DEFRA / AHT / BEVA

EQUINE QUARTERLY DISEASE SURVEILLANCE REPORT

Volume 1, No. 3: July-September 2005

Highlights in this issue:

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 third quarterly equine disease surveillance report 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.

Since the last report there have been a number of developments relevant to equine health and welfare. In August DEFRA launched a consultation into a national strategy for dealing with Specified Type Equine Exotic Diseases (STEED). These diseases comprise important vector borne encephalitides such as West Nile virus, which has been the cause of significant mortality in the USA since it first occurred in New York State in 1999. The deadline for receipt of responses to the consultation passed recently on 21st November 2005, although the document remains available on-line at http://www.defra.gov.uk/corporate/consult/current.htm. This consultation represented an opportunity for specialist laboratories and interested parties, such as AHT and BEVA, to illustrate the key role that they could play in planning and conducting surveillance and control of these important infections.

Another consultation that has recently finished relates to the BEVA-led Health and Welfare Strategy for the Horse, Pony and Donkey, supported by DEFRA. Although the consultation ended on 30th of November 2005, interested readers can still view the document at http://www.defra.gov.uk/animalh/ahws/ehws/index.htm.

In September the Horserace Betting Levy Board (HBLB) launched the 2006 version of their Codes of Practice relating to venereal and other infectious diseases, particularly relating to breeding horses. To coincide with this important date in the equine calendar, we have commissioned two focus articles relating generally to the history of the Codes and more specifically to recent changes to recommendations on swabbing requirements for contagious equine metritis (CEM).

In the bacteriology section of this report data relating to antibiotic resistance have not been included. We hope to introduce these sorts of data again in the future on a less frequent basis in order to allow us to try and maximise their clinical relevance to veterinary colleagues. This will entail continued good co-operation from our reporting laboratories in order to optimise the quality and scope of the information being presented.

A future intention of these reports is to present a wider range of syndromic surveillance data relating to non-infectious conditions which are of direct relevance to equine general practitioners. In time these might include reports on laminitis and other forms of lameness, allergic lung disease, surgical and medical colics, infertility, non-infectious abortion and neurological disease. As an example of this type of syndromic reporting, Professor Chris Proudman has kindly provided a summary of data arising from colic cases referred to Liverpool University Large Animal Hospital. As these data are not based on detection of specific aetiological agents but on expert clinical judgment (based on experience) some caution is required in their interpretation.

Professor Chris Proudman is an internationally recognized expert in equine gastroenterology, based at the University of Liverpool. Chris' article introduces data relating to colic referrals made to the equine hospital at Leahurst. This initial article provides information for the twelve month period between October 2004 to September 2005 and we intend that this will become a regular feature of future surveillance reports.

In response to positive feedback we continue to provide topical focus articles in which recognised contributors provide detailed insights into novel aspects related to topics covered in the surveillance report. 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. Focus articles in this issue have been contributed by Marion Eaves, Dr Nick Davis-Poynter and Dr James Wood.

Marion Eaves is the Senior Grants Officer at the HBLB who also acts as the Secretariat to the Codes of Practice Sub-Committee. Marion's article provides a historical overview of the development of these Codes, which continue to underpin the prevention and control of important infectious diseases affecting the breeding horse.

Dr Nick Davis-Poynter is Head of Infectious Diseases at the Animal Health Trust. His article provides an overview of recent developments in EHV-1 research concentrating on methods for subtyping viral isolates and identifying isolates with the potential to cause neurological disease.

Dr James Wood is Director of the Cambridge Infectious Diseases Consortium (CIDC), a DEFRA-HEFCE funded programme under the Veterinary Training and Research Initiative (VTRI) based at the Cambridge University Veterinary School. James' article summarises how quantitative risk assessment methods enabled scientifically based changes to be made to the HBLB Codes of Practice relating to CEM.

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.

Focus article: historical background of the HBLB Codes of Practice
Courtesy of Marion Eaves, Horserace Betting Levy Board

Contagious Equine Metritis (CEM) was first seen in the UK in 1977 when large numbers of Thoroughbred mares showed profuse vulval discharge following mating. Many studs were forced to stop covering.

