

## Codes of Practice on

- Contagious equine metritis (CEM)  
*Klebsiella pneumoniae*  
*Pseudomonas aeruginosa*
- Equine viral arteritis (EVA)
- Equine herpesvirus (EHV)
- Guidelines on strangles

These Codes of Practice are published by:

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The Codes and list of Approved Laboratories may be found on our website at [www.hblb.org.uk](http://www.hblb.org.uk). On the home page, select Codes of Practice on Equine Diseases for the Codes and Advancing Veterinary Science and Education then Laboratory Approval Scheme for the list of Approved Laboratories.

This booklet is available from the HBLB, Thoroughbred Breeders' Association and the Welfare Department of the British Horse Society.

These Codes do not imply any liability by the Horserace Betting Levy Board, the Veterinary Advisory Committee nor its Sub-Committees in the implementation of, nor responsibility for enforcement of, the Codes.

#### Note

AI - See checklist on page 26.

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## Introduction

This booklet sets out voluntary recommendations to help breeders, in conjunction with their veterinary surgeons, to prevent and control specific diseases in all breeds of horse and pony. It comprises 3 Codes of Practice:

- Venereally transmitted bacterial diseases caused by the contagious equine metritis organism, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*;
- Equine viral arteritis (EVA);
- Equine herpesvirus (EHV).

It also contains guidelines on *Streptococcus equi* (strangles).

The recommendations within the Codes of Practice are common to France, Germany, Ireland, Italy and the United Kingdom.

Any of the above diseases can have devastating consequences. They compromise horse and pony welfare, disrupt breeding activity, cause economic loss to mare and stallion owners and are costly to deal with.

The diseases are highly contagious. Uncontrolled infection in just one horse or pony can transmit easily to others, potentially escalating to local and national outbreaks. Because EVA and EHV spread via the respiratory route, non-breeding stock can become infected, leading to adverse cost and welfare consequences for owners and horses and, potentially, disruption of equestrian activities locally and nationally. Contagious equine metritis and EVA are notifiable by law and, ultimately, outbreaks on any scale can lead to Britain losing its horse export status.

To avoid these consequences, breeders should aim to prevent disease, and control its spread if a case is suspected or occurs, by implementing the recommendations in these Codes of Practice.

If a case occurs, it is important to inform owners of other horses that are at risk of infection through contact with the affected horse/premises so that they can treat their horse and implement measures to stop any further spread of disease to other horses.

The Codes of Practice set out minimum recommendations for disease prevention and control. Breeders should implement additional precautions whenever appropriate to their circumstances. Mare owners are strongly advised to check whether the stallion stud and/or boarding stud to which their mare is to be sent, or any local breeders' association for that area such as the Newmarket Stud Farmers Association (NSFA), has any requirements additional to those included in these Codes.

Throughout the Codes, the term:

- 'Horse' includes mares and stallions of any breed of horse or pony.
- 'Stallion' includes stallions of any breed to be used for natural mating, teasing or semen collection for AI.
- 'Breeding activity' includes natural mating, teasing and collection and insemination of semen.

The introduction of these Codes of Practice has resulted in a significant decrease in the incidence of infectious disease outbreaks. It is vital that owners/managers of breeding stock maintain vigilance and follow the Codes, in conjunction with the attending veterinary surgeon, at all times.

## Equine infectious anaemia

In 2006, there were cases of Equine Infectious Anaemia (EIA) or 'swamp fever' in horses in Ireland and Italy. These were the first recorded cases in Ireland. There had been sporadic cases in Italy and France in previous years.

The disease – which results in fever, anaemia and death – is caused by a virus that has a worldwide distribution. The virus may be transmitted between horses via infected blood and blood products, blood-sucking insects, contaminated veterinary instruments (eg hypodermic needles), horse equipment and through contamination of the environment. Pregnant mares may infect their own foals through the placenta. EIA can be detected by a blood test known as the Coggins test.

Anyone responsible for mares arriving in or returning to Britain from countries where EIA has occurred recently - including Ireland and Italy - or is endemic should ensure that they are clear from infection by Coggins testing shortly before or immediately after arrival. Stallion managers may additionally require pre-mating EIA testing of other mares. They may require the blood sample for the Coggins test (which can be taken at the same time as the blood sample for EVA testing) to be taken within 28 days of the due mating date. Mare owners should check the stallion stud's requirements well in advance of the mare's date of travel.

Equine blood products (eg plasma and immune sera) should only be used in horses if they are from a known, licensed source.

A Defra Code of Practice, describing the disease and giving advice to owners on the prevention of EIA in horses that have travelled to, or are due to travel to, a country affected by EIA, was published in August 2006. The Code is included as an insert with this booklet and is available on the Defra website, [www.defra.gov.uk](http://www.defra.gov.uk)

## Acknowledgements

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# CODE OF PRACTICE FOR VENERALLY TRANSMITTED BACTERIAL DISEASES

This Code of Practice covers disease caused by three species of bacteria:

- *Taylorella equigenitalis* (the contagious equine metritis organism - CEMO)

Contagious equine metritis (CEM), caused by this organism, occurs widely in the non-Thoroughbred population, and to a limited extent in Thoroughbreds, in mainland Europe.

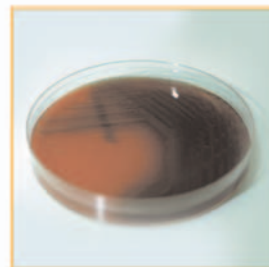
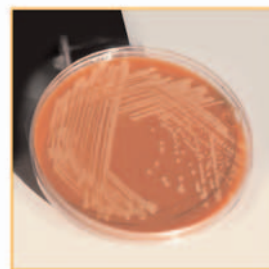
- *Klebsiella pneumoniae* (*K. pneumoniae*)

There are many capsule types of *K. pneumoniae*, most of which do not cause venereal disease. However, types 1, 2 and 5 may be sexually transmitted. Therefore, when *K. pneumoniae* is identified from breeding stock, tests to determine the capsule type(s) present must be undertaken.

- *Pseudomonas aeruginosa* (*P. aeruginosa*)

Not all strains of *P. aeruginosa* cause venereal disease but there is no reliable method to differentiate between the strains. Therefore, all isolates should be considered as potential venereal pathogens.

Both *K. pneumoniae* and *P. aeruginosa* occur sporadically within Europe.



## Notification Procedures

### Contagious equine metritis

In the UK, isolation of the CEMO is **notifiable by law**. This is a statutory requirement under the Infectious Diseases of Horses Order 1987 and any positive samples must be reported by the testing laboratory to a Divisional Veterinary Manager (DVM) of the Department for Environment, Food and Rural Affairs (Defra) who will investigate all cases. DVMs are based in the Animal Health Divisional Offices of Defra. In confirmed cases, Defra asks, initially, that the breeders and veterinary surgeons involved comply with this Code of Practice as a means of controlling the spread of the disease.

If an assessment by Defra concludes that voluntary compliance is not sufficient to control the disease, they may serve Statutory Notices on the affected premises, declaring them an infected place and imposing mandatory requirements, including:

- taking samples or obtaining information to establish the source and extent of disease;



- prohibiting or controlling movement of any horse, carcass or other item;
- prohibiting the breeding activities of any implicated horses;
- disinfection or destruction of infected articles or materials;
- cleansing and disinfection of premises and vehicles.

In the event of statutory powers being invoked, Defra would nominate the laboratories to undertake the testing of all samples required by the subsequent investigation.

Failure to comply with Statutory Notices is an offence under the Animal Health Act 1981 and may lead to prosecution.

It is advisable for owners, or a person authorised to act on their behalf, to inform the relevant breeders' association if CEMO is isolated.

### ***Klebsiella pneumoniae* and *Pseudomonas aeruginosa***

In the UK, isolation of *K. pneumoniae* or *P. aeruginosa* is not notifiable by law. However, if infection occurs in stallions, it is advisable for the owner, or a person authorised to act on their behalf, to inform the relevant breeders' association.

## **Clinical Signs**

### **Mares**

The severity of disease in mares varies. There are two states of infection:

- the active state in which the main outward sign is a vulval discharge which may range from very mild to extremely profuse;
- the carrier state in which there are no outward signs of infection. However, the mare remains capable of transmitting infection because the bacteria are established on the surface of the clitoris, the clitoral fossa and sinuses and, in the case of *K. pneumoniae* and *P. aeruginosa*, sometimes in the urethra and bladder.

### **Stallions**

Remember: 'stallion' means mating stallions, teasers and stallions used for AI

- Infected stallions do not usually show clinical signs of infection but the bacteria are present on their penis, sheath and, in the case of *K. pneumoniae* and *P. aeruginosa*, sometimes in the urethra and bladder. These stallions can infect mares during mating, teasing or AI.
- Occasionally, the bacteria may invade the stallion's sex glands, causing pus and bacteria to contaminate the semen.

## Transmission of Disease

Infection can be transmitted between horses in any of the following ways:

- direct transmission during mating;
- direct transmission during teasing. An infected teaser can transmit disease to mares through contact with his genitalia;
- indirect transmission during teasing. A teaser can transmit infected vulval discharge between mares through genital or naso-genital contact;
- transmission to mares if semen used for AI comes from infected stallions or has been contaminated with the bacteria during semen collection or processing;
- indirect transmission via the hands and equipment of staff or veterinary surgeons who have handled the tail or genitalia of an infected horse.

