October resulted in cancellation of all equine events. This outbreak occurred despite pre-transport EIV testing via nasopharyngeal swab. Several small outbreaks related to this event occurred in the following time period but all are now resolved and only sporadic cases are being identified. Eradication of EIV in Japan is anticipated.

A large outbreak of EIV has been ongoing in Mongolia since late 2007. It is estimated that over 60,000 horses have been affected and more than 20 horses have died. Little is known about the strain of virus circulating in Mongolia at this time. Outbreaks of EIV also occurred in Kazakhstan and China (Xinjiang province) during 2007.

The EIV situation in the UK during the 4th quarter of 2007 is discussed in the virology section of this report.

Following a clinical case of West Nile Virus (WNV) being identified in the United Arab Emirates in August 2007 a serosurvey of 750 horses in 6 Emirates was performed using an IgM capture ELISA. The survey revealed 19.2% of the horses tested had antibodies to WNV. Only a single clinical case has been reported despite this high antibody prevalence. This suggests that the virus present in the UAE may be less virulent than the strain present in the USA where the occurrence



of clinical disease is much higher. Trapping and testing of birds and mosquitoes is being conducted to try to isolate and characterize the virus.

As reported in the last issue, atypical myopathy is becoming an increasing concern in Europe with an apparent increase in the number of cases seen. A severe outbreak occurred in Switzerland in the 4th quarter with 8 cases occurring on a total of three premises.

Equine infectious anaemia (EIA) has been identified in the Ardeche department of France during 2007, as previously noted in this report. During epidemiological investigation following outbreaks identified in autumn 2007, a further positive case was identified on a new premise (also in the Ardeche department). The positive horse had been in contact with animals from one of the previously identified affected premises in the summer of 2006. An epidemiological investigation to identify all at-risk horses is ongoing. Official EIA testing has also been occurring in central Germany since a single EIA case was identified in August 2007. No other positive cases have been identified in Germany and all restrictions have now been lifted.

BEVA have been working with Veterinary Ireland and the equine insurance industry to produce a guide to best practice for vets to consult in the event of euthanizing a horse covered by an 'All Risks of Mortality' insurance policy. This guide supplements the information found in BEVA's 1996 guidelines which were published to help vets dealing with emergency euthanasia. The new information is aimed to provide vets with guidelines to follow in a wider range of situations, including euthanasia of horses with chronic conditions. Further information is available at the BEVA website (<http://www.beva.org.uk>).

We are grateful to our contributors for providing focus articles for this report. David Dugdale has produced a useful article outlining the risks of infectious disease outbreaks at public auctions and the steps to take to minimise spread of infection should such a situation occur. An article focusing on the diagnosis and management of an outbreak of neurological herpes virus, written by Julie Ross, has also been included.

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 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.



Virology Disease Report for the Fourth Quarter of 2007

The results of virological testing for October - December 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 14 EVA VN positives detected by the VLA, 9 were among export samples, 3 from imports and the remainder were private requests. The 7 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
<u>Serological Tests</u>			
EVA ELISA	1852	62	1
EVA VN	588	24	4
VLA EVA VN	1779	14	1
EHV-1/-4 CF test	686	5	2
EHV-3 VN test	9	1	1
ERV-1/-2 CF test	358	0	1
Influenza HI test	413	10	1
EIA (Coggins)	231	0	1
<u>Virus Detection</u>			
EHV-1/-4 PCR	117	0	1
EHV-2/-5 PCR	0	0	0
Influenza NP ELISA	551	7	1
Influenza VI in eggs	7	5	1
EHV VI	294	2	1
EVA VI/ PCR	1	0	1
VLA EVA VI/ PCR	7	0	1
Rotavirus	10	0	2

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 Fourth Quarter of 2007

EHV-1 Abortion

Four cases of EHV associated abortion were reported during this quarter. All cases were in Thoroughbred mares. In all of the cases, PCR testing of foetus and placenta was negative for EHV-1 and EHV-4. Immunohistochemistry was performed in each case. The placenta gave a positive result in all 4 cases and the foetus was negative in all 4 cases. Two of the mares involved were known to be vaccinated against EHV and one mare was unvaccinated. The fourth mare had an unknown vaccination history,



EHV-1 Neurological Disease

No cases of EHV associated neurological disease were identified in this quarter.

EHV-1 Respiratory Disease

No significant outbreaks of EHV associated respiratory disease were identified in this quarter.

