



## AFRICAN HORSE SICKNESS

ANIMAL GROUP AFFECTED	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Mainly equidae. Occasionally carnivores, camel, elephant.	Peracute disease: acute respiratory distress. Acute to subacute disease: oedema of supra-orbital fossae, respiratory distress Subclinical: mostly in donkeys, camels and elephants.	Often fatal in horses	Symptomatic to combat lungoedema In non-endemic areas : stamping out of infected animals	Inspection & quarantine. Stabling horses from dusk to dawn. Vaccination

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<b>Susceptible animal groups</b> Horses, mules, donkeys and zebras are susceptible to African horse sickness (AHS) infection. Most susceptible are horses; their mortality rate frequently exceeds 90%. Mules are less susceptible, while donkeys, onagers, zebras, camels and elephants are even more resistant. AHS may cause mortality in domestic dogs following ingestion of AHSV-contaminated meat. African horse sickness also may infect several African carnivore species. However, the role of carnivores in the maintenance of the disease is probably negligible. Camels and elephants can also be infected showing viraemia and antibody development.	
<b>Causative organism</b> The infectious agent is a double stranded RNA virus, within the genus <i>Orbivirus</i> of the Reoviridae family. Nine different AHS-virus serotypes (AHSV 1-9) have been recognised. At room temperature the virus survives for more than a month.	
<b>Zoonotic potential</b> AHS does normally not infect humans, although accidental infections with an aerosol of attenuated vaccine virus have been reported.	
<b>Distribution</b> The disease is endemic in most parts of tropical Africa and possibly Yemen. Rarely the virus makes excursions beyond its endemic areas and has at times extended as far as India and Pakistan in the east and Spain and Portugal in the west.	
<b>Transmission</b> African horse sickness (AHS) is an infectious and non- contagious disease of equidae transmitted mainly by <i>Culicoides</i> spp. (biting midges). As a result the disease has often a seasonal incidence. Windborne dispersal of infected vectors over long distances is possible. The distribution of some important <i>Culicoides</i> vectors is expanding due to some recent modifications of the climate (e.g. <i>Culicoides imicola</i> towards Iberia, Italy, Greece and Switzerland). It seems that transmission via infected injection needles, embryos or sperm collected during the viremic phase of the disease is possible. An infected zebra can remain viremic for 40 days without showing symptoms.	
<b>Incubation period</b> The incubation period in horses is in most cases less than 10 days.	
<b>Clinical symptoms</b> Three clinical syndromes can be distinguished :	



- 1) the peracute or acute pulmonary form has a short clinical course of a few days and is mostly fatal. The disease is characterised by high fever, tachycardia, severe pulmonary oedema, dyspnoea and agonally a frothy nasal discharge.
  - 2) the acute to subacute cardiac form is characterised by fever, oedema of head (particularly the supra-orbital fossae), petechiae on the ventral surface of the tongue, tachypnoea and tachycardia. Sometimes an hydropericard is observed.
  - 3) the febrile form is often subclinical and typical for donkeys or immunised horses. The animals show fever and tachypnoea and after a while they recover.
- Haematological abnormalities in acute and subacute cases of AHS include leukopenia, decreased platelet counts, elevated haematocrit, and increased erythrocyte counts and haemoglobin concentration.

**Post mortem findings**

AHS affects the vascular endothelium of many organs and causes a selective increased permeability of bloodvessels in specific organs, producing oedema of the subcutaneous tissues and lungs, pronounced submucosal congestion of the fundus of the stomach, petechiae and haemorrhages in internal organs, ascites, hydrothorax and hydropericardium.

**Diagnosis**

Isolation of the virus from samples of heparinised blood or spleen (inoculation of cell culture, embryonated eggs or suckling mouse brain) followed by subsequent serotyping of the virus. An antigen capture ELISA test is available for the detection of AHS virus. A reverse transcription polymerase chain reaction (RT-PCR) is able to discriminate between all known members of the AHSV and equine encephalosis virus serogroups. ELISA, virus neutralisation test and complement fixation test is available for serological diagnosis.

**Material required for laboratory analysis**

Heparinised blood or spleen, lung and lymph node samples (preserved in 10% buffered glycerine) and transported at 4°C at the laboratory. For serology paired serum samples should be taken 3 weeks apart and kept frozen at -20°C.

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<b>Treatment</b> In endemic zone: symptomatic treatment. In case of introduction of the disease in non-endemic zone all infected animals will be traced and slaughtered, insects will be controlled and vaccinated equidae identified.
<b>Prevention and control in zoos</b> For equidae originating from at-risk countries outside the European Union a quarantine of at least 40 days and a routine test for AHS is indicated. The introduction of some wildlife species (onagers, zebras, camels and elephants) into AHS-free countries should be considered carefully and restricted to serologically negative animals kept in a quarantine station for 60 days prior to shipment, since the viraemic period in those animals may be significantly longer than in horses and clinical symptoms may be absent. Do not feed equidae suspected of having died of AHS to carnivora.
<b>Suggested disinfectant for housing facilities</b> The disease is arthropod-borne and non-contagious.
<b>Notification</b> Compulsory
<b>Guarantees required under EU legislation</b> Eu guideline 92/35/EEC lays down the control rules and measures to be taken by member countries in case of an AHS-outbreak. EU guideline 90/426/EEC regulates the transport of living equidae.
<b>Guarantees required by EAZA zoos</b>
<b>Measures required under the Animal Disease Surveillance Plan</b>
<b>Measures required for introducing animals from non-approved sources</b> When importing from countries considered infected with AHS, Veterinary Administrations should require for domestic horses the presentation of an international veterinary certificate attesting that the animals: 1) have been exported only during seasons when the insect vectors are at a low level of activity; 2) showed no clinical sign of AHS on the day of shipment; 3) were kept in a <i>quarantine station</i> for a minimum period of 40 days immediately prior to shipment; 4) have been vaccinated against AHS at least 2 months prior to export and have been clearly identified with a permanent mark; or were not vaccinated and were subjected to the diagnostic test for AHS within 10 days prior to shipment with negative results; and 5) were protected from insect vectors during quarantine and transportation to the <i>place of shipment</i> .  Live attenuated polyvalent or monovalent vaccines and more recently new vaccines based on purified and inactivated viral particles from serotype 4 have been developed. A subunit vaccine has been tested but is not commercially available.
<b>Measures to be taken in case of disease outbreak or positive laboratory findings</b> In case of introduction of the disease in non-endemic zone infected animals will be eliminated, non-infected horses will be vaccinated in a zone with a radius of approximately 100 km around the infection source. This, together with a surveillance zone of at least a further 50 kilometres, in which no vaccination will be carried out, would have to remain in force for at least 2 years after the last outbreak. Within and at the border of the infected zone there must be effective veterinary control of domestic horses and other equines and their transportation.
<b>Conditions for restoring disease-free status after an outbreak</b> A country or zone of a country may be restored to AHS free status if: 1) the disease has been notifiable in the whole country for at least 2 years; 2) no clinical, serological (in non-vaccinated animals) and/or epidemiological evidence of AHS has been



found in the country or zone during the last 2 years;  
3) no equine has been vaccinated against the disease in the country or zone during the past 12 months;  
4) no equine has been imported from infected countries or zones except in conformity with the provisions of Article 2.1.11.8. of the International Health Code 2002;  
5) a system making notifiable any mortality in equines has been in force for at least 2 years, and any dead equine has been investigated so as to confirm the absence of AHS;  
6) documented evidence that all the above conditions have been fulfilled were sent to the OIE.

**Contacts for further information**

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