## Prevention

- The most important means of preventing infection are:
- establishing freedom from infection before commencing breeding activities;
- checking that horses remain free from infection during breeding activities;
- exercising strict hygienic measures during breeding activities.

No vaccines against these bacterial diseases are available.

### Freedom from infection

Establishing freedom from infection before, and checking that horses remain free from infection during, breeding activities involves a veterinary surgeon taking samples ('swabs') from the genitalia of mares and stallions for testing ('culturing') in a laboratory. The laboratory will test for the presence of the CEMO, *K. pneumoniae* and *P. aeruginosa*. If the results are negative, the horse is free from infection and breeding activities may take place. If the results are positive, the horse is infected and must be treated, re-tested and cleared. The horse must not be used for breeding activities at this time. If a swab is positive for the CEMO, the Notification Procedures on page 5 also apply, and an investigation of the source and extent of the disease will be undertaken.

No horse should be used for breeding activities until or unless all swab results are available and negative.



#### Note

AI - See checklist on page 26.

Different types of swab and culture are recommended for different circumstances in this Code of Practice. For further information on the types of swab, taking and submission of swabs, culture and return of results, see 'Diagnosis' on page 12.

Recommendations for establishing freedom from infection in mares and stallions before breeding activities commence, and for checking that horses remain free from infection during breeding activities, are on pages 8–11.



### Hygiene measures

Staff should be made aware of the risk of direct and indirect transmission of infection. They should always wear disposable gloves when handling the tail or genitalia and change gloves between each horse. Separate sterile and, where appropriate, disposable equipment and clean water should always be used for each horse.

### Prevention recommendations

These are minimum recommendations. Mare owners should check whether the stallion stud, boarding stud or local breeders' association (eg NSFA) has any additional requirements.

### Mares

**After 1st January in any year, and before a mare is mated/teased/inseminated,** the following should be undertaken:

- ascertain whether the mare is 'high risk' or 'low risk' (see Appendix 1);
- complete a Mare Certificate (see Appendix 2) and send it to the stallion owner/manager.
- arrange for a veterinary surgeon to take the appropriate swabs (see protocol below and on page 9) and send them to a laboratory for culture;
- distribute the resulting Laboratory Certificates (see Appendix 3) in accordance with the protocol on page 9.

If the results are negative, the mare is free from infection and breeding activities may commence. If they are positive, she is infected and must not be mated, teased or inseminated until she has been treated and cleared under the direction of the attending veterinary surgeon, and, in the case of the CEMO, in accordance with any Defra requirements.

### Swabbing protocol for mares temporarily or permanently resident at stallion stud (pre-breeding)

Mare status	Type of swab	When/where taken	Culture
Low risk	Clitoral	Home premises or stallion stud	Aerobic and microaerophilic
	Endometrial	During oestrus at stallion stud	Aerobic
High risk	Clitoral	Before arrival at stallion stud	Aerobic and microaerophilic
	Clitoral	On arrival at stallion stud	Aerobic and microaerophilic
	Endometrial	During oestrus at stallion stud	Aerobic and microaerophilic

### Swabbing protocol for walking-in mares (pre-breeding)

The following applies to mares which will not be resident on the same premises as the stallion, but will be 'walked in', either from their home premises or from a boarding stud. If 'high risk' walking-in mares are going to a boarding stud, that stud should either be under the control of, or meet full approval of, the stallion owner/manager. The veterinary surgeons involved should liaise closely to ensure adherence to the Code of Practice and to arrange any additional precautions that may be required.

Mare status	Type of swab	When/where taken	Culture
Low risk	Clitoral	Home premises or boarding stud	Aerobic and microaerophilic
	Endometrial	During oestrus at home premises or boarding stud	Aerobic
High risk	2 x clitoral	During two consecutive oestrous periods. The second should be taken at the boarding stud, if used	Aerobic and microaerophilic
	Endometrial	During oestrus at home premises or boarding stud	Aerobic and microaerophilic

### Protocol for distribution of Laboratory Certificates

Laboratory certificates relating to pre-breeding swabs taken from mares at the home premises should be sent in advance to the stallion owner/manager and, where appropriate, to the boarding stud. Certificates relating to pre-breeding swabs taken from mares at boarding studs should be sent in advance to the stallion owner/manager.

Before a mare is mated, the owner/manager is advised to request a Laboratory Certificate confirming the stallion's disease free status in the current breeding season.

Mare owners/managers should not accept semen for AI without obtaining evidence that the donor stallion was free from infection when the semen was collected. In the UK, this evidence would be provided by a Laboratory Certificate confirming the stallion's disease free status in the current breeding season. When importing semen, it should be accompanied by documentary evidence of freedom from infection with all three bacteria.

**If the mare does not conceive on first (or subsequent) matings**, and her return to oestrus is normal, she should be swabbed again before being re-mated to check that she is not infected as a result of the previous mating, according to the protocol on page 10.

The mare may be re-mated on the basis of negative swab results. If the results are positive, she is infected and must not be mated, teased or inseminated until she has been treated and cleared under the direction of the attending veterinary surgeon, and, in the case of the CEMO, in accordance with any Defra requirements.

### Swabbing protocol for mares temporarily or permanently resident at stallion stud (repeat matings)

Mare status	Type of swab	When/where taken	Culture
Low risk	Endometrial	During oestrus at stallion stud	Aerobic
High risk	Endometrial	During oestrus at stallion stud	Aerobic and microaerophilic

### Swabbing protocol for walking-in mares (repeat matings)

The following swab recommendations apply to mares which will not be resident on the same premises as the stallion, but will be 'walked in', either from their home premises or from a boarding stud. If 'high risk' walking-in mares are going to a boarding stud, it should either be under the control of, or meet full approval of, the stallion owner/manager. The veterinary surgeons involved should liaise closely to ensure adherence to the Code of Practice and to arrange any additional precautions that may be required.

Mare status	Type of swab	When/where taken	Culture
Low risk	Endometrial	During oestrus at home premises or boarding stud	Aerobic
High risk	Endometrial	During oestrus at home premises or boarding stud	Aerobic and microaerophilic

### Protocol for distribution of Laboratory Certificates

Laboratory certificates relating to repeat swabs taken from mares at the home premises should be sent in advance to the stallion owner/manager and, where appropriate, to the boarding stud. Certificates relating to repeat swabs taken from mares at boarding studs should be sent in advance to the stallion owner/manager.

**If any mare returns to oestrus at an unusual (especially shorter than normal) time**, this may be because she is infected. Repeat clitoral and endometrial swabs should be taken and cultured under aerobic and microaerophilic conditions.

**If any mare changes premises, or stallions, between matings**, repeat clitoral and endometrial swabs should be taken at least seven days after mating by the original stallion and cultured under aerobic and microaerophilic conditions.

**These are minimum recommendations. Mare owners should check whether the stallion stud, boarding stud or local breeders' association (eg NSFA) has any additional requirements.**

## Stallions

**After 1st January in any year and before a stallion is used for mating/teasing/semen collection, the owner/manager should:**

- ascertain whether the stallion is 'high risk' or 'low risk' (see Appendix 1);
- arrange for swabs to be taken by a veterinary surgeon in accordance with the protocol below;
- ensure that a Laboratory Certificate (see Appendix 3) confirming the mare's disease free status in the current breeding season, and a current Mare Certificate (see Appendix 2) are received for each mare to be mated, teased or inseminated at the stallion's premises;
- ensure that a Laboratory Certificate confirming the stallion's disease free status in the current breeding season is made available to mare owners/managers.

### **Protocol for swabbing (pre-breeding)**

Two sets of swabs (see definition on page 12) should be taken from all stallions at an interval of no less than seven days and cultured aerobically and microaerophilically.

If the results of culture of swabs are negative, the stallion is free from infection and breeding activities may commence. If they are positive, he is infected and must not be used for mating, teasing or semen collection until he has been treated and cleared under the direction of the attending veterinary surgeon and, in the case of the CEMO, in accordance with any Defra requirements.

**The following should be carried out during the breeding season to check that the stallion has not become infected:**

'High risk' stallions and any other stallion standing on a stud for the first time warrant additional precautions. The first four mares mated with them should be screened for the CEMO, *K. pneumoniae* (capsule types 1, 2 and 5) and *P. aeruginosa* by taking a clitoral swab two days after mating. If the mare subsequently returns to oestrus, an endometrial swab should be taken at that time. These swabs should always be cultured aerobically and microaerophilically.

In stallions, bacterial growth of the CEMO is generally more easily recoverable after mating. Swabbing of all stallions after their first few matings in any season should therefore be considered in conjunction with the attending veterinary surgeon. In addition, mid-season swabbing should be considered for all stallions and teasers. These swabs may be examined for the presence of the CEMO only.

**Remember: 'stallion' means mating stallions, teasers and stallions used for AI**

## Diagnosis

Laboratory diagnosis is essential to confirm the presence or absence of the CEMO, *K. pneumoniae* and *P. aeruginosa* in swabs taken from mares and stallions.

