CODE OF PRACTICE FOR EQUINE VIRAL ARTERITIS

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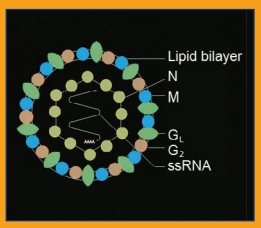


The Disease

Equine viral arteritis (EVA) is caused by the equine arteritis virus (EAV). The virus occurs worldwide in Thoroughbred and non-Thoroughbred populations. EVA has been sporadically reported in the UK, often in association with non-Thoroughbred horses imported from EU countries. The disease epidemiology is complex since it may spread by venereal transmission, but also via the respiratory tract, leading to spread of infection associated with attendance at equestrian sporting events.

Notification Procedures

In the United Kingdom, 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 Animal & Plant Health Agency (APHA) or The Department of Agriculture, Environment and Rural Affairs (DAERA) in Northern Ireland 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.

Please see Appendix 1 for APHA Offices' contact details. Under the Order, there are powers to:

- serve notices prohibiting the use for breeding of the suspect stallion and the collection of semen obtained from the stallion unless permitted under licence by the APHA;
- 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 may publish this fact and the name and location of the stallion concerned, followed by similar publicity if Ministers consider that the disease or virus no longer exists in that stallion.

When statutory powers under the Order are invoked, laboratories will be nominated by the authorities 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 national breeders' association if EAV is isolated.

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 from two months of gestation through to term. 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.

Further clinical details can be found at https://respe.net/maladie-equine/reproduction/arterite-virale-equine-ave/ or https://www.woah.org/en/disease/equine-viral-arteritis

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 (e.g. 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, and occasionally 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.

The 2019 UK outbreaks served to highlight the risk posed by infected stallions transmitting EAV by the respiratory route in the earlier stages of infection, particularly in shared airway stables. The acute stage of infection is usually 2 – 14 days, but can be up to 28 days. There is also evidence to suggest that chronically infected stallions may transmit EAV by other, non-venereal routes (e.g. via handler, tack or equipment contacts following masturbation contamination of the environment). Therefore, unless strict biosecurity is maintained indefinitely, in-contact mares and other equines may be infected.

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. However, the 2019 UK outbreaks demonstrated the capacity for respiratory (non-venereal) spread of infection and the importance of making sure

that horses imported from countries where EVA is endemic into countries where it is not are serologically tested negative for EVA before importation and quarantined, monitored and re-tested after arrival.

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 (serology) 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').

Serological testing for EVA can be either by ELISA or Virus Neutralisation (VN) serum blood tests. Usually screening for EVA in low risk mares is by the ELISA test for a negative result this is normally available as a same or next working day result. If the result is positive confirmation by VN testing, the recognised confirmatory test, is required and undertaken automatically. Occasionally ELISA blood test results can be inconclusive and these will also require VN testing to confirm whether the sample is positive or negative before the mare is available for mating. In this scenario the mare is not cleared for mating until the VN result is available even if a repeat ELISA test or one from a different laboratory is negative in the meantime.

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 antibody 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 5) 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, Equip Artervac (Zoetis), is available in the UK normally.

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. The current datasheet requirement for the only inactivated vaccine against EVA used in Europe presently is for 6 monthly (not annual) boosters. See Appendix 8 for vaccine details.

All vaccinations (primary course and booster doses) must be recorded 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.

- 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 (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

Note
Also see the AI Guidelines on page 95

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

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 or untested 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 Animal & Plant Health Agency (APHA) immediately and isolate the stallion while steps are taken to determine whether he is shedding the virus in his semen (see Appendix 5). 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 APHA, 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.

The current datasheet requirement for the only inactivated vaccine against EVA used in Europe presently is for 6 monthly (not annual) boosters. If the EVA vaccination has lapsed or expired, the stallion may be susceptible to infection and seropositive results should be investigated. If the veterinary assessment concludes that the stallion's seropositive status is likely the result of infection rather than vaccination, isolate the stallion and notify the Animal & Plant Health Agency (APHA) immediately. The stallion should then be tested further to determine whether he is shedding the virus in his semen (see Appendix 5). He must not be used for any breeding activities during this time.

Advice for Owners/Agents of stallions that may be exported either temporarily (shuttle) or permanently

At present, regulations regarding the export of EVA vaccinated stallions to countries outside the EU, such as Australia, are becoming stricter. AQUIS (Australian quarantine agency) require that stallions vaccinated against EVA comply with current OIE guidelines. At present these guidelines state: 'The horse was isolated and a single blood sample taken not less than seven days after commencement of isolation and testing using a virus neutralisation test as described in the OIE Manual for equine viral arteritis with negative results. The horse was then immediately vaccinated against equine viral arteritis and remained isolated from other equids not of equivalent health status for 21 days immediately after vaccination and has been revaccinated regularly according to the manufacturer's recommendations.'

Current Artervac booster vaccinations are recommended every 6 months, which may not be compatible with stallions shuttling to Australia and other countries where Artervac does not have a current licence.