The Levy Board, through its Veterinary Advisory Committee (VAC), initiated investigations into this new condition. Samples from affected mares were examined in veterinary laboratories, but, although there was copious bacterial growth from the samples, no causative pathogen was identified. Several samples were also sent to Dr Ernie Taylor, a venereal disease specialist in Cambridge, who, on culturing the samples, noticed small white colonies of organisms amongst the contaminants. He cultured these organisms and, when pure samples were placed in the uterus of unaffected ponies, the disease was reproduced. The bacterium was named *Haemophilus equigenitalis.*

The first Code of Practice to control CEM, published for the 1978 breeding season, arose from this outbreak, with great success. Despite the severity of the requirements, which included swabbing mares three times at weekly intervals prior to covering, high compliance was achieved, and only seven cases were seen that year, with none in the following season.

Over subsequent years, the incidence of CEM was sporadic and the initial disease control requirements evolved, with distinctions made for swabbing of high and low risk mares. During this time, bacteriologists examining the organism decided that it was not Haemophilus, but one that couldn't be classified into any known genus. It was therefore re-named *Taylorella equigenitalis*, immortalising Ernie Taylor, who originally identified it.

Such was the impact of the CEM Code, which also included disease caused by *Klebsiella pneumoniae* and *Pseudomonas aeruginosa,* that coverage of disease control was subsequently extended to include Codes on EHV and EVA. An expert Sub-Committee was formed, which meets each year to review and update the recommendations as needed, in light of new scientific knowledge, or practical experience, such as outbreaks. The last major review of the Codes took place in 2003 to take account of experiences in dealing with the 2002/03 outbreak of CEM in non-Thoroughbreds and to update the format of the Codes, to the current colour version.

A case of EVA in December 2004 and of CEM in Spring 2005 in non-Thoroughbreds in the UK serve as a timely reminder of the importance of preventing venereal diseases by implementing the Codes of Practice. Prompt action by everyone concerned in these cases meant that they were well contained and there was no threat to horse breeding in the UK. The success of the Codes in controlling these incidents underlines the continued importance of breeders rigorously implementing the recommendations in the Codes to ensure freedom from infection in horse breeding in the UK.

Each year the Codes are widely distributed to Thoroughbred and non-Thoroughbred breeders and veterinary surgeons. They can also be downloaded in PDF format from the HBLB's website, www.hblb.org.uk, or are freely available from the Board, the TBA and the British Horse Society.

Virology Disease Report for the Third Quarter of 2005

We are pleased to include data relating to EVA serology from the Veterinary Laboratories Agency (VLA), Weybridge, 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. Of the 35 positives detected by the VLA, 19 (54%) were among export samples, 5 (14%) imports, 3 (9%) for AI purposes and the remainder (23%) for private diagnostic purposes.

Table 1: Diagnostic virology sample throughput and positive results for third quarter 2005

	Number of Samples Tested	Number Positive	% Positive	Number of Contributing Laboratories
Serological Tests				
EVA VN/ELISA	466	11	2.4#	2
VLA EVA VN	925	35	3.8#	1
EHV-1/-4 CF test	264	50	18.9*	1
EHV-3 VN test	11	4	36.3	1
ERV-1/-2 CF test	136	20	14.7*	1
Influenza HI test	138	20	14.4*	1
Virus Detection				
EHV-1/-4 PCR	21	1	4.8	1
EVA PCR	0	0	0	1
Influenza NP ELISA	9	1	11.1	1
Influenza VI in eggs	1	1	100	1
EHV VI	15	0	0	1
VLA EVA VI	7	0	0	1
Rotavirus	17	8	47.0	2

EHV = equine herpes virus, EVA = equine viral arteritis, VN = virus neutralisation, ELISA = enzyme-linked immunosorbent assay, CF = complement fixation, HI = haemagglutination inhibition, PCR = polymerase chain reaction, NP ELISA = nasopharyngeal swab

VI = virus isolation, ERV = equine rhinovirus, # = Seropositives include vaccinated stallions

* = Diagnosed positive on basis of seroconversion between paired sera

Equine Herpes Virus (EHV)

EHV-1 Respiratory Disease

A two-year-old Thoroughbred in training in Lancashire with a history of intermittent pyrexia, respiratory disease and poor performance seroconverted to EHV on paired serum samples collected in July. The other sixty horses on the yard were generally not clinically affected. None were vaccinated against EHV. A small outbreak of mild respiratory disease occurred in August on a private premises in Leicestershire. Of five in-contact animals two were affected and samples received from a ten-year-old Warmblood gelding were positive on EHV complement fixation (CF) antibody testing. A yearling of unknown breed stabled in West Yorkshire showed nasal discharge, cough and lymphadenopathy. Paired sera demonstrated marked seroconversion to EHV-1, -4.