### Types of swab

#### Mares

There are two types of swab:

**Clitoral swab:** taken at any point during the reproductive cycle to demonstrate whether the clitoral fossa and sinuses are free from infection. In the case of pregnant mares, these swabs may be taken before or after foaling.

**Endometrial swab:** taken during oestrus from the lining of the uterus via the open cervix to demonstrate whether the uterus is free from infection.

Mare swabs taken for disease prevention purposes should be cultured according to the recommendations on pages 8–10.

**Note: These are minimum recommendations. Mare owners should check whether the stallion stud, boarding stud or local breeders' association (eg NSFA) has any additional requirements.**

#### Stallions

Swabs should be taken from three sites; the urethra, urethral fossa and penile sheath, plus pre-ejaculatory fluid when possible. Separate swabs should be used for each site and cultured aerobically and microaerophilically in all circumstances.

### Taking swabs

All swabs should be taken by a veterinary surgeon, who should:

- submerge the swabs in Amies Charcoal Transport Medium (which must be within the expiry date) to protect them from the damaging effects of light, which will readily kill any CEMO, *K. pneumoniae* or *P. aeruginosa* present;
- label them clearly to show the date and time they were taken, the horse's name and the site of swabbing;
- indicate clearly whether aerobic, microaerophilic or both cultures are required;
- submit them to an Approved Laboratory for culture.

A list of laboratories in Britain approved by the Horserace Betting Levy Board for the purposes of testing for the CEMO, *K. pneumoniae* and *P. aeruginosa* is published each December in the Veterinary Record and is available from [www.hblb.org.uk](http://www.hblb.org.uk).



### Submitting swabs to Approved Laboratories

The Approved Laboratories must set up swabs for culture within 48 hours of them being taken from the horse. Veterinary surgeons submitting swabs by routine postal services are, therefore, advised not to take swabs on Fridays, Saturdays or Sundays as they may not arrive in time. If weekend or bank holiday swabbing is unavoidable, the veterinary surgeon should ensure that the laboratory is open and able to commence cultures within the 48 hours. In this event, a suitable courier service should be used to deliver the swabs. If a swab does not arrive in time, the laboratory should reject it and advise the veterinary surgeon to repeat the swabbing.

### Laboratory culture of swabs

Laboratories can culture swabs in two ways: aerobically and microaerophilically (see Glossary, Appendix 9). The results of culture will be returned by the laboratory on an official Laboratory Certificate. When planning the timing of breeding activities, breeders and veterinary surgeons should be aware that the results of microaerophilic cultures will not be available for at least seven days.

### Other laboratory tests for CEMO

The immunofluorescence test (IFT) may be used in addition to culture, although this is only available in France at present. Polymerase chain reaction (PCR) testing of swabs for the CEMO and *P. aeruginosa* may also be used. This method is not currently available for routine screening in the UK and is not recognised for import/export testing in the UK.

## Control of Infection

**If infection with any of the three organisms is suspected in any mare, stallion or teaser** on the basis of clinical signs, all breeding activities must cease immediately. The affected horse(s) should be isolated and swabbed by the attending veterinary surgeon.

**If the CEMO, *K. pneumoniae* (capsule types 1, 2 or 5) or *P. aeruginosa* is subsequently isolated from any mare, stallion or teaser:**

1. Stop mating, teasing and collection and insemination of semen immediately;
2. Seek veterinary advice immediately;
3. Isolate and treat the infected horse(s) as advised by the attending veterinary surgeon. In the case of the CEMO, the laboratory will have notified Defra, who may give directions which must be followed;
4. Arrange swabbing of any at risk horses, as advised by the attending veterinary surgeon or by Defra;

**Note**  
The term 'at risk' relates to any horse which may have become infected as a result of direct or indirect transmission of the disease.



5. Inform all owners of mares booked to the stallion, including any which have already left the premises;
6. Inform people to whom semen from the stallion has been sent;
7. Inform the relevant breeders' association;
8. Arrange for one straw from every ejaculate of stored semen from infected and at risk stallions to be tested by a laboratory. If a straw from any ejaculate is infected, all straws from that ejaculate should be destroyed;
9. Any at risk pregnant mare must be foaled in isolation. The placenta must be incinerated. Foals born to these mares should be swabbed three times, at intervals of not less than seven days, before three months of age. These swabs should all be cultured aerobically and microaerophilically;
  - Filly foals: swab the clitoral fossa
  - Colt foals: swab inside the penile sheath and around the tip of the penis
10. Do not resume any breeding activity until freedom from disease has been confirmed in all infected horses (see below). The approval of the attending veterinary surgeon or, in the case of CEM, of the DVM of Defra, should be obtained before resumption of breeding activity.

**Remember: in any suspected or confirmed disease situation, the implementation of strict hygienic measures is essential.**

In the case of CEMO, if Defra do not believe voluntary compliance is sufficient to control infection, they will impose statutory requirements.

## Treatment

Any necessary treatment will be determined by the attending veterinary surgeon.

## Confirmation of Freedom from Disease

Following infection with any of the three bacteria, breeding activities should only be resumed with approval from the attending veterinary surgeon, and in the case of the CEMO, the DVM of Defra, who must be satisfied that infected and in-contact horses have been investigated, treated as appropriate and subsequently cleared on the basis of negative swabs.

The first post treatment swabs should be taken seven or more days after the treatment has ended. All post treatment swabs should be cultured aerobically and microaerophilically.

## Mares

Three clitoral swabs should be taken at intervals of at least seven days and three endometrial swabs should be taken during the next three oestrous periods. All results must be confirmed as negative before any breeding activities resume. If any result is positive, further investigation should be undertaken in conjunction with the attending veterinary surgeon.

## Stallions

Three sets of penile swabs should be taken at intervals of at least seven days and negative results confirmed. Thereafter, the first three mares mated or inseminated by the stallion should have clitoral swabs taken three times at intervals of at least seven days, starting two days after mating or insemination. If any of these swab results are positive, breeding activities should cease pending further investigation in conjunction with the attending veterinary surgeon.

## Export Certification

Swabs taken for examination for the CEMO from horses in the United Kingdom for the purpose of official export health certification must be sent to the designated laboratories within the Veterinary Laboratories Agency (VLA) of Defra. These are the VLA Regional Laboratory, Bury St Edmunds for samples from England and Wales, and the VLA Regional Laboratory, Lasswade for samples from Scotland. In the case of horses that are to be exported from Northern Ireland, swabs should be sent to the Veterinary Science Division Laboratory, Belfast.



# CODE OF PRACTICE FOR EQUINE VIRAL ARTERITIS

## The Disease

Equine viral arteritis (EVA) is caused by the equine arteritis virus (EAV). The virus occurs worldwide in Thoroughbred and non-Thoroughbred populations.

## Notification Procedures

In the UK, EVA is **notifiable by law** under the Equine Viral Arteritis Order 1995. Under the Order, anyone who owns, manages, inspects or examines a horse must notify the Divisional Veterinary Manager (DVM) of Defra when:

- they suspect the disease in a stallion, either on the basis of clinical signs or following blood or semen testing;
- they suspect disease, either on the basis of clinical signs or following blood testing, in a mare that has been mated or artificially inseminated within the past 14 days.

DVMs are based in the Animal Health Divisional Offices of Defra.

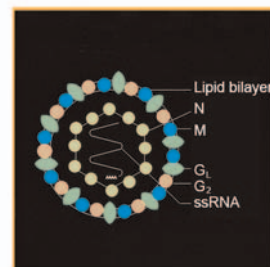
Under the Order, Defra may:

- serve notices prohibiting the use for breeding of the suspect stallion and any semen obtained from it unless permitted under licence by a DVM of Defra;
- take samples or obtain information in order to establish whether disease is present and, if so, the extent to which it has spread.

Upon confirmation of disease, Ministers will publish this fact and the name and location of the stallion concerned, followed by similar publicity when the disease has been eradicated.

When statutory powers under the Order are invoked, Defra will nominate laboratories to undertake the testing of all the samples required for the subsequent investigation.

It is advisable for owners, or persons authorised to act on their behalf, to inform the relevant breeders' association.



## Clinical Signs

The variety and severity of clinical signs of EVA vary widely. Infection may be obvious but there may be no signs at all. Even when there are no signs, infection can still be transmitted and stallions might still 'shed' the virus, ie excrete it in their semen. These stallions are known as 'shedders' and pose a significant risk of disease transmission if undetected. In pregnant mares, abortion may occur. EVA may, occasionally, be fatal.

The main signs of EVA are fever, lethargy, depression, swelling of the lower legs, conjunctivitis ('pink eye'), swelling around the eye socket, nasal discharge, 'nettle rash' and swelling of the scrotum and mammary gland.

## Transmission of Disease

Infection can be transmitted between horses in any of the following ways:

- direct transmission during mating;
- direct or indirect transmission during teasing;
- artificially inseminating mares with semen from infected stallions or which has been contaminated during semen collection or processing. The virus can survive in chilled and frozen semen and is not affected by the antibiotics added;
- contact with aborted fetuses or other products of parturition;
- via the respiratory route (eg via droplets from coughing and snorting).