EHV-3 Coital Exanthema

One case of EHV-3 was identified in a donkey.

Equine Influenza

An increase in EIV activity in the UK was seen in the 4th quarter of 2007 with 7 premises being affected. All 7 premises were geographically isolated from one another. On two of the affected premises cases included vaccinated Thoroughbred horses. Virus characterisation of all available isolates was performed. This revealed one isolate (Lincolnshire/07) to be of the American variant-American lineage. This virus is thus similar to virus strains identified in North America, Australia and Japan in 2007 and to the best of our knowledge is the first isolate of this lineage identified in Europe. This highlights the importance of ongoing surveillance to allow the emergence and distribution of new EIV strains to be monitored. Other isolates identified in the 4th quarter 2007 were of the European variant American lineage, and similar to strains identified in the UK throughout 2007.



NEUROLOGICAL FORM OF EQUINE HERPES VIRUS: Diagnosis and management

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Neurological disease associated with Equine Herpes Virus (EHV) -1 was first reported in the 1970s. Neurological signs occur due to viral induced endothelial cell death within the endothelium of the central nervous system. This subsequently results in thrombosis within the vessels of the central nervous system and the associated clinical signs develop. There is no direct neuronal invasion or damage caused by the virus itself. Not all strains of EHV result in neurological disease. Investigation of the strains of EHV associated with neurological disease has led to the discovery of a variation in a single amino acid present on the DNA polymerase of EHV that is strongly associated with neurological disease. A PCR can be used to detect this variation and thus to differentiate strains that are considered neuropathogenic from those considered non-neuropathogenic. At present, this PCR is only available in the UK in a research setting; however it is commonly applied to commercial samples submitted to the Animal Health Trust. This allows rapid confirmation of the presence of the neuropathogenic strain of EHV in tissues or nasopharyngeal swabs.

When a case of neurological EHV is suspected, it is important that management changes occur to minimize any potential spread between horses on the affected premises and to decrease the chances of spread to other premises. It is also essential that appropriate diagnostics are performed to achieve a diagnosis as quickly as possible. Testing for the neurological form of EHV involves several complementary tests. If a fatality occurs, the whole carcass should be submitted for post mortem examination. Using a combination of histopathology, virus isolation and PCR, it is possible to diagnose EHV associated neurological disease. In the living horse, in the acute stage of disease, serology, virus isolation from whole blood and virus isolation from nasopharyngeal swabs should be performed. Serological testing involves complement fixation, and as with all serological testing, acute and convalescent sample are needed to demonstrate seroconversion (a 4 fold increase in titre). Virus isolation is ideally conducted on heparinised blood and nasopharyngeal swabs. Nasopharyngeal swabs should be transported in viral transport media. Virus isolation on cells is conducted and if the facilities are available, positive samples can then be tested via PCR. PCR allows the presence of the neuropathogenic strain of EHV to be demonstrated, which would obviously lead to a very high index of suspicion that the neurological disease is EHV associated.

EHV is spread via nasal secretions from infected horses (who may have no clinical signs of disease). Virus spread can be via direct transmission between horses (i.e. nose-to-nose contact) or via 'fomites' (i.e. water buckets, twitches, human hands/sleeves etc). If an abortion due to EHV occurs, the virus can also be transmitted from the foetus and placenta. Many horses carry herpes virus without showing any clinical signs. When a carrier horse mixes with others, the virus is easily spread. Effective quarantine can be achieved by managing horses in small groups and adhering to the guidelines outlined below. An outbreak of neurological herpes is a 'yard-wide' problem. It is not only a problem for the people whose horses are unfortunate enough to show clinical signs.

In the event of an outbreak of EHV, there should be immediate cessation of movement on and off the yard and any horses which have recently left the yard should be traced and their owners contacted to allow these horses to also be treated as 'in contacts'. Horses on



the yard should be managed in small groups according to whether or not they are showing clinical signs. These groups should be physically separate from one another. 'Isolation' should involve having separate people look after affected horses versus unaffected horses. If this is not possible, the affected horses should be dealt with last and handlers should aim to minimize the risk of cross contamination by wearing coveralls and disposable gloves, disinfecting shoes between affected/non-affected populations, washing hands between animals etc. It is essential that no equipment is shared between affected and unaffected horses i.e. twitches, buckets etc as all of these things can allow the virus to be transmitted. It should also be remembered that sleeves which reach the wrists also commonly become contaminated and act as a way for the virus to spread between horses. It is especially important that pregnant mares are handled separately from affected horses as infection of a pregnant mare can result in abortion.