EHV-3 Venereal Disease (Coital Exanthema)

Two outbreaks of coital exanthema have been confirmed this quarter. The first in Cornwall affected a stallion and at least one mare which he had recently covered. Both animals developed characteristic vesicular lesions and were found to have high VN antibody titres.

The second outbreak occurred in County Durham and affected a cob stallion and two in-contact mares. The stallion and one of the mares had no visible lesions, the other mare had only healed lesions when examined. Two animals had high VN antibody titres to EHV-3, one seroconverted between paired samples. Appropriate restrictions on breeding activities were put in place and no further cases reported.

Focus article: pinpointing the molecular basis of EHV-1 pathogenicity
Courtesy of Dr Nick Davis-Poynter, Head of Infectious Diseases, AHT

Few equine practitioners will have forgotten the series of outbreaks of neurological disease cases that occurred in the South East of England in 2003 (Cardwell *et al*., 2003). These outbreaks illustrated the importance of good collaboration between horse owners, veterinary surgeons in the field and their scientific and veterinary colleagues in specialist laboratories.

The EHV-1 research group led by Dr Nick Davis-Poynter at the Animal Health Trust is now revolutionising our understanding of EHV-1 epidemiology and pathogenicity through the development and application of sensitive molecular assays based on detailed knowledge of the viral DNA sequence (Nugent *et al*., 2005). The basis of this research was to compare the full DNA sequences of two well-characterised EHV-1 strains: one, named Ab4, which was associated with abortion and neurological disease and the other, named V592, which was associated with abortion only. This painstaking sequence analysis revealed 150 areas of variation across the viral genome. Dr Davis-Poynter and his group used these areas of variable DNA sequence to design PCR assays that could be applied rapidly to other strains of EHV-1 from field cases of disease, enabling the viruses to be subdivided into six major strain groups. The distribution of these different groups varies between different countries.

Using this technology Dr Davis-Poynter's group have also been able to confirm or refute epidemiological links between successive outbreaks of EHV-1 infection. For example, analysis of the two outbreaks of EHV-1 neurological disease that occurred in Kent in spring 2003 showed that the viruses involved were from different strain groups and that the outbreaks were, surprisingly, unrelated to each other. This technology thereby enables the equine practitioner, in liaison with colleagues expert in molecular virology and epidemiology, to assist in determining whether a breach in quarantine/disinfection procedures has occurred and to investigate potential vaccine breakdowns.

In a second important outcome of the EHV-1 research programme outlined above the Animal Health Trust has also identified, for the first time, a region of variation in the DNA sequence of different EHV-1 strains that correlates directly with their ability to cause neurological disease. This sequence variation occurs in the DNA polymerase gene of the virus, which is involved in initial viral replication within infected cells and may also be involved in establishment of latency and reactivation. This breakthrough is of profound importance. When used in a rapid PCR assay it will enable the neurovirulent potential of an EHV-1 strain (e.g. from a case of respiratory disease or abortion) to be determined within two days. **In some disease outbreaks this information may therefore be available before the first case of neurological disease has occurred.** This will enable isolation and movement restrictions to be instituted much more quickly than would otherwise be the case. It will also be possible to use this method to establish when the circulation of neurovirulent isolates on an equine premises has ceased, thereby enabling normal activities to be resumed.

Equine Rhinovirus

A six-year-old, heavy hunter gelding kept with seven others on a small holding in Gloucestershire was found to have a very high titre for equine rhinovirus-2, which was considered to be significant in conjunction with the clinical signs of upper respiratory disease exhibited by the horse, which included nasal discharge and cough. There was no other evidence of viral infection although a paired sample was not submitted. Virus isolation on a heparinised blood sample was negative. Four animals were affected in total.