The shedder stallion is a very important source of the virus. On infection, the virus localises in his accessory sex glands and will be shed in his semen for several weeks, months or years - possibly even for life. The fertility of shedder stallions is not affected and they show no clinical signs but they can infect mares during mating, or through insemination with their semen. These mares may, in turn, infect other horses via the respiratory route.

## Prevention

The main ways of preventing EVA are vaccination, particularly for stallions and teasers, and the establishment of freedom from infection before breeding activities commence.

### Establishing freedom from infection

This involves checking the disease status of breeding stock before commencing breeding activities each year. Veterinary surgeons should take blood samples from horses for testing in a laboratory to detect the antibodies that the horse generates in response to infection with the virus. The horse also generates antibodies in response to vaccination against EVA.



The laboratory detects both the presence and the level of antibodies in the blood ('serological testing').

If antibodies are not present ('seronegative'), the horse is not infected and breeding activities may begin.

The presence of antibodies ('seropositive') may be the result of:

- active infection
- previous infection
- vaccination

In mares, a rising level of antibody in two or more sequential samples indicates active infection and the mare should not be used for breeding activity. A stable or declining level indicates previous infection or vaccination and the mare can be used safely for breeding activity.

A stallion who is shedding virus in his semen is always seropositive but a seropositive stallion is not necessarily a shedder. Therefore, if a stallion returns a seropositive result, it is important to establish whether he is a shedder (see Appendix 4) before use for breeding activities.

### **Vaccination**

Routine vaccination against EVA is particularly recommended for stallions and teasers. In the UK, routine vaccination of mares is not recommended and emergency vaccination might only be considered in exceptional circumstances involving widespread disease outbreaks. One vaccine is available in the UK. Horses that were seronegative before vaccination will become seropositive afterwards. This positive status cannot be differentiated from positive status caused by infection. It is essential, therefore, for breeding and export purposes, to be able to demonstrate that the horse is positive because of vaccination and not infection. This is done by blood testing before vaccination to show that the horse was previously seronegative and keeping a record of the test result, certified by a veterinary surgeon, preferably in the horse's passport. The vaccine should not be administered until the blood test result is available.

Veterinary advice should be sought on the timing and administration of the vaccine. See Appendix 7 for vaccine details.

All vaccinations (primary course and booster doses) should be recorded, preferably in the horse's passport, by the veterinary surgeon who administered the vaccine. Details should include the date and place where the vaccine was given, and the name and batch number of the vaccine.

### **Recommendations for prevention - domestic mares**

The risk associated with any mare can vary. Decisions regarding the testing of mares visiting stallions should therefore be made in conjunction with the attending veterinary surgeon, according to the circumstances of the individual premises and the mare's history and contacts with other horses in the past year.

In any breeding season, the safest option is to blood test all mares whether intended for natural mating or AI after 1st January and within 28 days before use for breeding activities. The mare should not be used until the results are available.

#### Note

AI - See checklist on page 26.

#### Note

'Stallion' means mating stallions, teasers and stallions used for AI.

- If a mare is seronegative, breeding activities may begin.
- If a mare is seropositive and had not previously been shown to be seropositive, she may be infected and must be isolated immediately. Repeat blood samples should be taken at intervals of at least 14 days and sent to the laboratory that tested the first sample. When the mare is no longer infectious, as indicated by stable or declining antibody levels, breeding activities may begin.
- If a mare was seropositive in a previous year and her current test returns seropositive, breeding activities may begin if the antibody level in the current sample is stable or declining compared to the level in her last test (ideally, the laboratory that tested the previous sample should test the current sample). If there is any doubt about the comparison of results, a second test should be done at least 14 days after the first, using the same laboratory. If the antibody level is stable or declining, breeding activities may commence. If it has increased, isolate the mare and consult a veterinary surgeon immediately.

If any mare is seropositive unexpectedly, the in-contacts should be isolated and screened for EVA by blood testing. Any foster mares on the premises should also be tested.

#### Recommendations for prevention - imported mares

Before importing a mare, veterinary advice should be sought on the incidence of EVA in the exporting country and the following precautions taken when the disease is known or suspected to occur in that country:

- Ensure that the mare is blood tested within 28 days before import and proceed only on the basis of a seronegative result or, if seropositive, of stable or declining antibody levels in at least one further test at an interval of not less than 14 days. Between blood testing and import, reasonable precautions should be taken to minimise the risk of infection, such as segregation from unvaccinated stock.
- Immediately on arrival, place the mare in isolation for at least 21 days. Blood tests should be done immediately and repeated at least 14 days later. If the results are seronegative, or seropositive with stable or declining antibody levels, natural mating or AI may begin. If the results are unexpectedly seropositive, or the antibody level is rising, keep the mare in isolation, do not use her for breeding activities and consult a veterinary surgeon about the next steps.

#### Recommendations for prevention - domestic stallions

After 1st January in any year, all **unvaccinated stallions and teasers** should be blood tested. Do not use the stallion for breeding activities until the result is available. If the result is seronegative, breeding activities may commence.

If the result is seropositive, notify the DVM of Defra immediately and isolate the stallion while steps are taken to determine whether he is shedding the virus in his semen (see Appendix 4). He must not be used for breeding activities during this time. If he proves not to be a shedder, he may be used for breeding activities as long as any advice from the veterinary surgeon, and any conditions laid down by the DVM of Defra, are implemented. If he proves to be a shedder, he must remain in isolation until his future is decided. None of his semen should be allowed off the premises and previously released semen should be traced and the recipients notified.

**Vaccinated stallions and teasers** may be seropositive or seronegative, depending on when the last dose of vaccine was given and whether the horse might have become infected since the protection afforded by the vaccine declined. These horses should be blood tested after 1st January. Do not use them for any breeding activities until the results are available. If the result is seronegative, breeding activities may begin. If it is seropositive, the stallion's history in the past 12 months - including dates of EVA vaccinations, results of pre-vaccination blood testing and any post vaccination testing and contacts with other horses since the last vaccination - should be reviewed in consultation with a veterinary surgeon. If there is any possibility that the stallion's seropositive status is the result of infection rather than vaccination, isolate the stallion and notify the DVM of Defra immediately. The stallion should then be tested further to determine whether he is shedding the virus in his semen (see Appendix 4). He must not be used for any breeding activities during this time.

### **Recommendations for prevention - imported stallions**

The following applies to import of stallions normally resident overseas, returning shuttle stallions and stallions who are normally resident in the UK when they have been overseas for non-breeding purposes but will be used for breeding activities upon return to this country.

Using imported stallions for breeding activities increases the risk of spread of EVA because the disease occurs worldwide and is transmitted readily between horses via the respiratory as well as the venereal route. In the UK, the law does not require any official testing of stallions for EVA before importation from EU member states so voluntary testing to establish their EVA status should be undertaken. Official testing requirements exist for imported stallions from non-EU countries. However, they may not be adequate to prevent the import of infection. Also, horses can become infected via the respiratory route during transport with other horses. Additional voluntary precautions are therefore advisable.

Before importing a stallion, veterinary advice should be taken on the incidence of EVA in the exporting country. The importer should take the following precautions when EVA is known or suspected to occur in that country:

- Ensure that the horse is blood tested no more than 28 days before import, and since he was last used for mating. If the result is seronegative, importation may proceed. If the result is seropositive, seek veterinary advice before proceeding. Between blood testing and import,

Note  
Under EU law, the importation of known shedder stallions is not permitted.

reasonable precautions should be taken to minimise the risk of infection, such as segregation from unvaccinated stock.

- Immediately on arrival, place the stallion in isolation for at least 21 days. Two blood samples should be taken, one immediately and the second at least 14 days later. They should both be sent to the same laboratory. If the results are seronegative, breeding activities may commence. If any result is seropositive, notify the DVM of Defra immediately, keep the stallion in isolation and consult a veterinary surgeon about the next steps. The stallion must not be used for mating, teasing or semen collection during this time.

### **Sport horse stallions**

Where stallions are imported into the UK for competition purposes, their EVA status should be established if it is decided, after their arrival, to use them for mating or semen collection while they are in the country. The stallion should be isolated for at least 21 days, and blood tested immediately and again at least 14 days later, using the same laboratory each time. If the results are seronegative, breeding activities may commence. If any result is seropositive, notify the DVM of Defra immediately, keep the stallion in isolation and consult a veterinary surgeon about the next steps. The stallion must not be used for mating, teasing or semen collection during this time.

**Note**  
Equine arteritis virus survives in chilled and frozen semen and is not affected by the antibiotics added.

### **Recommendations for prevention - artificial insemination and embryo transfer**

When semen is collected from a stallion:

- the stallion owner/manager must record the dates of movement of the stallion on and off the premises, collection and movement of semen and insemination of mares at the stallion's premises.
- The disease status of the stallion at the time when the semen was collected must be established by blood testing. If the stallion was seropositive, the semen must not be used unless it can be proved that he was not a shedder (see Appendix 4).

Under EU law, import of semen from shedder stallions is not permitted.