It is important that owners realize that there are currently no vaccines available that protect horses against the neurological form of EHV. In addition, vaccination in the face of an outbreak is not recommended as it may potentiate the disease.

Once control measures are in place, testing of all in contact animals should occur to try to determine the extent of virus spread around the yard and also to determine, in the long term, when movement restrictions can be lifted. It is important to test in contact horses which appear healthy as these horses may be carrying EHV and can spread it to other horses. Initially, it is important to try to isolate virus from all horses (from heparinised blood and nasopharyngeal swab). It is also very important to perform serology as by monitoring seroconversion, we can identify which horses have been exposed to the virus and could therefore potentially be continuing to spread the virus despite the absence of clinical signs. Monitoring using serology is also important to determine when the virus is no longer circulating within the yard. It is of benefit to the yard in question to test all in contact horses as it allows it to be determined when it is safe to recommend movement of horses on and off the yard again. Ideally, two serum samples (14 days apart) should be taken from all affected and in contact horses. The information gleaned from this testing, along with information about vaccination status of horses, contact between horses on the yard etc, allows spread of virus around the yard to be monitored. Further testing is then conducted at 1-2 week intervals until it can be determined that virus is no longer circulating in the yard (i.e. no further seroconversions are seen).

It is understandable that owners sometimes become frustrated by movement restrictions and multiple tests being carried out on their horses, however these procedures are essential for the protection of horses both on the yard, and in the wider horse population. The recommendations regarding movement, testing etc are laid out in the BHLB Codes of Practice which are available at the BHLB website (<http://www.hblb.org.uk/>).



Bacteriology Disease Report for the Fourth 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 October - December 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 10% for the year when compared to 2006.

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

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
CEMO (HBLB)	1410	0	11
CEMO (VLA)	1230	0	1
Strangles*	2126	134	9
Strangles PCR	1511	109	1
Salmonellosis	221	11	10
MRSA	41	1	3
Clostridium perfringens	43	4	2
Clostridium difficile (toxin by ELISA)	65	2	5
Cryptosporidium	2	1	1

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

Of the samples testing positive for *Salmonella* spp., the serotype of 10 are known after further testing by the VLA. Of the 10 typed strains there were four *Salmonella* typhimurium, two *S. Newport*, two *S. enteritidis* and one each of *S. agona* and *S. anatum*.

LEPTOSPIROSIS UPDATE

Two cases of *Leptospira* associated abortion were identified in the 4th quarter 2007. These are among the first cases of *Leptospirosis* associated abortion identified in mainland Great Britain. The cases were identified on separate premises. Diagnosis was made using immunohistochemistry. Immunohistochemistry is a sensitive and specific method of identifying *Leptospira* organisms in placental and foetal tissues. Serotyping is not possible based on immunohistochemistry alone and in the two cases identified in 2007 the serotype is unknown.



Leptospirosis is zoonotic disease caused by spirochete organisms. Equine disease associated with Leptospirosis includes uveitis, abortion and haemolytic anaemia. Equine abortion associated with Leptospirosis has been seen in several countries, including the USA and Ireland. The leptospirosis serovar most commonly associated with abortion in the USA is *L. kennewicki* while in Ireland *L. bratislava* is most commonly identified.

Mares become infected with Leptospirosis through direct or indirect contact with spirochetes shed in the urine of infected hosts. Many horses are sub-clinically affected with Leptospirosis and show no clinical signs. Leptospirosis serovars are adapted to survive in certain hosts and are maintained within these populations with the spirochetes being shed in urine. For example, *L. kennewicki* is maintained by skunks and it is thought that horses are the reservoir host for *L. bratislava*. Mares show no impending signs prior to abortion and abort late in gestation (6 months to full term). Occasionally foals will survive to term and infected foals have been reported to survive the neonatal period with intensive therapy.