Equine Influenza

A single outbreak of influenza was confirmed this quarter on a livery yard in Wales. None of the fourteen horses on the premises was vaccinated and eight were clinically affected. Clinical signs were pyrexia, cough, depression and a mucopurulent nasal discharge. Nasopharyngeal swabs were submitted from two affected animals towards the end of the outbreak and one, from an eight-year-old stallion that had been most chronically affected, was positive for influenza by ELISA. The virus was isolated and found to be Newmarket/5/03-like in its reactivity with the panel of ferret antisera. On sequencing of the HA1, it was very similar to the viruses isolated in Wales in 2004. The Wales/04 viruses had a distinct motif in the signal sequence (a repeat of 'IF') - the 2005 isolate also has this motif, suggesting that it was descended from the 2004 viruses. It also has two additional changes (G7D and V237E) neither of which is in an antigenically significant site and do not appear to affect the reactivity of the virus in HI assays with ferret antisera.
In conclusion, Newmarket/2003-like viruses continue to circulate.

Bacteriology Disease Report for the Third Quarter of 2005

A summary of the diagnostic bacteriology testing undertaken by different contributing laboratories is presented in Table 2. For contagious equine metritis (CEM) 8 of 28 HBLB approved laboratories contributed data. The reference laboratory at the VLA also provided data and these are shown separately in Table 2. None of the contributing laboratories isolated the organism and no infection was confirmed during the quarter. Among 7 laboratories testing for *S. equi*, the causative agent of strangles, there was a 9% isolation rate from 2088 samples tested. No isolations of methicillin resistant *Staphylococcus aureus* (MRSA) from equine samples have been made by any of the participating laboratories during this quarter.

Table 2: Diagnostic bacteriology sample throughput and positive results for third quarter 2005

	Number of Samples Tested	Number Positive	% Positive	Number of Contributing Laboratories
non-VLA CEMO	6748	0	0	8
VLA CEMO	*1581*	*0*	*0*	*1*
Strangles (*S. equi*)	2088	183	9	7
Salmonellosis	124	12	10	5
MRSA	12	0	0	2

CEMO = contagious equine metritis organism (*Taylorella equigenitalis*)
MRSA = methicillin resistant *Staphylococcus aureus*

Focus article: Changes to routine CEM swabbing requirements based on quantitative risk assessment

Courtesy of Dr. James Wood, Director, Cambridge Infectious Diseases Consortium.

Prior to 2003, the HBLB Codes of Practice contained recommendations for the control and prevention of infection with *Taylorella equigenitalis* (contagious equine metritis organism or CEMO) based on swab cultures. Among the recommendations were that swabs collected from the clitoris, including fossa and sinuses and endometrial swabs, collected via the cervix, collected during oestrus both prior to covering or prior to repeat coverings should be cultured both aerobically and microaerophilically for the presence of CEMO and other venereal pathogens. Aerobic culture is undertaken to detect *Pseudomonas aeruginosa* and certain capsule types of *Klebsiella pneumoniae*. *T. equigenitalis* can usually only be cultured in microaerophilic conditions.

It had been suggested by some veterinary surgeons that the costs of complying with the recommendation for prolonged microaerophilic culture of swabs in mares considered at low risk for CEMO were effectively reducing compliance with the Codes as a whole and that benefits in disease surveillance were consequently being lost. Therefore, a quantitative risk assessment was undertaken to estimate the likely impact of removing recommendations from the Code to microaerophilically culture endometrial or cervical swabs for presence of CEMO (Wood *et al* 2005).

Importantly, neither the situation for 'high-risk' mares, nor recommendations that related to investigation of irregular or early return to oestrus of mares following covering were considered in the risk assessment. By definition, removal of any particular sample from the recommendations could only increase the risk of infections being missed if the same number of animals was sampled in the same manner. However, if compliance increased and more animals were screened, or revised recommendations were more closely followed as a result, then the overall effects at the population level might result in an increased detection of infected animals and hence a reduced risk of transmission.

The scientific literature was reviewed for evidence on the anatomical distribution of CEMO at different times after infection. In chronically infected mares, CEMO was detectable in clitoral swabs of nearly 93% of mares, but in the cervical swabs of only 31%. In contrast, in acutely infected mares, the organism was detectable in the clitoral swabs of nearly 69%, but in cervical swabs of 84% of animals. The results of the subsequent quantitative risk assessment were sensitive to the prevalence of the infection in the population. However, where prevalence was low (i.e. $\leq$2 infected mares entering the breeding programme per year), there appeared to be few benefits of continuing to culture cervical swabs routinely. Such swabs remain vital when the disease is suspected or when there is a higher overall prevalence of the infection (i.e. $\geq$10 infected mares entering the breeding programme per year).