Mare owners planning to use semen from overseas stallions should check the EVA status first. Semen should be accompanied by documentation certifying that the stallion or the semen was tested negative for EVA shortly after the semen was collected in the country of origin. Frozen semen should additionally be tested on arrival in the UK. It is only necessary to test one straw from each ejaculate. If the result is negative, the semen may be used. If it is positive, all straws from that ejaculate should be destroyed. For practical reasons it is not possible to test chilled semen on arrival. Appropriate testing in the exporting country is, therefore, essential. When transferring embryos, whether conceived in the UK or overseas, the disease status of both the stallion and mare at the time of conception must be established. Mares should have seronegative status, or seropositive status with stable or declining antibody levels. Stallions should have seronegative status, or seropositive status with proof that they are not shedders.

## Diagnosis

Because of the variability or the possible absence of signs of EVA, clinical diagnosis is not always possible. Laboratory diagnosis is therefore essential. Laboratories can identify the presence and level of antibodies to the virus by testing blood, and can screen for the actual virus in blood and other samples. Laboratories generally require blood serum for antibody detection and heparinised or EDTA blood (preferably heparinised) or semen for virus detection. Other samples may be required. If in doubt, veterinary surgeons should check with the laboratory.

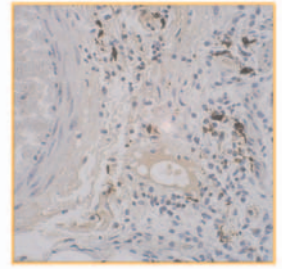
Where abortion or newborn foal death may be EVA-related, a detailed clinical history of the mare must be sent to the laboratory immediately, together with blood samples from the mare, samples of the placenta and the fetus or carcass for specific examination for the EAV.

## Control of Infection

**If EVA infection is suspected in any horse,** stop all breeding activities immediately, notify the DVM of Defra as set out on page 17, isolate the horse(s) concerned and seek veterinary advice about the next steps.

**If EVA is confirmed in any mare, stallion or teaser:**

1. Stop mating, teasing and collection/insemination of semen, and stop movement of horses on and off the premises immediately;
2. Notify the DVM of Defra immediately as set out on page 17 and seek veterinary advice. Any directions given by the DVM must be followed;
3. Isolate and treat clinical cases as advised by the attending veterinary surgeon and/or DVM;
4. Group the in-contacts away from other horses on the premises and ask the attending veterinary surgeon to take samples for virus detection. When the results are available, separate any healthy horses which have tested negative away from those which have tested positive. Horses which have tested positive should be treated as advised by the attending veterinary surgeon and DVM, and kept in isolation until freedom from active infection is confirmed;
5. Ask the attending veterinary surgeon to screen all other horses at the premises by blood testing. If any of these return positive results, they should be separated from those with negative results, and be treated as advised by the veterinary surgeon and the DVM of Defra. They should be kept in isolation until freedom from active infection is confirmed;
6. Arrange for one straw from each ejaculate of stored semen from infected stallions and their in-contacts to be tested by a laboratory. If any straw is infected, all straws from that ejaculate should be destroyed;



7. Inform:
  - owners (or persons authorised to act on their behalf) of horses at, and due to arrive at, the premises;
  - owners (or persons authorised to act on their behalf) of horses which have left the premises;
  - recipients of semen from the premises;
  - the relevant breeders' association;
8. Clean and disinfect stables, equipment and vehicles used for horse transport;
9. Good hygiene must be exercised. If possible, separate staff should be used for each different group of horses to prevent indirect transmission of infection between the groups;
10. Arrange for the attending veterinary surgeon to repeat the blood testing after 14 days and again every 14 days until freedom from active infection is confirmed. Use the same laboratory for repeat samples as for the first samples. If any of the previously healthy or seronegative horses become ill or seropositive, they should be moved into the appropriate group and treated as advised by the veterinary surgeon and DVM. Testing of these horses should continue until freedom from active infection is confirmed. Seropositive stallions and teasers must be investigated to determine whether they are shedders (see Appendix 4). Those which prove to be shedders must be kept in strict isolation until their future is decided and must not be used for breeding activities during this time;
11. Do not resume any breeding activities or movement on and off the premises until freedom from active infection is confirmed in all infected and in-contact horses. Breeding and movement should only be resumed with the approval of the attending veterinary surgeon and the DVM;
12. Pregnant mares must be isolated for at least 28 days after leaving the premises. Those remaining on the premises should be kept in isolation for at least 28 days after active infection has stopped;
13. Any mares who became infected after their pregnancy began should be foaled in isolation. If in any doubt, consult a veterinary surgeon.

## Treatment

There is no treatment available for EVA itself, although there may be treatments to alleviate some of the clinical signs. These should be determined by the attending veterinary surgeon.

## Confirmation of Freedom from Disease

Following infection with EVA, breeding activities should only be resumed with approval from the attending veterinary surgeon and the DVM of Defra, who must be satisfied that infected and in-contact horses have been investigated and subsequently cleared of active infection on the following basis:

### Mares

Prior to resumption of breeding activities, a mare should have two sequential blood tests taken, at least 14 days apart, and tested in the same laboratory. The first test should be taken 14 days after the appearance of clinical signs or contact with infected horses. If the two tests demonstrate stable or declining antibody levels, breeding activities may resume.

### Stallions

Prior to resumption of breeding activities, it must be demonstrated that the stallion is not shedding virus in his semen (see Appendix 4). Semen testing must be carried out in a laboratory designated by Defra.

## Export Certification

For official export certification purposes, samples for EVA blood testing must be sent to the Veterinary Laboratories Agency, Weybridge.

**Note**  
If statutory restrictions have been imposed, the requirements of the supervising Defra officials must be met in order that the restrictions can be lifted.

# Checklist for the use of artificially inseminated semen

All of the bacterial and viral venereal diseases which may be transmitted during natural mating can also be transmitted in artificially inseminated semen, be it fresh, chilled or frozen. Owing to the large number of mares that can be inseminated by an infected stallion and the fact that the diseases are endemic in many countries from which semen may be imported, the potential for disease transmission via the use of artificially inseminated semen is significant. It is therefore essential that no semen is artificially inseminated unless the person performing the insemination can verify the following:

## I. For semen originating within the UK (fresh, chilled or frozen)

A. Each dose of semen must be clearly labelled with:

- i. The name of the stallion;
- ii. The time and date on which the semen was collected;
- iii. The insemination dose per mare;
- iv. The progressive motility of the semen;
- v. The concentration of the (extended) semen.

B. Each dose of semen must be accompanied by a certificate stating that:

- i. The stallion has been tested for the Contagious Equine Metritis Organism, *Klebsiella pneumoniae* capsule types 1, 2 and 5 and *Pseudomonas aeruginosa* according to the current HBLB Code of Practice, with negative results after 1st January of the current year.
- ii. The stallion has *either* been tested seronegative for Equine Arteritis Virus according to the current HBLB Code of Practice after 1st January of the current year or has been vaccinated against EVA having been tested seronegative prior to vaccination or has been tested seropositive, is not vaccinated against EVA but has been proven by virus isolation test not to be shedding the Equine Arteritis Virus in his semen.

## II. For semen originating outside the UK (fresh, chilled or frozen)

A. Each dose of semen must be clearly labelled with:

- i. The name of the stallion;
- ii. The time and date on which the semen was collected;
- iii. The insemination dose per mare;
- iv. The progressive motility of the semen;
- v. The concentration of the (extended) semen.

B. Each and every consignment of semen being imported into the UK from within the EU must be accompanied by a completed intra-community trade certificate (INTRA), specifying the name of the stallion whose semen the certificate relates to and by an original, valid health certificate issued in the country of origin.

C. Each and every consignment of semen being imported into the UK from outside the EU must be accompanied by a completed Common Veterinary Entry Document (CVEDA) and by an original, valid health certificate issued in the country of origin.

**Use of artificial insemination is not permitted where the progeny is to be registered with the Weatherbys General Stud Book.** However, disease spread via AI has the potential to impact on Thoroughbred breeding operations through Thoroughbred/non-Thoroughbred cross breeding.

Full details of the legal requirements for equine semen imported into the UK are available at:

<http://www.defra.gov.uk/animalh/int-trde/imports/iins/genetic/index.htm>

# CODE OF PRACTICE FOR EQUINE HERPESVIRUS

## The Disease

Equine herpesvirus is a common virus that occurs in horse populations worldwide. The two most common strains are EHV-1, which causes abortion, respiratory disease and paralysis, and EHV-4, which usually causes respiratory disease only but can occasionally cause abortion.

EHV abortion can occur from two weeks to several months following infection with the virus. It usually occurs in late pregnancy (from eight months onwards) but can happen as early as four months. Respiratory disease caused by EHV is most common in weaned foals and yearlings, often in autumn and winter. However, older horses can succumb and are more likely than younger ones to transmit the virus without showing signs of infection.

Although EHV-1 causes outbreaks of abortion, EHV-4 has only been associated with single incidents and is not considered a risk for contagious abortions.

## Notification Procedures

There are no legal notification requirements for EHV in the UK although it is advisable to inform the relevant breeders' association if infection occurs.

Because the disease spreads easily between horses and can have severe consequences, it is very important to alert owners of horses which might be at risk of infection through contact with your horse or premises following an outbreak.