Equine Infectious disease control at public auctions
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Public auctions represent a unique opportunity for the spread of equine infectious diseases and present challenges for the management of disease outbreaks. In a short period of time a large number of horses gather together in one location, mix to a greater or lesser extent and are then dispersed. Often the horses originate from the UK, the Republic of Ireland, mainland Europe, USA and further afield. In addition, buyers from these and other countries, such as Japan, South Africa, India, Australia and the Middle East take horses home shortly after the sales. The possibilities for the spread of infectious disease are manifold. While it is unlikely that vendors will send clinically ill animals to sales, animals may be incubating a variety of diseases when they arrive at the sales ground. This will be exacerbated by a prolonged or a stressful journey, for example when shipment from overseas is delayed due to weather conditions. After the sale those horses consigned to countries such as Japan, Australia, New Zealand and Barbados are quarantined before shipment and others are quarantined on arrival at their destination (USA, South Africa). In this way certain infectious diseases will have time to incubate and develop within the quarantine facilities and therefore be prevented from spreading further. Animals which leave within a few hours of the sale for various parts of the UK and Ireland are the most likely to initiate epidemics as they often move directly into new yards. The commonest causes for alarm at the sales complex are abortion and neurological signs due to EHV (see earlier article for information on EHV).

With the majority of infectious diseases the danger period is after the animals have left the sales premises and has arrived at its new home. It is extremely important that animals from the sales are placed in quarantine for a period of 10 – 14 days before allowing them to mix with other animals. This gives time for the majority of infectious diseases to develop and will prevent onward spread of disease. For the small number of infectious diseases which develop at the sales complex, prompt treatment, rigorous isolation and careful attention to hygiene are required whilst the results of diagnostic techniques are awaited.

Some of the more commonly recognised infectious diseases that occur at sales are described below, along with information as to how best to manage the outbreak and confirm the diagnosis.

Abortion

Abortion can be caused by a number of infectious and non-infectious causes. Infectious causes include bacteria, viruses (EHV-1 and EVA) and fungi. Non-infectious causes include placental defects, umbilical cord defects, twinning, maternal stress and chromosomal defects. Recent figures show that most abortions are of a non-infectious cause (Smith et al 2003). Of the infectious causes, EHV-1 abortion is the most serious as this can cause abortion in individual animals or in storms.

Following an abortion in a public sales complex, the abortion should be treated as potentially infectious until proven otherwise. The aborted mare should be left in her stable and only one attendant should deal with her. A *post mortem* examination of



the foetus should be arranged urgently. In a sales situation, rapid confirmation of EHV as the cause of abortion is very important. The results from the gross *post mortem* examination and Polymerase Chain Reaction (PCR) testing of placenta and foetal tissue can be achieved within a few hours and the use of these tests have proved very reliable in clinical situations. Characteristic changes seen on gross post mortem examination include pleural and peritoneal effusion, oedema of the lungs, necrotic foci in the liver and necrosis of the thyroid gland. PCR testing is a highly specific and extremely sensitive test for EHV-1 and results can be achieved rapidly. Further testing for EHV that should be performed includes histopathology (characteristic changes include eosinophilic inclusion bodies in hepatic cells) and immunofluorescence (this is a useful and rapid screening test that can be carried out on frozen sections from aborted foetal tissue. The test is highly specific, but false negatives do occur). In addition, virus isolation and serology should be performed. Virus isolation is the “gold standard” for laboratory diagnosis of EHV infections; however the test takes 5-7 days which makes it less useful for rapid diagnosis of EHV than some of the previously mentioned tests. Serology can be used to get a retrospective diagnosis of EHV infection; however the use of serology is not a reliable way to diagnose EHV abortion.

The mare should remain isolated until results of the preliminary tests are available. If these suggest it is likely to be an EHV-1 abortion, her quarters and limbs should be cleaned and washed with disinfectant and she should be removed from the sales complex to an isolation facility. The stable should be left untouched until a break occurs in the sale when thorough disinfection can be carried out. Animals stabled in the same row of boxes (particularly if roof space is shared or they have had the same attendants as the aborted mare) should be withdrawn from the sale and removed to isolation facilities separate from the infected case. They should be subdivided according to risk (i.e. proximity to the case, shared grooms etc.) and if pregnant, length of gestation. Testing of ‘in-contact’ animals can be carried out to determine if exposure to virus has occurred. Other sales lots which are separated from the aborting mare by reasonable physical barriers or distance can still be sold and dispersed but with warnings to isolate them afterwards. This emphasises the need for sale complexes to be designed as multiple blocks of stables to facilitate separation of groups of animals at different levels of risk.

The infected mare can be released after one month’s isolation and can then join other barren mares (as could any non pregnant contact mares or fillies, as described in the HBLB Code of Practice). The earliest a second abortion is expected after a primary infectious case would be 10 days. A bacterial or fungal abortion would require no special measures beyond removal of the mare to isolation facilities and cleaning and disinfecting her stable.

