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Faculty of Veterinary Science

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, Faculty of Veterinary Science,

University of Pretoria

We're proud to present our 9th Issue of the ERC Newsletter. Thank you to those who give positive feedback, and who share and distribute to their horse loving friends and colleagues. To have your details added to the mailing list please e-mail Nora-Jean (NJ) Freeman on nfreeman@witshealth.co.za. Likewise, if there is any information you would like us to include (the first article below is the result of a query from a reader), please don't hesitate to ask NJ. Please take all necessary precautions with your horses to minimise the risk of AHS this season – suggested precautions were listed in Issue 7, August/September 2014.

AHS VACCINE ADMINISTRATION AND AFTER-CARE MYTHBUSTED

HOW TO USE/ADMINISTER AFRICAN HORSE SICKNESS (AHS) VACCINE

AHS vaccine is produced by Onderstepoort Biological Products (OBP) under strict requirements and quality control testing dictated by the license for registration under Act 36 of 1947. It is registered for use in South Africa and Namibia.

OBP include a package insert with details of how the vaccine should be stored and administered. The vaccine contains live attenuated African horse sickness virus strains. That is why it is essential that the vaccine is stored in a refrigerator at a temperature of 4°C to 8°C, why the vaccine should not be used after the expiry date and why only healthy animals should be vaccinated.

SEROTYPES INCLUDED IN THE VACCINE

There are 9 known serotypes of African horse sickness. Seven of these serotypes are currently included in the OBP vaccine (Serotypes 1, 3 and 4 in bottle 1 and serotypes 2, 6, 7 and 8 in bottle 2). The serotypes that are excluded are serotype 5 and serotype 9. Serotype 9 has never been included in the OBP vaccine because until recently, serotype 9 rarely occurred in the southern African regions and there is cross protection between serotype 6 (included in the vaccine) and serotype 9. Serotype 5 used to be included in the vaccine but was removed after there were reports of severe vaccination reactions in young animals and serotype 5 was implicated. There is cross protection between serotype 8 (included in the vaccine) and serotype 5.

The following sections in inverted commas and italics have been copied from the OBP AHS vaccine package insert:

"The vaccine is presented as two separate injections with different horse sickness virus types. First administer combination 1 and at least three weeks later combination 2."

Because there are so many serotypes of AHS, it is a big challenge to the horse's immune system to build up an immunity, so the vaccination protocol divides the vaccine to give the horse the best possible chance of developing an immunity to as many of the serotypes as possible.

"The vaccine will not necessarily stimulate a complete immunity in all animals and additional measures must necessarily be taken to ensure protection of horses against horse sickness during the time of the year when the risk of transmission of infection by biting insects is greatest."

Some veterinarians prefer administering bottle 2 first in young horses that are vaccinated for the first time as they believe administering bottle 2 first decreases the chance of a vaccine reaction. It is important to discuss any deviation from the vaccination protocol with your veterinarian or the registration holder (OBP).

INTERVAL BETWEEN BOTTLE 1 AND BOTTLE 2

The recommended interval between combination 1 ("bottle 1") and combination 2 ("bottle 2") is a minimum of 3 weeks. Although there is no scientific information or record regarding the maximum period between administering bottle 1 and bottle 2 for AHS, it is recommended to stick to 21 to 28 days. This is due to the cross-reactivity of the serotypes and their respective combinations in bottle 1 and 2. Bottle 2 should in essence be regarded as a "booster" vaccine (with the serotypes in bottle 2 providing an enhanced immune response to their respective cross reacting serotypes in bottle 1) so the principle that applies to booster vaccines, applies to the interval between AHS 1 and AHS 2. The vaccination date is regarded as the date the second of the two combinations was administered.

VACCINATION AGE

"Foals born of unvaccinated dams can be inoculated at any age but foals of immune dams should not be vaccinated until they are at least six to seven months old. Animals should preferably be immunised during early summer. Immunisation of mares should be avoided during the first three months of pregnancy. Annual immunisation is recommended. It takes up to 2-3 vaccinations for horses to become immune to all serotypes in the vaccine. It is therefore important to combine vaccination with the control of the Culicoides midges which transmit the disease. Horses can be protected from midge bites by stabling them from dusk to dawn, using insect repellents and keeping animals away from low-lying vlei areas or other surface water during the day."

According to the Animal Diseases Act 35 of 1984, it is compulsory to vaccinate all horses in South Africa, except horses in the African horse sickness free zone and the African horse sickness surveillance zone, between the ages of 6 and 12 months, then between the ages of 12 and 18 months and then again once every year thereafter with an effective remedy. The OBP vaccine is the only registered vaccine for AHS in South Africa. For movement into the African horse sickness Controlled Area in the Western Cape *or* to compete in sporting events *or* to be able to race, AHS vaccinations using a registered vaccine have to be done by a registered veterinarian.

