



Equine Research Centre · Onderstepoort

Faculty of Veterinary Science

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EQUINE RESEARCH ... what you need to know

Brought to you by the Equine Research Centre, University of Pretoria

Welcome to the 2nd edition of the Equine Research Newsletter. If you missed the first one, the articles are available on the Equine Research Centre (ERC) Facebook page, and on the ERC page of the University of Pretoria website.

Please share this Newsletter with your members/colleagues/friends – it is important that ALL horse owners are kept informed – we will happily add names to the mailing list on request to nfreeman@witshealth.co.za.

BREAKING NEWS

EXCITING RESEARCH INTO ENSURING HORSES CAN TRAVEL INTERNATIONALLY 'MIDGE FREE'



The first phase of a scientific study investigating the efficacy of meshes and insecticides to protect horses that are being transported from being exposed to AHS has recently been completed and submitted to an international journal for publication. The study, led by Dr Patrick Page under mentorship of Prof Alan Guthrie of the Equine Research Centre, has proven that high density polyethylene mesh impregnated with alphacypermethrin insecticide acts as an effective barrier against and rapidly kills *Culicoides* biting midges. *Culicoides* midges are implicated in the transmission of African horse sickness virus. For the next phase, commercial jet stalls that are currently used to transport horses internationally will be used to evaluate the mesh under field conditions at Onderstepoort. Researchers will evaluate the efficacy of the mesh in protecting horses housed in the jet stalls, effects on stall temperature and humidity and stress of horses under simulated aircraft conditions. The results arising from application to jet stalls could be extrapolated to protecting stabled horses in South Africa.



EFFECTIVE SURVEILLANCE PROTOCOLS CRITICAL TO HORSE EXPORT FROM SOUTH AFRICA

The need for South Africa to comply with the World Organisation for Animal Health (OIE) and the European Union (EU) requirements to allow South Africa to export horses directly without going via Mauritius, prompted the invitation by Wits Health Consortium, in collaboration with the Department of Agriculture, Forestry and Fisheries (DAFF), to Dr Evan Sergeant, senior epidemiologist of AusVet Animal Health Services, Australia, to conduct an evaluation of the AHS surveillance protocols in the AHS Controlled Area, and give recommendations as required.

The Free, Surveillance and Protection Zones (Controlled Zones) in Western Cape were established in 1997 in order to meet with EU requirements for direct exports from South Africa. Subsequent to this there have been several outbreaks in the Surveillance Zone (but never in the Free Zone), which have caused further embargoes on direct exports, the most recent of these being the Mamre outbreak in 2011. The primary purpose of the AusVet project was to develop a surveillance plan for AHS to support a future application for OIE recognition of an AHS Free Zone in the Western Cape Province and to support return of direct horse movements to the EU. The project took place during October 2013, and a draft proposal has subsequently been issued, which is currently under review and awaiting comment from the relevant parties, whereupon it will be finalised, and, hopefully, effectively implemented.

One of the biggest challenges facing the industry is the limited funding available to effectively manage AHS in the country at a provincial level and even more so at a national level. A national surveillance strategy requires additional technicians, researchers and veterinarians, all of whom cost money. Effective communications and education of all members of the equestrian community are also a high priority to ensure compliance. The re-introduction of direct exports will have a profound impact on the industry, and the country's economy as a whole.

TESTING PROCEDURES ON OFFER THROUGH EQUINE RESEARCH CENTRE (ERC)

For diagnostic purposes (in other words to find out if disease is present) the following tests are currently offered:

- AHS and Equine Encephalosis Virus (EEV) real-time RT-PCR (agent identification)
- AHS and EEV viral isolation (agent identification). This testing is conducted in the ERC funded Equine Virology Research Laboratory which is hosted by the Department of Veterinary Tropical Diseases.
- EHV 1 and 4 real-time RT-PCR (agent identification)
- CEM real-time RT-PCR (agent identification)
- *Theileria equi* and *Babesia caballi* real-time RT-PCR (agent identification)
- AHS and EEV testing to certify negative for movement or export (RT-PCR)
- EVA (Equine Viral Arteritis) virus isolation and serology. This testing is conducted in the ERC funded Equine Virology Research Laboratory which is hosted by the Department of Veterinary Tropical Diseases.



In the Western Cape, ERC is also available to assist with disease investigations and diagnostics (if infectious diseases are suspected). This is done in collaboration with, and at the request of the attending veterinarian and State Veterinarian Boland, and is not intended to replace a private veterinarian. ERC supported the State Veterinarian Boland and Malmesbury during the Mamre AHS outbreak, with sample collection, census taking, and vaccinations .