As a result of this work, the 2003 Code was altered to drop the recommendation to routinely culture endometrial swabs from 'low risk' mares for the presence of CEMO. However, it remains to be seen whether this change in the recommendations will result in

a significantly increased compliance with the Codes overall, as was predicted by some practising stud veterinary surgeons.

Toxic and Parasitic Disease Report for the Third Quarter of 2005

A summary of the diagnostic toxicosis and parasitology testing undertaken by a small number of the contributing laboratories is presented in Tables 3 and 4, respectively.

The data presented for diagnostic toxicosis testing are based on information from a combination of *post mortem* examinations and allied laboratory tests, including histopathology.

Table 3: Diagnostic toxicosis sample throughput and positive results for third quarter 2005

	Number of Samples Tested	Number Positive	% Positive	Number of Contributing Laboratories
Grass Sickness	7	4	57	1
Tetanus	0	0	0	0
Botulism	0	0	0	0
Ragwort	5	4	80	2
Hepatic toxicoses	44	4	9	1

Table 4: Diagnostic parasitology sample throughput and positive results for third quarter 2005

	Number of Samples Tested	Number Positive	% Positive	Number of Contributing Laboratories
Endoparasites				
Strongyles	30	6	20	2
Tapeworms	264	16	6	2
Cyathostomes	759	158	21	3
Dictyocaulus	1	0	0	1
Ascarids	158	19	12	2
Trichostrongyles	0	0	0	
Ectoparasites				
Lice	188	0	0	3
Ringworm	187	55	29	4
Mites	195	5	3	4

The data in Table 4 illustrate the continuing importance of small strongyle (cyathostome) infestations in horses and ponies. We hope to include a focus article on anthelmintic resistance for different endoparasitic diseases in a future issue.

Equine *Post Mortem* Examinations (PME)

Regional reports on gross *post mortem* examinations were received from 3 laboratories.

East Anglia

A total of 18 *post mortem* examinations by the two reporting laboratories (AHT and Beaufort Cottage Laboratories) were performed during the quarter. These comprised 10 abortion investigations, and eight post mortem examinations of foals and adult horses or ponies. The investigations excluding the abortion investigations are summarised below.

Neurological disease

- 11 year-old warmblood gelding which developed narcolepsy and ataxia after general anaesthesia for exploratory laparotomy (surgical diagnosis: sand colic). Detailed PME did not reveal a morphological lesion to account for the clinical neurological signs, which were presumed to represent an acquired functional deficit.
- 6 month-old Thoroughbred foal euthanased electively due to equine wobbler syndrome (14 day history of deteriorating hindlimb ataxia). PME revealed stenosis of spinal canal at the level of the C3-4 articulation.
- 8 year-old New Forest cross pony with acute onset and rapidly progressive central blindness and depression. PME revealed multifocal marked eosinophilic granulomatous meningoencephalitis. The cause is unidentified but an aberrant host hypersensitivity response or other immune-mediated response to unidentified antigen is suspected.

Respiratory disease

- 3 month-old mixed breed foal which died after presenting with clinical signs of severe respiratory disease. PME revealed guttural pouch empyaema and retropharyngeal lymph node abscessation caused by *S. equi* infection (equine strangles). Complicating bronchopneumonia caused by *S. zooepidemicus* infection.

Traumatic disease

- 20 year-old mixed breed gelding presented with progressive weakness and weight loss and euthanased due to acute onset lameness following a kick. PME revealed pituitary adenoma and comminuted pelvic fracture (presumed traumatic).
- 3 year-old Thoroughbred colt euthanased with suspect pelvic fracture. PME confirmed pelvic fracture (bilateral, involving iliac wings), with concurrent sacro-iliac subluxation and intra-abdominal haemorrhage.

Alimentary tract disease

- 15 month-old Welsh mountain pony with acute onset colic. PME revealed acute equine grass sickness.
- 20 year-old mixed breed gelding presented with progressive weakness and weight loss. PME revealed overgrown teeth and general poor bodily condition.

South West

Twelve full PME were performed at Bristol University Veterinary School during the third quarter of 2005.