This can lead to problems with a stallion maintaining its correct vaccination history. Other countries such as New Zealand and Argentina have slightly differing import requirements at present.

Any vaccinated stallion that fails to meet import or re-import conditions may be subject to semen testing for EVA culture. It is very important to consult a veterinary surgeon as well as possible shipping agencies with regard to possible exportation of stallions to non-EU countries.

Stallion managers accepting mares for 'walking in' may wish to seek additional reassurance by requesting pre-visit negative serum EVA antibody test results (in addition to routine pre-season tests), where visiting mares are or may be in contact with 'at risk' horses. For Thoroughbred stud farms, this may apply to mares visiting from other stud farms where there is contact with non-Thoroughbred horses.

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.

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

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 or semen collection. If the result is seronegative, importation may proceed. If the result is seropositive, seek veterinary advice before proceeding. 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 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 Animal & Plant Health Agency (APHA) 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 Animal & Plant Health Agency (APHA) 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

Semen should not be used from any stallion unless that stallion has been tested for EVA according to the previous recommendations for domestic (page 26) and imported (page 27) stallions.

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 5).

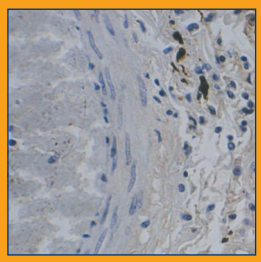
Import of semen from shedder stallions is not permitted.

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 EDTA) 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 carcase for specific examination for the EAV.



Control of Infection

If EVA infection is suspected in any horse, stop all breeding activities immediately, notify the APHA as set out on page 20, 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 APHA immediately as set out on page 20 and seek veterinary advice. Any directions given by the APHA must be followed;
3. Isolate and treat clinical cases as advised by the attending veterinary surgeon and/or officers;
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 local APHA officers, 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 local APHA officers. 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 national breeders' association;
8. Clean and disinfect stables, equipment, including that used for semen collection and processing, and vehicles used for horse transport. DEFRA publishes a list of approved disinfectants at https://disinfectants.defra.gov.uk/DisinfectantsExternal/Default.aspx?Module=ApprovalsList_SI (select only 'General' for products suitable for EVA).
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 the local APHA officers. 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 5). 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 local APHA Field Service office;
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 local APHA officers, 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 5). Semen testing must be carried out in a laboratory designated by DEFRA.

Veterinary surgeons and horse owners should be aware that the current datasheet requirement for the only inactivated vaccine against EVA used in Europe presently is for 6 monthly boosters and NOT 12 monthly (annual) boosters as was previously the case for this vaccine. See Appendix 8 for vaccine details.

Export Certification

For official export certification purposes, samples for EVA blood testing must be sent to the APHA Weybridge (tel: 01932 357335).

Recommendations for the prevention of EVA in the face of an interruption to vaccine availability

In the absence of EVA vaccines, enhanced surveillance and biosecurity measures are essential to mitigate the risk of EVA, especially for stallions. The virus remains endemic in mainland Europe and poses a significant risk of importation, as evidenced by an imported subclinically infected stallion confirmed in Scotland in April 2024.

Veterinary surgeons and equine keepers are advised to implement enhanced testing for stallions. As Artervac does not have DIVA capability (differentiating infected from vaccinated animals), sequential serological testing of lasped vaccinated stallions is recommended.

1. Serum samples taken before the last vaccine booster and at intervals after can confirm stable or declining titres, verifying no new exposure to EAV and that serum positivity is due to prior vaccination.
2. Where prior serum samples are unavailable, PCR testing of semen is advised to confirm that the stallion is not shedding the virus as a single serum sample would not suffice in determining if seropositivity was due to prior vaccination or infection.

Mares recently covered by a stallion with a lapsed vaccination status provide an opportunity for enhanced monitoring to ensure no exposure of stallions while they are at risk of infection for the duration of the time the vaccine is unavailable, conducted alongside the sequential blood testing of the stallion. Testing the mare before and at least two weeks after covering, with paired negative EAV titres, confirms that the stallion is not actively shedding the virus. Fruther ddetails can be found at https://equinesurveillance.org/landing/resources/eids2025ActionWithoutArtervac.pdf

Presentation	Testing option	Confirmation of negative status	Action to be taken non-negative*
Lapsed vaccinated stallion with serum samples taken before the last artervac booster and at intervals thereafter that are stored in a laboratory	Continue sequential serological testing	Stable or declining titres on numerous blood samples tested alongside one another	If rising titres between samples, notify the APHA/DAERA
Additional option for lapsed vaccinated stallions	Blood test mare before and two weeks after covering	Paired negative titres from the mare	Confirm negative prior to breeding
Additional option for lapsed vaccinated stallions	PCR testing of semen	Paired negative titres from the mare	If positive, notify the APHA/ DAERA
Unvaccinated stallions who have never received a vaccine	Single serological sample	Confirm negative prior to breeding	If positive, notify the APHA/ DAERA