For AHS, EEV, Piro and EHV testing and enquiries please contact Camilla Weyer (equineresearchcentre@gmail.com) or Chris Joone (erc@up.ac.za)

SA LAW IN RELATION TO AFRICAN HORSE SICKNESS

Disease Reporting:

As a controlled disease in terms of the Animal Diseases Act of 1984, all suspected and confirmed cases of AHS must, by law, be reported to the Department of Agriculture, Forestry and Fisheries (DAFF) via the local State Veterinarian. Equine Research Centre (ERC), in particular, Dr Camilla Weyer, follows up on all suspect and positive cases, by contacting whoever has submitted samples, ensuring they have the relevant forms to complete, and even completing the forms on their behalf where necessary, and ensures that the process is completed by the report to DAFF.

In addition, every sample tested for AHS is reported to DAFF and the local state veterinarian of the area from which the sample was sent.

For the reporting system of the ERC and other laboratories, DAFF and Local State Veterinarians to be truly effective we must rely on horse owners and/or private vets to correctly report ALL suspect AHS cases to their local state vets, and to ensure that the correct samples are taken to ensure diagnostic accuracy and disease confirmation. Please do not hesitate to contact Dr Camilla Weyer for further questions regarding sample collection and reporting.

Vaccination:

According to the Animal Diseases Act of 1984, all horses except horses in the African horse sickness free zone and the African horse sickness surveillance zone shall between the ages of 6 and 12 months, then between the ages of 12 and 18 months and then again once every year thereafter be immunized with an effective remedy. A remedy is defined under the Act as any stock remedy which has been registered under Act 36 of 1947, including any medicine or veterinary medicine as defined in section 1 of Act 101.

Equines in the African horse sickness free zone and surveillance zone shall only be immunized with the written permission of the director.

It's that time of the year when our horses are susceptible to AHS – what do you need to do if you have a horse with suspected AHS?

- AHS is a controlled disease, and all suspected and confirmed cases must, by law, be reported to Department of Agriculture, Forestry & Fisheries (DAFF);
- If you have a suspect case in your yard, you need to get a blood sample from the affected horse to ERC (Onderstepoort) as quickly as possible. You can ask your vet to do this, or alternatively please



either contact your local State Veterinarian or Dr Camilla Weyer or N-J Freeman (contact details in this Newsletter) who will assist you.

- All cases will be treated with utmost confidentiality by ERC. Please note that ERC will only assist with the submission and testing of samples, not the actual treatment of horses, which is the responsibility of you and your veterinarian.
- Attached please find the Sample Submission Form which needs to be completed and submitted with your sample – we advise that you keep this on file.

On behalf of all horse owners, we thank you for acting responsibly.

A simplified 'Refresher' on Clinical AHS Symptoms

The disease manifests in four ways, namely the lung form, the heart form, the mixed form and lastly the Horse sickness Fever form.

The lung (dunkop) form is characterised in the following manner:

- Very high fever (up to 41 degrees)
- Difficulty in breathing, with mouth open and head hanging down
- Frothy discharge may pour from nose
- Sudden onset of death
- Very high death rate (90%)

The heart (dikkop) form is characterised in the following manner:

- Fever, followed by swelling of the head and eyes
- In severe cases, the entire head swells ("dikkop")
- Loss of ability to swallow and possible colic symptoms may occur
- Terminal signs include bleeding (of pinpoint size) in the membranes of the mouth and eyes
- Slower onset of death, occurring 4 to 8 days after the fever has started
- Lower death rate (50%).



The mixed form is characterised by symptoms of both the dunkop and dikkop forms of the disease (this is what is seen very commonly in the field).

The Horse Sickness Fever form, presents as a horse that might be mildly depressed, and has a fever, which can be intermittent and last for 48 hours.

Please also do not forget, as mentioned below, that it has been shown that subclinical cases (i.e. horses that are infected with the virus but show no symptoms) can also occur.

Diagnosis and Notification

The symptoms described above may assist with an initial diagnosis of AHS. However, this diagnosis can only be confirmed by identifying the virus in a laboratory. It is for this reason that it is essential that blood samples be taken from the horse for analysis.

NOTE : extract from Onderstepoort Biological Products leaflet



Summarised Scientific Publications



IMMUNISED HORSES MAY STILL CONTRACT AFRICAN HORSE SICKNESS IN THE FIELD

The Equine Research Centre sought to determine whether subclinical cases, as well as clinical cases, of African horse sickness (AHS) occur in immunised horses in field conditions in a high risk area. The team used 50 Nooitgedacht ponies resident in open camps at Onderstepoort, where clinical cases of AHS still occur regularly within the herd and prevalence in the area is high. The aim of the study was to follow a herd of systematically vaccinated horses, ranging in age from foals to horses over 20 years old, in an area that is high risk for AHS during the AHS season and establish whether subclinical cases of AHS (in other words whether horses could be infected with AHS virus without showing a single symptom) occurred naturally in field conditions (not experimentally infected).