EFFECTS OF THE VACCINE

"Animals inoculated for the first time may react slightly between the seventh and fourteenth day following inoculation. During this period and for a further week these animals should not be worked excessively. Immunity starts to develop two to three weeks after complete inoculation and protection against some of the virus types are achieved after four weeks. Immunity cannot be guaranteed in all animals."

The above recommendation is based on the fact that the vaccine contains live attenuated virus strains and the vaccine results in a considerable challenge to the immune system, especially in horses vaccinated for the first few times. Compare this to a doctor's advice that you rest during a bout of influenza. Some horse owners use parameters for e.g. temperature reaction to determine when/whether they rest their horse completely/keep up light work/keep work constant during AHS vaccination. No two horses are the same therefore it is impossible to give any guidelines. The advice of the vaccine manufacturer and the consulting veterinarian should be adhered to.

SUSPECTED VACCINE REACTIONS/VACCINE FAILURE

"Although this product has been extensively tested under a large variety of conditions, failure thereof may ensue as a result of a wide range of reasons. If this is suspected, seek veterinary advice and notify the registration holder."

Whilst care is taken to ensure a safe and effective product, when dealing with biological systems, there is always a chance that there may be unexpected vaccine reactions or apparent vaccine failure. Any suspected vaccine reaction or vaccine failure should be reported to the vaccine manufacturer, OBP, so that a full investigation can be conducted.

Please complete a customer complaint by logging onto the OBP website, and filling in the customer complaint form. http://www.obpvaccines.co.za/customer-complaint-comment-compliment
Please supply as much information as possible.
It would be appreciated if you could also advise Dr Camilla Weyer, equineresearchcentre@gmail.com , that you have logged a complaint and provide her with details.

AHS VACCINE AVAILABILITY

There has been much anxiety over the unavailability of AHS vaccine at a critical time when all horse owners planned to vaccinate their horses. The following notification (next page) has been received from OBP in connection with the availability of AHS vaccine are copied below (we published the first release in our Aug/Sept Issue). Please keep in contact with your local veterinarian regarding AHS vaccine availability.

ONDERSTEPOORT
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07 November 2014

Dear Customer

RE: PRODUCT AVAILABILITY AT OBP

As a follow up to our last communique released in August 2014 regarding product availability; progress has been made with the equipment upgrade, troubleshooting production processes and staff training which are all requirements to move to cGMP (current Good Manufacturing Practice). As indicated previously changing from old to new processes has its own inherent risks but OBP can now report some success. OBP managed to produce and release before and during October nine of the twelve products, which were affected.

OBP promised to start releasing products from October 2014 and have kept to that promise. Since late September 2014, products such as African Horsesickness (AHS), Rift Valley fever (RVF) and Brucella S19 have been released steadily in small quantities weekly to cover the back-log. However, some difficulties remain which affect the expected delivery dates for B-Phemeral and Bluetongue (BT).

The BT vaccine is available as three bottles in a single box. Not all of these will be available as usual in the box. The outstanding bottle/s will be distributed to points of sale; 4 – 6 weeks later. Scientific opinion suggests that injecting first with the supplied bottle while waiting for others to be finally packed will not compromise the immune status of sheep. It is also expected that B Phemeral will be available in late November.

The table below summarises key products that have been produced and also what should be expected late November and early December 2014.

Products	Doses released	Doses expected late November 2014
Bluetongue	1 000 000 (available)	2 000 000
AHS	29 820 (last week)	360 000
Brucella S19	320 000	135 000
B. phemeral	In test	37 560
Rift Valley fever live	2 083 300 (available)	Same quantities still available
Rift Valley fever Inactive	In test	>25 000

OBP is committed to producing and supplying quality products, and satisfying our client's need is our priority. We will keep all our stakeholders informed about our progress on a regular basis while we also appeal for your patience and continuous support.

We once again apologise for any inconvenience caused. Should you have any enquiries or need clarification and further details on the matter, please contact Dr Jacob Modumo at 012 522 1518 or 082 547 1115.

Yours sincerely

Dr Steven Cornelius
CHIEF EXECUTIVE OFFICER

WHY DO WE NEED MONITORING, SURVEILLANCE AND MOVEMENT CONTROL, AND WHAT ROLE WILL A CENTRAL DATABASE PLAY IN THE EFFECTIVENESS THEREOF?