Strangles

A case of Strangles can be suspected on clinical grounds and confirmed by culture or PCR of abscesses or nasal discharge. If a positive case is suspected or identified, the animal should be immediately isolated from other horses. The stable the horse had inhabited must be cleaned and disinfected thoroughly paying particular attention to feed and water mangers. Recent experience has shown that a number of animals can be asymptomatic shedders (carriers) which present particular problems in detection. Horses



that have been in contact with a Strangles case should be treated as potential carriers of *Streptococcus equi*. To determine if such animals are carriers, 3 nasopharyngeal swabs should be taken (over a period of 2 weeks) and tested by culture and/or PCR. If 3 negative results are obtained, it is highly unlikely that the horse is carrying *S.equi*. Not all carrier animals will show clinical signs of disease and a non-symptomatic carrier can easily leave the sales complex and initiate a Strangles outbreak if appropriate quarantine and testing is not undertaken. The greatest risk of development of Strangles is not at the sales complex but when the animal returns to a stud or stable following the sale. This reinforces the need for a period of quarantine before a new animal is mixed with other animals on the stud. A period of 14 days is generally sufficient for clinical signs to develop.

References

- Carson, D.M., McGladdery, A.J., Whitwell, K.E., and Blunden, A.S. (1989). Acute neurological crisis in a foal resident at a public sales complex. *Equine Vet. Educ.* 1 (2) 89 – 93.
- Ellis, D. (1989). Some thoughts on infectious disease control in a sales complex. *Equine Vet. Educ.* 1 (2) 106 – 107
- Greenwood, R.E.S., and Simson, A.R.B. (1980). Clinical report of a paralytic syndrome affecting stallions, mares and foals on a Thoroughbred stud from *Equine Vet. J.* 12 113 – 117.
- Slater, J. (2007). Equine Herpes viruses, in *Equine Infectious Diseases*, eds. Sellon, D.C. and Long, M.T. pp 134 – 153 Saunders Elsevier.
- Smith, K.C., Blunden, A.S., Whitwell, K.E., Dunn, K.A. and Wales, A.D. (2003) A survey of equine abortion, stillbirth and neonatal death in the UK from 1988 to 1997. *Equine Vet J.* 35, 496-501



Toxic and Parasitic Disease Report for the Fourth 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 fourth quarter 2007

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
Grass Sickness	17	5	5
Hepatic toxicoses	6	4	2
Atypical myopathy	4	4	3
Botulism*	1	1	1

*This case involved a 25 year old Shetland pony. Diagnosis of botulism was made on the basis of clinical signs and history only.

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

	Number of Samples Tested	Number Positive	Number of Contributing Laboratories
<u>Endoparasites</u>			
Ascarids	1246	29	12
Cyathostomes	1246	214	12
Dictyocaulus	263	7	5
Strongyles	1280	96	12
Tapeworms	419	6	4
Trichostrongylus	1217	6	12
Strongyloides	1277	13	12
<u>Ectoparasites</u>			
Mites	266	13	8
Ringworm	282	74	6
Dermatophilus	21	0	2

An interesting presentation of *Strongyloides westeri* was identified in a yard in the south of England. Faecal egg counts were performed on a group of 20 weanlings aged 6-8 months. A couple of foals in the group were doing poorly but no other abnormal clinical signs were seen. The only abnormality on faecal egg count was a very high *Strongyloides westeri* count. In total, nine foals out of 20 had high *S.westeri* counts. All foals had been wormed monthly with ivermectin from one month of age. In addition, they had all been wormed with double dose pyrantel a month prior to egg counts being performed. The foals with high egg counts were wormed with double dose fenbendazole for 5 days. All faecal counts were negative following this treatment and all foals showed improvement in growth.



No specific resistance testing was carried out however this may be an example of resistance developing to ivermectin.

A case of *Sarcoptes scabiei* was diagnosed in a donkey this quarter. Only one animal was affected (although there were other equids in close contact). The donkey had crusting over the back and withers. Examination of the crust via microscopy revealed a large number of dead *S. scabiei* mites and a deeper scrape revealed live mites at all stages of development. *S. scabiei* is a relatively rare condition in equids. On this occasion it may have been associated with the presence of foxes in the barn where hay and straw were stored.