During the study, over a two year period, 16% of the horses became infected with the AHSV; with half of these (8%) being sub-clinically infected (these horses showed no outward symptoms of disease at all). The recently developed RT-PCR test was used to test the presence of AHSV RNA in the horses. The study showed that horses that have been vaccinated against AHSV can still be infected both clinically and sub-clinically with AHSV in field conditions. The level of the presence of the virus in the bloodstream in the sub-clinically infected horses could be sufficient to infect midges with AHSV.

The potential impact of such cases on the transmission of AHS warrants further investigation. However, the quick diagnosis of both clinical and sub-clinical cases by using the recently developed RT-PCR tests goes a long way to assisting in the control of the disease.

Publication : *Equine Veterinary Journal* Vol 45 (2013) Pg 117-119 – African horse sickness in naturally infected, immunised horses.

Research Team

Equine Research Centre – C T Weyer, C Joone, C W Lourens, A J Guthrie

Dept of Veterinary Tropical Diseases, University of Pretoria – M Quan

Dept of Pathology, Microbiology and Immunology, University of California, USA –N J MacLachlan

FIRST DOCUMENTED CASE OF AFRICAN HORSE SICKNESS IN A DOMESTIC DOG, WITHOUT APPARENT INGESTION OF HORSE MEAT

Strange but true – a dog living in a controlled and monitored environment, the Malelane Research Unit (MRU – a Good Clinical Practice and Good Laboratory Practice accredited research facility), contracted African horse sickness without having ingested any horse meat. This is the first scientifically documented case of a dog being infected without having eaten horse meat.

The dog died after a week-long illness despite therapy, and the RT-qPCR tests at the post-mortem showed the organ samples to be strongly positive for African horse sickness virus (AHSV).

All previously documented outbreaks of AHS in dogs have followed the ingestion of horse meat. Transmission of AHSV to dogs by midges (*Culicoides* spp) has not been considered to be important in the epidemiology of AHS, as it was believed that midges do not readily feed on dogs.



The MRU is located in the lowveld of the eastern Mpumalanga Province about 20km from the southern border of the Kruger National Park and within 5km of other zebra populations on privately owned land. At the time when the case occurred there were 57 dogs at the facility, that were individually housed, with complete vaccination, arrival date, birth date, microchip number and previous treatments all meticulously recorded for each dog. Investigation into the food fed to the dogs revealed that no horse meat was used as an ingredient. All the dogs had been at the facility for a minimum of 4 years, having either been born there, or arrived as puppies. They had no contact with other domestic animals (horses, cattle, sheep, and rabbits).

It is therefore concluded that it is likely that AHS is able to be contracted in dogs by natural infection. This case has a significant practical implication for the understanding of the transmission and control of AHS. Although vector-borne transmission is likely in this case, further investigations are required before conclusions can be drawn about possible vectors and the transmission and control of the disease.

Publication : Journal of the South African Veterinary Association, Vol. 84, No.1 (2013) – Occurrence of African horse sickness in a domestic dog without apparent ingestion of horse meat.

Research Team

MSD Animal Health, Malelane Research Unit – Sybrand J van Sittert, Tom Strydom

West Acres Animal Hospital, Nelspruit – Tesa M Drew

Chief State Veterinarian, Nkomazi, Tonga Stage Veterinary Office – Johann L Kotze

Equine Research Centre, University of Pretoria – Camilla T Weyer, Alan J Guthrie



YOUR QUESTIONS ANSWERED

Question : Do you know if there are any governmental protocols in place to prevent the movement of unvaccinated carriers like zebra and donkeys into the AHS controlled zones? There are more and more game farms being developed in these areas. Should we be concerned?

Answer : Attached is the movement control protocol that expressly describes the movement protocols for zebra and donkeys (described under the movement of non-registered equids). Cape Nature governs the movement of Zebra and they are aware of these protocols. More education is needed regarding the movement of donkeys although these movements are probably infrequent.

Question : Why is it currently so difficult to obtain vaccines?

Answer : We have been informed that all sales of the OBP vaccine is now strictly through an agent (Bayer - UTI), and direct sales from the OBP to the public, veterinarians included will no longer happen. Therefore Bayer would most likely be the first line for information, and failing that, OBP themselves. There are contact details on their website (<http://www.obpvaccines.co.za/customer-complaint-comment-compliment>).

If you have a question, please don't hesitate to e-mail N-J Freeman on nfreeman@witshealth.co.za, or either of the two addresses below. We will get back to you as soon as possible.

Contacts: Prof Alan Guthrie – alan.guthrie@up.ac.za, 012 529 8068

Dr Camilla Weyer – camillaweyer@gmail.com, 083 710 2408

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