The South African economy will greatly benefit if the restrictions placed on export of horses are reduced. Not only SA racehorses are in demand internationally, but also sport horses and endurance horses. While some may feel that the focus here is purely on the wealthy who are able to export their horses or compete internationally, it should be noted that the knock-on effect of an improved economy will be of benefit to ALL equines, in terms of funds becoming available for vaccine development, diagnostics etc.

In order for South Africa to make progress in this respect, we need to meet certain requirements of the OIE and EU, most important of which is an AHS Free Zone.

The OIE requires the following :

- historical freedom or an effective surveillance programme has demonstrated no cases of AHSV in the last two years;
- systematic vaccination for AHSV is prohibited in the surveillance and free zone;
- movements into the zone comply with the *Code*;
- regular reporting, documentation of surveillance and regulatory measures;
- a surveillance system, under the control of the competent authority that includes:
    - systems for detection and investigation of outbreaks;
    - methods for early detection of clinical cases and for demonstrating absence of AHSV infection in the absence of clinical signs of disease;
    - procedures for rapid collection and transport of samples from suspected cases to a laboratory for diagnosis
    - systems for recording, managing and analysis of diagnostic, epidemiological and surveillance data;
    - All suspected cases of AHS should be investigated immediately and samples should be taken and submitted to a laboratory. This requires that sampling kits and other equipment are available for those responsible for surveillance;
    - surveillance for both early detection of clinical cases and for demonstrating absence of circulating AHSV in the absence of clinical signs;
    - may include elements of clinical, serological, virological and vector surveillance, depending on the epidemiology of the disease in the population;
    - consideration of the epidemiology of the disease in the country/area and the potential role of wildlife.

The European Union (EU) requires, amongst other things, that :

- registration of holdings and equids in the Free Zone is done;
- agreed movement controls are in place for equids moving into the Free, Surveillance and Protection Zones;
- clinical surveillance for early detection of AHS must be in place in the Free and Surveillance Zones;
- 60 unvaccinated sentinel equids, geographically dispersed through the Free and Surveillance Zones, be monitored serologically for evidence of seroconversion on a monthly basis, year-round.

Furthermore it is required that private veterinarians and the general public make immediate notification of suspected cases to state (Provincial) veterinarians. State Veterinarians then notify confirmed outbreaks at the national level by SR1 form. State Veterinarians also provide updates via routine monthly state veterinary reports.

International reporting obligations include:

- Immediate notifications to OIE for outbreaks in the AHS controlled area
- 6-monthly reporting to the OIE – all reported outbreaks
- Annual report to the OIE
- Monthly reporting to SADC and AU-IBAR – all reported outbreaks

Without an auditable, central data system it will be very difficult to meet with the above requirements.

Vaccination Coverage

The OIE *Code* requires that systematic vaccination against AHSV is prohibited in the proposed Free Zone, although resident animals may be vaccinated with permission of the relevant authority and vaccinated animals can move into the zone provided they comply with other requirements. The proposed zone complies with this requirement and vaccination is only allowed with permission of Western Cape Veterinary Services. However, because of the need for vaccination of introduced animals and the necessity to vaccinate animals prior to their movement to the AHS infected zone, a large proportion of the horses in the surveillance zone have been vaccinated. This does complicate surveillance significantly, particularly for identification of sentinels and interpreting serological results in vaccinated horses.

It also highlights the importance of a reliable horse identification system and ability to maintain an accurate vaccination history for horses in the AHS Controlled Area.

Horse Movement Control

Movements of horses into the AHS Controlled Area occur on a permit system and are subject to specified conditions. Over the past three years, between 2,500 and 3,000 pre-notifications of individual horse movements have been made to State Veterinarian Boland for approval each year. The sheer volume of movements raises a number of specific concerns, including the ability to provide timely approval, inconsistency of application of the movement requirements in some cases and difficulty in managing the resulting data to keep track of individual movements and provide a clear and well-documented record.

A simplified, central database will greatly add to the efficiency of movement procedures and authorisations.

Following is what a central database must help us achieve:

- Demonstrate knowledge of horse numbers, identification and location within the Free and Surveillance Zones;
- Maintain and document adequate surveillance;
- Manage and document movement controls and permits for movement within the various zones;
- Manage AHS vaccination approvals and documenting vaccinations in the various zones;
- Manage information generally to demonstrate a thorough understanding of the horse population, movements, surveillance and vaccinations.
- Ability to manage data for both the AHS controlled area and the rest of South Africa;
- Ability to meet DAFF's national and international reporting requirements;

Specific functional requirements should include management of:

- Horse identification and census, linked to owners and properties (mainly AHS Controlled Area);
- Disease reporting/notifications and follow-up (all of SA);
- Managing movements by permit and/or notification (into and within AHS Controlled Area);
- Managing vaccination approvals and notifications (mainly AHS Controlled Area);
- Managing active surveillance programmes (AHS Controlled Area);
- Integration with laboratory systems;
- Interactive mapping of cases.