Report on *Post Mortem* Examinations for Fourth Quarter 2007

East Anglia

One hundred post mortems were carried out; eighty-two abortions were examined.

Eighty-two post mortems were carried out on aborted fetuses. Compromise of the umbilical cord was identified as the cause of abortion in 32 cases. Equine herpes virus (EHV) was identified in 4 cases. All 4 cases were in thoroughbred mares and 2 of the mares were vaccinated against EHV. In each case PCR testing of foetus and placenta was negative for EHV-1 and -4 but EHV was identified via immunohistochemistry (IHC) testing of placental tissue. IHC of foetal tissue was negative in all cases. Other causes of abortion were placentitis (3), placental mineralisation (4), placental separation (1), placental insufficiency (2), ischemic infarction of the placenta (1) and unspecified congenital defects (1). Foetal hepatopathy was identified in 1 case; the cause of hepatopathy was not identified. Leptospirosis associated abortion was identified in 2 cases (see page 10 for further details). The cause of abortion was not identified in 31 cases.

Two cases of septicaemia were examined. One case involved a one month old donkey foal with evidence of interstitial pneumonia and septicaemia. The second case was a nine month old foal with septicaemia and multiple-organ dissemination. No bacterial growth was obtained.

Four cases presented due to signs of neurological disease. Two horses presented with evidence of central neurological disease. Findings in the first case included a cholesterol granuloma distending the lateral ventricles (7 year old Thoroughbred). The second case had evidence of severe hepatocyte necrosis considered to be severe enough to cause hepatic encephalopathy. Blood ammonia concentration was not measured in this horse to confirm the presumptive diagnosis of hepatic encephalopathy. The cause of hepatic damage was not determined. Two further neurological cases were examined. Findings included cervical vertebral instability at C4-C5 with bilateral haemorrhage in the spinal cord at the level of the cranial thoracic vertebrae (1) and unspecified spinal cord trauma (1).

Two gastrointestinal cases were examined. One case presented within 24 hours of surgery for correction of large colon volvulus. Findings in this horse included necrosis of the colonic mucosa and vasculitis and thrombi formation in the colon vasculature. There was further systemic evidence of disseminated intravascular coagulopathy (DIC). The second case died suddenly. *Post mortem* findings included gastric rupture and adhesion of the jejunum to the cecum and small colon with evidence of thickening of the mesenteric root. This horse was known to be a *Streptococcus equi* carrier and it suspected that the adhesions were a sequelae to bastard Strangles.

Two orthopaedic cases were examined. Findings included pelvic fracture with subsequent haemorrhage into the abdomen (1) and multifocal osteonecrosis of the proximal femur (1). Two cases of atypical myopathy were also examined. The horses were not from the same premises. One case of degenerative myopathy of unknown cause was examined.

One respiratory case was examined. The horse has clinical evidence of severe recurrent airway obstruction (RAO) unresponsive to treatment. *Post mortem* findings confirmed the diagnosis of RAO. A six month old foal with evidence of congestive heart failure was



examined. *Post mortem* findings included pulmonic valve endocarditis, dilatation of the right ventricle and right atrium and attenuation of the chordae tendinae of the tricuspid valve. No bacteria were recovered from the endocarditis lesion. One case with renal disease was examined. Findings were consistent with immune mediated damage to the glomeruli leading to renal failure.

The cause of death was not identified in 2 cases.

Home Counties

Twenty two post-mortems were carried out; 2 abortions and 1 neonate were examined.

Two abortions were examined. The aetiology of abortion was not determined in either case. An 8 week premature foal was presented. *Post mortem* findings included dysmaturity, atelectasis of the lungs and carpal contracture.

Ten gastrointestinal cases were examined. One grass sickness case was identified. Three cases had small intestinal lesions. Findings included strangulation of the small intestine by a lipoma (1), small intestinal volvulus (1) and muscular hypertrophy of the ileum with secondary perforation and peritonitis (1). Two horses presented with gastric rupture; rupture was secondary to gastric impaction in one case. Cecal impaction and rupture was identified in two cases. The remaining cases had evidence of a rectal tear (1) and peritoneal effusion secondary to vasculitis (1).

Six horses presented due to sudden death. Two cases were identified as having cardiac abnormalities. One had evidence of hypertrophic cardiomyopathy and secondary heart failure and the second had acute myocarditis of undetermined origin. Atypical myopathy was identified as the cause of death in one case and botulism was the suspected cause of death in another (please refer to Table 3 for further details). Findings in the remaining cases included intra-abdominal haemorrhage from a phaeochromocytoma and septicaemia associated with enteric parasitism.