## Clinical Signs

Signs of respiratory disease include mild fever, coughing and discharge from the nose.

Live foals infected *in utero* are usually abnormal from birth, showing weakness, jaundice, difficulty in breathing and occasionally nervous signs. They usually die within three days. The most common sign in older foals is a nasal discharge.

There are usually no warning signs of abortion caused by EHV.

Horses affected by paralytic EHV often display inco-ordination of the hind, and occasionally front, limbs, urine retention and, in severe cases, recumbency (lying down and unable to stand). These signs may be preceded by initial respiratory signs.



## Transmission of Disease

Infection can be transmitted between horses in any of the following ways:

- Most commonly, via the respiratory route (eg via droplets from coughing and snorting);
- Contact with aborted fetuses, fetal membranes and fluids; these are particularly dangerous sources of infection;
- Mares who have aborted or whose foals have died transmit infection via the respiratory route;
- Infected foals are highly contagious and can transmit infection to other horses via the respiratory route and by shedding virus into the environment;
- Indirect transmission through the environment because the virus can survive for several weeks once it has been shed by the horse.

All horses can be 'carriers' of the virus, meaning that they may transmit infection without showing signs of illness. In carriers, illness may become apparent from time to time, especially after stress or after suffering another disease. The virus is always contagious at this time.

In late pregnant mares, prolonged transport and other types of stress may increase the risk of fetal infection.

## Prevention

The main ways to prevent EHV infection are good management of breeding stock, good hygiene during breeding activities and vaccination.

### Management of breeding stock

All horses and ponies, including foals, can be a source of EHV. Breeding stock should, therefore, be managed in ways that will minimise the risk of spread of infection between horses:

- Pregnant mares should be kept separate from all other stock;
- Where possible, mares should foal at home and go to the stallion with a healthy foal at foot;
- If foaling at home is not possible, pregnant mares should go to the stallion or boarding stud 28 days before foaling is due. Mares should be isolated in groups with other healthy mares at a similar stage of pregnancy; the groups should be as small as possible;
- Mares in late pregnancy should be isolated individually;
- Mares from sales yards or overseas are a particular risk and should be grouped away from pregnant mares;
- Isolated groups and individuals should be separated as far as possible from weaned foals, yearlings, horses out of training and competition horses. Fillies out of training are a particular risk to pregnant mares;

- Mares in late pregnancy should not travel with other stock, particularly mares which have aborted recently;
- Any foster mare introduced to the premises should be isolated, particularly from pregnant mares, until it has been proved that her own foal's death was not caused by EHV;
- Stallions should ideally be housed in premises separate to the mare operations.

## Hygiene

All horses can be potential sources of infection, and the virus can survive in the environment for several weeks following excretion by a horse. Strict hygiene is therefore essential:

- EHV is destroyed readily by heat and disinfectants. Stables, equipment and vehicles for horse transport should therefore be steam cleaned and disinfected regularly as a matter of routine;
- Staff should be made aware of the risks of transmission of EHV;
- Ideally, separate staff should deal with each group of mares. If this is not possible, pregnant mares should be handled first each day;
- Separate equipment and clean water should be used for each horse or group of horses;
- Staff should wear a new pair of disposable gloves each time they foal a mare and dispose of them safely.

## Vaccination

Vaccination of all breeding stock, under veterinary direction, raises the level of protection against EHV and is believed to be advantageous in preventing abortion storms. However, vaccination will not necessarily provide total protection.

It is recommended that a herpesvirus vaccine, licensed for use as an aid in the prevention of both abortion and respiratory disease caused by EHV-1 and EHV-4, is used for breeding stock.

Veterinary advice should be sought on choice, timing and administration of vaccines. See Appendix 7 for vaccine details.

## Diagnosis

The presence of EHV can only be diagnosed by a laboratory. Where disease is suspected, the attending veterinary surgeon should take the following samples and submit them to a laboratory:

- Suspected respiratory disease: blood samples and nasopharyngeal swabs;
- Following any abortion, stillbirth or newborn foal death: fetus and placenta or foal carcass for specific post mortem examination for EHV;



- Suspected paralytic disease: blood samples and nasopharyngeal swabs. In the event of death, the whole carcass should be submitted (if this is not possible, contact the laboratory to agree appropriate post mortem materials).

Blood samples should be treated with heparin or EDTA to prevent clotting.

For members of the Thoroughbred Breeders' Association in Great Britain, a contribution may be available towards laboratory costs for aborted fetuses or foals which die within 14 days of birth. Further details are available from the TBA.

## Control of Infection

On no account should any horse known or suspected to have disease caused by EHV be sent to a stallion stud or to other premises where there are pregnant or brood mares.

**Where abortion, stillbirth, foal death or illness in a foal within 14 days of birth may be EHV related**, the following actions should be taken:

1. Seek veterinary advice immediately;
2. For abortions, stillborn foals and newborn foal deaths:
  - place the mare in strict isolation;
  - in conjunction with the attending veterinary surgeon, arrange for appropriate samples (see 'Diagnosis' above) to be sent in leakproof containers to a laboratory for specific examination for EHV. These materials must be handled under strict hygienic conditions;
  - ensure that the attendant has no contact with pregnant mares.
3. For sick live foals:
  - place the mare and foal in strict isolation;
  - in conjunction with the attending veterinary surgeon, arrange for samples (usually nasopharyngeal swabs and heparinised or EDTA blood) to be sent in leakproof containers to a laboratory for specific examination for EHV;
  - ensure that the attendant has no contact with pregnant mares;
4. Stop movement off the premises. Do not allow any pregnant mare onto the premises unless EHV is excluded as the cause of the abortion, stillbirth, foal death or foal illness;
5. Disinfect and destroy bedding; clean and disinfect premises, equipment and vehicles used for horse transport under the direction of the attending veterinary surgeon;
6. If preliminary laboratory results indicate EHV, divide pregnant mares with which the infected mare had contact into small groups to minimise the

spread of any infection. If the infected mare was already in a small group of pregnant mares, divide the group into even smaller groups (NB: some may still abort). Any non-pregnant mares with which the infected mare had contact should be segregated from pregnant mares.

#### **If EHV is confirmed:**

1. Maintain isolation, movement restrictions and hygiene measures for at least 28 days;
2. Barren mares, maiden mares and mares which have produced healthy foals at home, can be admitted onto the premises providing there is no sign of infection at their home premises but must be kept separate from pregnant mares;
3. Non-pregnant mares on the affected premises can be moved 28 days after the last abortion, providing they can be isolated from all pregnant mares for at least 56 days. It may be possible, under the direction of the attending veterinary surgeon, to move them earlier than 28 days if:
  - they have been isolated from pregnant mares and handled by separate staff (see Appendix 5);
  - testing of blood samples taken immediately and again 14 days later indicates that they are not infected;
  - there is no other evidence of spread of infection;
4. Pregnant mares due to foal in the current season must stay on the premises until they foal;
5. Mares which have aborted must be kept in isolation from pregnant mares for 56 days after abortion. Present evidence indicates low risk of spread of infection if mares are mated on the second heat cycle after abortion;
6. Mares that returned home pregnant from premises where abortion occurred the previous season should foal in isolation at home. If this is not possible, the stud to which the mare is to be sent in the current season must be informed so that precautions can be taken.

#### **Walking-in mares**

Providing the stallion unit is separated geographically from the pregnant mares, and is attended by separate staff, walking-in can be permitted. Following mating, the mare(s) involved should be isolated from any pregnant mares for at least 56 days.

#### **If paralytic EHV is suspected in any horse:**

1. Seek veterinary advice immediately;
2. Stop all breeding activities;
3. Stop all movement on and off the premises for at least 28 days;
4. In conjunction with the attending veterinary surgeon, arrange for appropriate samples (see 'Diagnosis' on page 29) in leakproof containers to be sent to a laboratory for examination;

5. Divide horses into small groups, keeping pregnant mares separate from all others;
6. Do not allow any pregnant mare onto the premises until EHV has been excluded as the cause of the paralysis;
7. Disinfect and destroy bedding; clean and disinfect premises, equipment and vehicles used for horse transport under the direction of the attending veterinary surgeon.

**If paralytic EHV is confirmed**, policy should be decided with the attending veterinary surgeon. This should include screening and clearance of each group before individuals in the group return home. Individuals should then be isolated at home, especially pregnant mares until after foaling.

**In all the situations above, communication is extremely important.** Failure to communicate can contribute to the spread of infection to the detriment of all owners and their horses, particularly mare owners. The owner/manager of the affected horse(s) or premises should inform:

- The relevant breeders' association;
- Owners (or those authorised to act on their behalf) of:
  - mares at the premises;
  - mares due to be sent to the premises;
- Others:
  - Those responsible for the management of premises to which any horses from the stud are to be sent;
  - Those responsible for the management of premises to which any horses have been sent in the previous 28 days, with the condition that owners of those horses (or those authorised to act on their behalf) must be informed immediately;
  - Those responsible for the management of premises to which any pregnant mares (that have been in-contact after the first three months of pregnancy) have been sent, with the condition that owners of those mares (or those authorised to act on their behalf) must be informed immediately.

## Treatment

Any necessary treatment will be determined by the attending veterinary surgeon.