A key requirement for OIE Zone freedom and particularly for EU access is the maintenance of clear and auditable documentation in support of the application. This is currently a difficult area given the diversity of information and systems used to record the various data, including laboratory testing results, surveillance data, horse identification and census data, movements and vaccinations. Lack of a consistent, transparent and auditable system for documentation and recording of activities could jeopardise future applications for Zone freedom.

SUMMARISED PUBLICATIONS

THE EFFECT OF CONSIGNMENT TO BROODMARE SALES ON PHYSIOLOGICAL STRESS IN PREGNANT THOROUGHBRED MARES

Background

The physiological stress response in horses involves various metabolic, immunological and neuro-endocrine mechanisms. Chronic exposure to stress may result in immunosuppression and an increased susceptibility to disease. The least invasive method of measuring stress is faecal glucocorticoid metabolite (FGM), the advantages of which are that faeces are easily collected with minimal handling of the animal, and the FGM concentrations measured reflect cumulative secretion and elimination of hormones over several hours.

It has been suggested that one of the key causes of Equine herpes virus (EHV) abortion is stress-associated reactivation of latent infection. Relocations, including sales' consignment and the introduction of new mares into established groups are associated with subsequent EHV-associated symptoms including abortion. In such cases it is assumed that the relevant potential stressors include social, environmental and management associated cues.

The primary aim of this study was to investigate changes in FGM measurements during the course of the events associated with routine sales consignment of pregnant broodmares.

Methods and study design

Twenty-six Thoroughbred brood mares of 7 or more months gestation, resident on the same farm in KZN. The Sales mares were removed from their original respective groups approximately one month prior to the sales, and transferred to a common, separate paddock within sight and sound of their original paddock group mates. Six mares, of a similar stage of pregnancy but not destined for sales consignment were selected as the Control group. Twelve additional mares were monitored to increase the number of data points for analysing the relationship between FGM levels and body temperature.

The key events identified as potential stressors in Sales mares were:

- Temporary removal for pregnancy confirmation five days prior to the Sale;
- Washing and grooming two days prior to the Sale;
- Transportation by road to an unfamiliar sale, 30km away, taking one hour;
- Being stabled individually at the venue prior to and after the short duration of the auction process in the sales ring;
- Returning to the farm on the same day;

- Upon return being maintained as a single, separately managed group as a biosecurity precaution until foaling.

Results

Interestingly the FGM levels of both Sales and Control mares showed an overall increasing trend of between the pre-sales period and the initial post-sales period, before returning to pre-sales levels again.

The use of FGM levels as a means of monitoring stress associated with sales consignment was supported by the data collected. The major stressful events (i.e. transport to, individual stabling and sales' ring appearance, and return from sales) on the day of the sales were associated with a significant rise in FGM levels 3 days later, which accounts for the expected lag time of 24-48 hours before the respective changes would appear in the faeces.

An interesting, if unexpected, finding was that mares that were not consigned for sale showed significantly higher pre-sales FGM concentrations than the Sales mares at nearly all time points, and a rise in FGM concentrations in the days after their herd mates had been taken to the sales. Although it is difficult to separate the individual stressors that contributed to the observed response, it suggests that social disruption may be a key stressful event among settled groups of horses, which echoes a previous study investigating the effects of social instability on chronic stress. The raised FGM concentrations in control mares (not consigned to sales) may have been influenced by a 'neighbour' stress effect, given that the consigned mares remained within sight and sound of their previous group mates on all except the day of the sales. It is also probable that removal of an animal from a group disrupted the social order resulting in a stress-related period during which the new 'pecking order' needed to be established.

The comparatively high FGM levels in the non-consigned mares subsequent to disruption of their group stability shows that cognisance should also be taken of the susceptibility of mares to stress in a group from which others have been removed. It is, however, less easy to interpret why the Sales mares did not show higher FGM levels in the pre-sales period as a result of removal from their group and introduction to a new, smaller group.

Conclusions

This study described a novel approach to quantify physiological stress in Thoroughbred brood mares during late gestation after their exposure to potential stressors associated with the reactivation of EHV and associated abortion. The study provided useful preliminary data to support the value of FGM monitoring as a minimally-invasive but reliable method for monitoring stress when investigating EHV reactivation.

Publication : *The effect of consignment to broodmare Sales on physiological stress measured by faecal glucocorticoid metabolites in pregnant Thoroughbred mares – BMC Veterinary Research 2014, 10:25 – www.biomedcentral.com/1746-6148/10/25*

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