Two neurological cases were examined. An 18 month old Arab filly presenting with acute onset ataxia was found to have a traumatic compression fracture of C7 and T1. A 26 year old gelding with ataxia and dysuria was found to have trauma of the cauda equina and sacral nerves. One orthopaedic case was presented. Septic arthritis was identified on examination.

South West

Eighteen post-mortems were carried out; no abortions/neonates were examined.

Four orthopaedic cases were examined. Three cases had evidence of laminitis and one case had penetration of a synovial structure. Six horses were presented due to gastrointestinal disease. Findings included compromise of an unspecified area of the gastrointestinal tract (2), large colon volvulus (1), large colon volvulus with cecal volvulus (1), cecal necrosis and peritonitis (1) and cecal rupture secondary to impaction (1).

Neoplasia was identified during three *post mortem* exams. Findings included alimentary lymphosarcoma (1), multicentric lymphosarcoma (1) and haemangiosarcoma involving the spleen (1). Findings in the remaining cases included traumatic fracture of the skull (2), guttural pouch mycosis (1), necrotising bronchopneumonia (1) and chronic hepatitis and septicaemia (1).



Scotland

Sixteen post mortems were carried out; one aborted foetus was examined.

One aborted foetus was examined. Findings included acute bronchopneumonia with aspirated squames. *Staphylococcus* was isolated from this foetus.

Nine gastrointestinal cases were examined. Two cases of acute grass sickness were identified. Findings in other cases included colon rupture (1), colon torsion (1), exsanguination following epiploic-foramen entrapment (1), eosinophilic enteritis (2), gastric rupture in a 4 month old foal secondary to suspected delayed gastric emptying (1) and jejunal necrosis associated with a strangulating lipoma (1). One of the cases of eosinophilic enteritis also had evidence of oesophageal stricture.

Four horses were presented due to orthopaedic disease. Findings included chronic laminitis (2) and periarticular cellulitis (1). The final orthopaedic case had evidence of multiple limb fractures.

Other cases included hepatic lipidosis (1) and renal papillary carcinoma (1).

Northern Ireland

Twelve post mortems were carried out; three abortions were examined.

Three fetuses were examined; all were from separate premises. Leptospirosis antigens were identified in the kidney and adrenal of one of the cases (for further details on *Leptospira* associated abortions please see page 10). *Streptococcus zooepidemicus* was also isolated from this foal. *Actinobacillus suis* was isolated from the second case and no significant findings were identified in the third case.

Three gastrointestinal cases were presented for examination. Findings included cyathostomiasis (1), eosinophilic granulomas in the small intestine (1) and colitis associated with a high faecal *Strongyloides* count (1).

One horse presented with a history of pneumonia. *Post mortem* examination revealed severe consolidation of the left lung lobes and purulent thoracic fluid. *Streptococcus zooepidemicus* was isolated from the lung, liver and spleen. One case with Strangles was also examined.

Two cases of steatitis were identified during *post mortem* examination. One case involved a 4 week old donkey foal. This foal had evidence of low levels of selenium and vitamin E. This was one of three foals to die with similar clinical signs on the same premises. Selenium and vitamin E levels were also found to be low in 4 adults from the same premises. The second case involved a 7 month old pony foal. Steatitis is a condition of inflammation of the adipose tissue and is most commonly seen in foals. Extensive subcutaneous plaques develop along the dorsal and lateral aspects of the body. The plaques are painful on palpation. Histological evaluation of the affected tissue reveals fat necrosis with secondary pyogranulomatous inflammation, dystrophic mineralisation, deposition of ceroid pigment and fibrosis. The condition generally results in death or euthanasia. The condition is associated with systemic vitamin E and selenium deficiency.

One horse presented with Clostridial myonecrosis secondary to a penetrating wound of the upper lip. *Clostridium novyi* was identified by fluorescence. A mare with a chronic history of foot abscessation was also examined. *Post mortem* examination revealed



bacterial myocarditis and fibrinous pericarditis with hydrothorax and spread of the hoof infection into the coronet area and suspensory ligament. *Streptococcus zooepidemicus* was cultured from the leg, liver and spleen. Bacterial myocarditis may have been sequelae to the chronic hoof abcessation.



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

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