Vaccination of all horses against EHV-1 and EHV-4 is recommended as a general principle. When cases of EHV paralytic disease occur, caution must be exercised when considering the vaccination of previously unvaccinated horses who may have had contact with the infection and may therefore be in the process of incubating the disease. Experience suggests that vaccination during the incubation stage can increase the chances of paralysis.

## Confirmation of Freedom from Disease

EHV is, to a certain extent, endemic among the horse population in the UK. Total freedom from disease can never be confirmed and vigilance is therefore important in the management of breeding stock, particularly pregnant mares.

## Export

EHV is not notifiable by law. However, no horse with clinical signs or recent contact with the disease should be exported.



# GUIDELINES ON STRANGLES

## The Disease

Strangles is a disease of the upper respiratory tract, caused by the bacterium *Streptococcus equi*. It is endemic within the horse population in the United Kingdom.

## Notification Procedures

There are no legal notification requirements for strangles in the UK although it is advisable to inform the relevant breeders' association if infection occurs.

## Clinical Signs

Affected horses, typically, have a high temperature, cough, poor appetite, nasal discharge and swollen and abscessed lymph nodes of the head. These can appear as open sores. The disease may be fatal if the bacterium spreads to other parts of the body. However, a nasal discharge without glandular swelling is often all that is seen, and the carrier state without any obvious clinical signs is also possible.

## Transmission of Disease

Direct contact between infected horses is the most important means of transmitting the disease but it can be spread by the hands and equipment of staff or veterinary surgeons. The bacterium is shed from draining abscesses and the nose, and it survives in the environment and water troughs. Good hygiene is essential, therefore, in controlling the disease. The incubation period is usually about one week but may be longer.

## Prevention

A vaccine is available for horses in the UK as an aid to the prevention and control of Strangles (to reduce clinical signs and the incidence of lymph node abscesses) when there is a recognised risk of contracting the disease. This vaccine is not licensed for use in pregnant or lactating mares. Veterinary advice should be sought to determine whether this vaccine should be used in other horses, on the basis of specific risk assessment.



All horses entering any premises should be monitored closely, particularly in the period immediately after arrival. Any horse that develops a nasal discharge should be segregated and swabbed by a veterinary surgeon for the presence of *S. equi*.

## Diagnosis

Strangles is diagnosed by laboratory analysis of nasopharyngeal swabs. It is particularly important to sample the back of the pharynx adequately. Swabs with extra long shafts and an enlarged absorbent head can be obtained from the Animal Health Trust, Lanwades Park, Kentford, Newmarket, Suffolk CB8 7UU (01638 552993).

The carrier state may be diagnosed by sequential nasopharyngeal swabs or, preferably, endoscopic examination of the guttural pouches and bacteriological examination of guttural pouch washes.

## Control of Infection

The spread of strangles can be limited by the early detection of shedders among newly affected horses and their in-contacts. Any suspected cases should be segregated immediately. Three nasopharyngeal swabs should be taken at 5–7 day intervals over a two week period and cultured for *S. equi*. Young horses are most susceptible to infection and should be monitored closely.

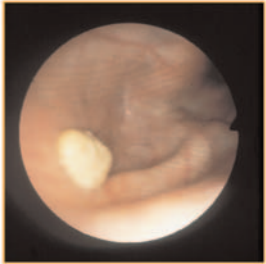
All infected horses and their in-contacts should remain in strict isolation, under the direction of the attending veterinary surgeon, and with the highest possible standards of hygiene.

Horses should not enter an affected premises unless they can be kept in strict isolation from all possible sources of infection.

No infected or in-contact animal should be released from isolation or veterinary supervision until three consecutive negative swabs have been taken over a two week period. Recovered cases may retain potential for carrier status in spite of undergoing three negative swab tests and it is recommended that the guttural pouch, sinus openings and trachea are examined carefully with particular reference to carrier status.

## Treatment

Any necessary treatment will be determined by the attending veterinary surgeon.



## Confirmation of Freedom from Disease

Shedding usually ends rapidly after recovery although it may be intermittent. Therefore, no convalescent horse or in-contact can be considered free from infection until three negative nasopharyngeal swabs have been obtained over a 2 week period. This indicates freedom from infection in the great majority of cases, but not all, so vigilance must be maintained.

## Export Certification

Strangles is not notifiable by law. However, no horse with clinical signs or recent contact with the disease should be exported.

# APPENDIX 1

## Definition of 'high risk' and 'low risk' mares and stallions

'High risk' mares are:

1. Mares from which the CEMO, *K. pneumoniae* (capsule types 1, 2 or 5) or *P. aeruginosa* has been isolated. The 'high risk' status will remain until three sets of negative swabs have been taken at three different oestrous periods in each of two years;
2. Mares which have visited any premises on which the CEMO, *K. pneumoniae* (capsule types 1, 2 or 5) or *P. aeruginosa* has been isolated within the previous 12 months;
3. Mares arriving from Canada, France, Germany, Ireland, Italy, the UK and the USA which have been mated during the last breeding season with stallions resident outside these countries;
4. All mares who have been in countries other than Canada, France, Germany, Ireland, Italy, the UK and the USA within the last 12 months.

'Low risk' mares are any mares not defined as 'high risk'.

'High risk' stallions are:

1. Stallions which have not previously been used for breeding purposes;
2. Stallions from which the CEMO, *K. pneumoniae* (capsule types 1, 2 or 5) or *P. aeruginosa* has been isolated. The 'high risk' status will remain until treatment has been undertaken and required swab results (see page 14, 'Confirmation of freedom from disease') are negative;
3. Stallions which have, in the last 12 months, been at any premises on which the CEMO, *K. pneumoniae* (capsule types 1, 2 or 5) or *P. aeruginosa* has been isolated;
4. Stallions which have mated a mare which has not been swabbed negative in accordance with the Code of Practice.

'Low risk' stallions are any stallions not defined as 'high risk'.

## Contagious Equine Metritis and other Equine Bacterial Venereal Diseases 2007 SEASON

### Mare Certificate

This certificate must be completed by the mare owner/manager and be lodged with the prospective stallion owner/manager before the mare's arrival.

Name of mare \_\_\_\_\_

Passport number (where available) \_\_\_\_\_

Name and address of owner \_\_\_\_\_

Address of premises where mare currently resides \_\_\_\_\_

In 2004 the above mare boarded\* at \_\_\_\_\_ stud  
whilst visiting \_\_\_\_\_ (stallion) result \_\_\_\_\_

In 2005 the above mare boarded\* at \_\_\_\_\_ stud  
whilst visiting \_\_\_\_\_ (stallion) result \_\_\_\_\_

In 2006 the above mare boarded\* at \_\_\_\_\_ stud  
whilst visiting \_\_\_\_\_ (stallion) result \_\_\_\_\_

Additional information including the results of positive bacteriological examinations for the CEMO, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* at any time:

\_\_\_\_\_  
\_\_\_\_\_

Name (please print) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

\*If no boarding stud was used, provide the name and address of the premises where the mare resided.

## APPENDIX 3

### Laboratory Certificate

(Certificat Laboratoire)

## 2007 SEASON

For use only by Approved Laboratories\*

(Laboratoires agréés)

Swabs contained in transport medium and labelled as collected from the stallion/teaser/mare named (Nom du cheval)

Passport number (where available) (Numéro SIRE/carnet signalétique) \_\_\_\_\_

from the following sites (Prélèvements effectués) \_\_\_\_\_

were submitted by (Nom du vétérinaire ayant effectué les prélèvements) \_\_\_\_\_

for bacteriological examination on (date[s]) (Fait le) \_\_\_\_\_

I (Je) \_\_\_\_\_

of (Laboratory) (Nom du laboratoire agréé) \_\_\_\_\_

certify that the above swabs were examined by (Le/la soussigné/e atteste que les prélèvements mis en culture):

- aerobic culture only (culture d'aérobie seulement)       aerobic and microaerophilic culture (culture d'aérobie et microanaérobie)

with the following results (ont livré les résultats suivants)

*Taylorella equigenitalis* (CEMO) (Mérite contagieuse des Equidés)       POSITIVE positif       NEGATIVE négatif

*Pseudomonas aeruginosa* (*Pseudomonas aeruginosa*)       POSITIVE positif       NEGATIVE négatif

*Klebsiella pneumoniae* (*Klebsiella pneumoniae*)       POSITIVE<sup>†</sup> positif<sup>†</sup>       NEGATIVE négatif

Where *K. pneumoniae* was isolated, capsule type(s) identified were \_\_\_\_\_  
Type(s) capsulaire(s)

Name and qualifications (Responsable du laboratoire agréé) (please print) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Laboratory name and address (Nom et adresse du laboratoire agréé) \_\_\_\_\_

\*An Approved Laboratory is one whose name is published in the Veterinary Record by the Horserace Betting Levy Board in December 2006 for the year December 2006–November 2007.

†In the event of a positive *Klebsiella pneumoniae* isolate, capsule typing should be performed and the results detailed to aid the determination of potential venereal pathogenicity.