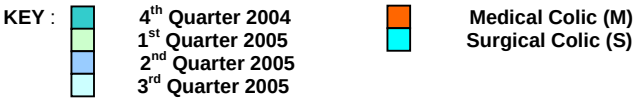
- Two cases of peritonitis of which one was chronic and idiopathic and the other was granulomatous and of probable mycobacterial origin (although not confirmed by culture).
- Two cases of gastric rupture.
- Two cases of intestinal disease, comprising typhlocolitis of unknown cause and ileal hypertrophy with perforation.
- Two cases of traumatic disease comprising one joint and tendon sheath injury and one dislocated third metatarsal with rupture of the collateral ligament.

- One case each of bronchopneumonia (with lymphoplasmacytic pericarditis) disease and renal tumour (suspected nephroblastoma)
- Two cases where no significant findings were made.

Syndromic disease report: Liverpool University Large Animal Hospital Colic Data

Courtesy of Prof. Chris Proudman, Faculty of Veterinary Science, University of Liverpool

These data represent a summary of the outcome of colic cases admitted to the Liverpool University Large Animal Hospital between October 2004 and September 2005.

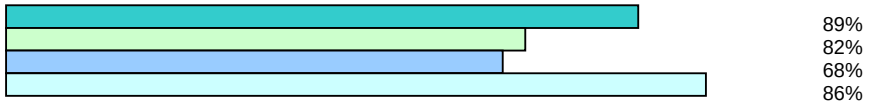


Total Number of Cases Admitted to Hospital

This figure represents cases managed surgically and medically and reflects the broad seasonal variations in admission rates. The high number of admissions in the second quarter of 2005 in part represents the seasonal pattern of grass sickness admissions. At Liverpool most of these cases are classified as 'surgical' as they undergo exploratory laparotomy and ileal biopsy.

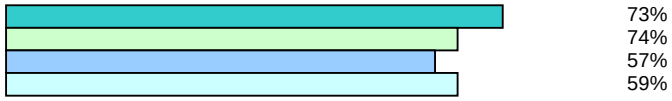
Post-operative Survival

This figure represents the percentage of horses undergoing colic surgery that walk out of the anaesthesia recovery box.

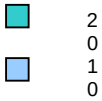


Short-term Survival of Surgical Cases (discharged from hospital)

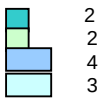
This figure describes the percentage of surgical colic cases that survive to discharge from the hospital. Losses prior to this stage include intra-operative death or euthanasia and post-operative death/euthanasia due to complications (e.g. ileus, endotoxaemia, peritonitis). The low figure reported for the second quarter of 2005 is again due in part to equine grass sickness. Many of these cases would have undergone euthanasia on receipt of a positive biopsy result.



Dead on arrival

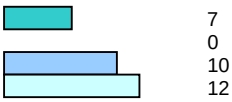


Died/euthanased prior to surgery



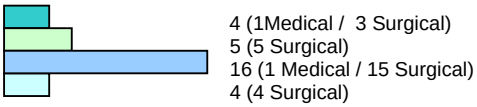
Euthanased on table

Horses in this category are euthanased for a number of different reasons, e.g. untreatable primary lesion, ruptured viscus, overwhelming evidence of equine grass sickness.



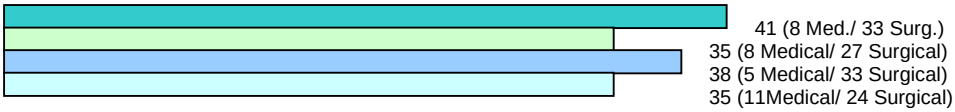
Died/euth. in recovery

Euthanased post-op/Tx



Discharged in <7 days

Discharged in >7 days



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Wood, J.L.N, Kelly, L., Cardwell, J.M. & Park, A.W. (2005) Quantitative assessment of the risks of reducing the routine swabbing requirements for the detection of *Taylorella equigenitalis*. *Veterinary Record* **157**, 41-46.

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

Avonvale Veterinary Practice
Beaufort Cottage Laboratories
BioBest Laboratories Ltd
Central Diagnostic Services, Cambridge
DARDNI
Equine Veterinary Hospital, Arundel
Greenwood, Ellis and Partners
Hampden Veterinary Hospital
J.S.C Equine Laboratory Ltd
NationWide Laboratories
Three Counties Equine Hospital
University of Bristol, Department of Pathology
University of Liverpool, Equine Hospital, Leahurst
Vetlab Services Ltd
Veterinary Laboratories Agency

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

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

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