# APPENDIX 4

## Identifying EAV shedding stallions

When a seropositive stallion is identified, it is vital to establish whether he is shedding the equine arteritis virus (EAV) in his semen. If so, he is a primary source of infection. He must be kept in strict isolation for at least 28 days while the following methods are used under the direction of the attending veterinary surgeon and the Defra DVM to determine whether he is a shedder:

### Detecting virus in semen

The virus isolation (VI) test is the internationally recognised test for the detection of EAV in semen.

A whole ejaculate of semen should be sent to a laboratory; a second whole ejaculate should be collected at least seven days later and sent to the same laboratory. Transport requirements (eg cooling) should be arranged with the laboratory. If EAV is detected in either sample, the stallion is a shedder. He must be kept in isolation and not be used for any breeding activities while he is still shedding, unless permitted under an official licence issued by Defra.

In the event of negative results for both semen samples, experience has shown that it is advisable to confirm these results by test mating.

### Test mating

This must be done in strict isolation and under veterinary supervision. The stallion and mares must have no contact with other horses. The following procedure should be followed:

- Identify at least 2 seronegative mares;
- Take and store blood samples from each and then isolate the mares. Consult the testing laboratory about storage conditions;
- Mate each mare twice a day with the stallion on 2 consecutive days;
- Keep the mares in isolation;
- After 28 days, take blood samples and send them, with the pre-isolation samples, to the laboratory.

If the mares remain seronegative, the stallion is unlikely to be a shedder and can be released after a clinical examination.

If one or more mares become seropositive, the stallion is a shedder. He must be kept in isolation and not be used for breeding activities while he is shedding, unless permitted under an official licence issued by Defra.

Seropositive mares must remain in isolation until they have a stable or declining antibody level in two sequential blood tests taken at an interval of at least 14 days.

# APPENDIX 5

## Guidance on isolation

The Codes of Practice often refer to the isolation of horses. In its strictest sense, 'isolation' means a separate facility with separate staff, separate protective clothing, separate utensils/equipment and thorough steam cleaning and disinfection of stables between each occupant. The following guidelines, at least, should be adhered to:

### Premises

1. The isolation facility should be a separate, enclosed building of sound, permanent construction, capable of being cleansed and disinfected effectively.
2. It must not be possible for other horses to approach within 100 metres of the isolation facility while it is in use.
3. An adequate supply of fresh, clean water must be available at all times for the isolated horses and for cleaning purposes.
4. Adequate supplies of food and bedding material for the whole of the isolation period must be made available and stored within the isolation facility before isolation commences.
5. Equipment and utensils used for feeding, grooming and cleansing must be used only in the isolation facility.
6. Protective clothing must be available at the entrance to the isolation facility and not be taken outside of this facility.
7. A separate muck heap should be used within the isolation facility.

### Procedures

1. Before use, all fixed and moveable equipment and utensils for feeding, grooming and cleansing within the isolation facility must be disinfected using an approved disinfectant. A list of these is provided on the Defra website ([www.defra.gov.uk](http://www.defra.gov.uk)).
2. Attendants of the isolated horses must have no contact with any other horses during the isolation period.
3. The isolation period for all isolated horses shall be deemed to start from the time of entry of the last horse.
4. No person may enter the isolation facility unless specifically authorised to do so.
5. When no attendants are on duty, the facility must be locked securely to prevent the entry of unauthorised persons.

If such strict measures are not possible in practice, the owner/manager of the premises where isolation is needed should devise their own isolation programme and procedures in conjunction with the attending veterinary surgeon. These should include, for example:

- The designation of a yard and associated paddock as an isolation area in a geographically separate area of the premises.
- The designation of individual staff to work in the isolation facility with separate protective clothing and approved disinfectants as and when required. These individuals should either not be involved with work on the rest of the premises during periods of isolation, or they should complete their work on the rest of the premises before entering the isolation area. They should not return to other areas of the premises thereafter.
- The establishment of 'standard procedures', the precise details of which should be agreed with the attending veterinary surgeon as they might vary according to individual circumstances.

# APPENDIX 6

## Transport

There is significant potential for transmission of infectious disease during transport.

Cleanliness and hygiene on board all forms of transport is the responsibility of the vehicle owner in private transport and the vehicle operator in contracted transport. The following notes are for guidance in either case.

1. Vehicles should be cleaned and disinfected frequently and regularly, using approved disinfectants capable of killing bacteria and viruses. A list of these is provided on the Defra website ([www.defra.gov.uk](http://www.defra.gov.uk)).
2. Vehicles should be cleaned before horses are loaded.
3. Prior vaccination of horses may reduce the risk of disease transmission during transport. Ideally, these should be booster vaccinations but, if horses have not been vaccinated previously, then sufficient time should be allowed before transport for both primary and secondary vaccinations to produce adequate immunity.
4. When mixed loads (eg breeding and competition horses; pregnant and non-pregnant mares) are unavoidable, give careful consideration to the categories of horses which are transported together so as to minimise the disease risk (eg risk to pregnant mares of EHV-1 infection; risk of spread of EVA infection).
5. Horses should only travel if they are considered fit to do so by a veterinary surgeon.
6. Sick animals should not be transported except when they are travelling to obtain veterinary treatment. If transport of such horses is unavoidable, they must not be put in mixed loads without the consent of other owners (or those authorised to act on their behalf) of horses in that load. Veterinary advice should be taken.
7. If horses or their in-contacts are ill on, or shortly after, arrival at their destination, veterinary advice should be taken and the sick horses isolated if necessary. The transport operator should be informed at once and should then inform other clients with animals in the same load.
8. Facilities should, if necessary, be made available for cleaning/mucking out of lorries at premises where loading/unloading stops are made.

# APPENDIX 7

## Information on vaccines available in the UK

Brand name	Manufacturer	Licensed
Artervac	Fort Dodge	As an aid in the prevention of EVA
Duvaxyn EHV 1,4	Fort Dodge	As an aid in the prevention of abortion and respiratory disease caused by EHV-1 and EHV-4
Equilis Resequin	Intervet UK Ltd	As an aid in the prevention of respiratory disease caused by EHV-1 and EHV-4 and equine influenza
Equilis StrepE	Intervet UK Ltd	For the immunisation of horses against <i>Streptococcus equi</i> to reduce clinical signs and occurrence of lymph node abscesses

Veterinary advice should be sought on the choice, timing and administration of any vaccine.

**Vaccination is recommended as one means of aiding the prevention of disease. The listing of vaccines above is for information purposes only and does not imply endorsement of the products by the HBLB, its Veterinary Advisory Committee or Sub-Committees. The information given is accurate at the time of printing.**

# APPENDIX 8

## Further reading and relevant publications

### **Infectious Diseases of Horses Order**

Reference: 1987 No. 790. Obtainable from HMSO.

### **Equine Viral Arteritis Order**

Reference: 1995 No. 1755. Obtainable from HMSO.

### **Equine Veterinary Education**

1996 Volume 8 (3) 166–170. Obtainable from Equine Veterinary Journal Ltd, Graseby House, Exning Road, Newmarket, Suffolk CB8 0ES.

### **BEVA Code of Practice for the use of Artificial Insemination in Horse Breeding**

Obtainable from the British Equine Veterinary Association, Mulberry House, 31 Market Street, Fordham, Ely, Cambs CB7 5LQ.

### **Newmarket Stud Farmers Association Breeding Regulations**

Obtainable from Rustons and Lloyd, 136 High Street, Newmarket, Suffolk CB8 8NN.

# APPENDIX 9

## Glossary of terms used in the Codes of Practice

<b>Aerobically</b>	In the presence of oxygen
<b>Antibody</b>	Protective protein produced by the body in response to the presence of a virus or bacteria
<b>Cervix</b>	Neck of the uterus opening into the vagina
<b>Clitoris</b>	A body of tissue found just inside the vulva
<b>EDTA blood</b>	Blood sample which has been prevented from clotting by the addition of ethylenediamine tetra-acetic acid (EDTA)
<b>Endometrium</b>	Tissue that forms a lining inside the uterus
<b>Genitalia</b>	Genital (ie reproductive) organs
<b>Guttural pouch</b>	Two large sacs connected to the tube (eustachian) between the horse's ear and throat
<b>Heparinised blood</b>	Blood sample which has been prevented from clotting by the addition of heparin
<b>Immunofluorescence</b>	A test that uses a specific antibody and a fluorescent compound to detect a specific organism
<b>Jaundice</b>	Condition in which a yellow colour can be seen in the mouth, eye and vagina
<b>Microaerophilically</b>	In the virtual absence of oxygen (10% of carbon dioxide)
<b>Nasopharyngeal swab</b>	Swab taken from the nose and throat
<b>Oestrus/oestrous period</b>	In heat or in season
<b>Placenta</b>	Membrane which surrounds the fetus in the uterus
<b>Polymerase chain reaction (PCR)</b>	A laboratory technique that produces multiple copies of the genetic material of a microorganism contained within a clinical sample (eg swab). The technique amplifies the genetic material so that even tiny amounts can be detected, thereby permitting diagnoses of infections to be made.
<b>Urethra</b>	Tube through which urine is discharged from the bladder
<b>Uterus</b>	Womb
<b>Venereal disease</b>	A sexually transmitted disease
<b>Vulva</b>	External opening of the vagina

# NOTES