



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 our 5th Edition of the ERC Newsletter which is proving to be increasing in popularity. We encourage associations and groups to continue to distribute this newsletter to your members - all horse owners have the right to be kept informed. If you have received this via a friend or association, please feel free to request your details to be added to the mailing list by e-mailing Nora-Jean (N-J) Freeman on nfreeman@witshealth.co.za.

UNPRECEDENTED AFRICAN HORSE SICKNESS OUTBREAK IN WESTERN CAPE

There are a few anomalies attached the current outbreak of African horse sickness (AHS) in the Western Cape. Apart from the fact that these cases have occurred in the AHS Controlled Area of the Western Cape, many of the positive cases have even surprised owners as the horses have shown no clinical signs of the disease. Furthermore, although the number of cases is higher than in previous years, there have been fewer fatalities.

The ERC team is working with State Veterinarians in the Western Cape to ensure effective surveillance and containment of this unprecedented outbreak. Unfortunately, the number of cases is proving a tall challenge for the very small group of staff available to deal with it. Further investigations are certainly required to identify the cause of this outbreak in an effort to prevent a reoccurrence. Clearly this does not help those battling with the disease currently, and our thoughts and sympathies are with all these owners.

Statistics for Porterville and Wellington received thus far :

Ratio of positives in vaccinated horses to unvaccinated horses : 1.36 : 1. There are 22 cases which have unknown vaccination status at present.



No. of positives in Protection zone: 61

No. of positives in Surveillance zone: 10

Percentage of deaths to positives compared with previous years : 15% case fatality rate in this outbreak compared with 88% case fatality rate in the Mamre outbreak in 2011, which was the same serotype.

Ratio of positives in clinical cases to subclinical cases : 1.38 : 1

THE SA HORSE EXPORT WORKSHOP UNPACKED

Further to the recent press release (included in Issue 4 of this Newsletter) pertaining to the Strategic Plan to achieve easier horse exports, here we unpack the discussions and presentations which formed part of the workshop, and assisted the Working Group in formulating their strategy. The primary objective of the workshop was to provide a clear path forward for South African horse exports and, by association, the basis to host international equestrian competition, e.g. the Olympic Games.

Only then can the equestrian sector achieve its full potential and thus contribute towards the NDP and the attendees, arguably a gathering of some of the best veterinary, scientific and regulatory brains in the world were tasked with finding solutions to unblock the current impasse.

Some cold, hard facts as presented by Peter Gibson, CEO Racing South Africa

- The South African Government launched the NATIONAL DEVELOPMENT PLAN in 2013
- The overarching objective was to achieve a BETTER LIFE FOR ALL
- More specifically to achieve higher, more inclusive, JOB INTENSIVE GROWTH
- A key driver was EXPORT GROWTH of 6% per annum
- However, a recent WORLD BANK study showed that South Africa's real export growth since 2005 was 0.6%, significantly lower than its BRIC counterparts.
- In line with this trend, HORSE EXPORTS from South Africa account for less than a quarter of one percent of the global horse export market worth an estimated US\$4 billion per annum

Difficulties facing the Racing Industry and Sport Horse Industry due to AHS and resultant Quarantine

The President of Dressage SA, Ms Sue Horne and Endurance representative, Dr Henk Basson, explained the obstacles to South African riders being able to compete on the international stage, following which renowned racehorse owner, Mr Mike de Kock gave a presentation of the difficulties facing the racing industry. The main issues raised were :



- Physiological impact of horses being in quarantine and getting back into work afterwards;
- Cost of transporting horses, stabling, add on costs such as grooms/carers – flights, accommodation etc;
- Marketability of SA horses – buyers don't want to pay so much and have to wait so long. Investment in SA horses has subsequently reduced dramatically. Resolving the export issue could result in a massive boost to the economy, and vastly increased job creation (labour in the racing industry has reduced from 100 000 to 15 000 as a result of the obstacles facing SA for exporting horses).
- A fool proof solution is required, that will be satisfactory to the OIE, EU and all potential importing countries.

The Role of the Central Competent Veterinary Authority in Import/Export Protocol Development – presented by Dr Mpho Maja, Department of Agriculture, Forestry and Fisheries (DAFF).

Dr Maja explained the role of the Central Veterinary Authority, and the importance of this authority to be independent, transparent and objective to ensure it passes any risk analysis conducted by the OIE or Trading Partners. A risk analysis will look at structures, resources, credibility of certification, disease control and the disease situation in the country. Currently the SA Veterinary Services are of an acceptable standard.

The OIE is the 'go-to' organisation for finding out about disease status in member countries. It is recognised by the World Trade Organisation as the standard setting body for member countries. The veterinary authority have an obligation to provide disease information to both Trading Partners and the OIE – to not do this transparently, or to be biased towards industry, could well affect the risk analysis of the country's disease situation.

South Africa currently experiences problems with both inward and outward movement – with outward presenting the most frustrations. SA needs to develop a fool proof export protocol and thereby provide trading partners with assurance that SA won't export AHS.

If there are trade issues, which there are, the industry would be well advised to put an economic case to the Department of Trade and Industry (DTI) – it is the job of the DTI to resolve trade issues, for which the Veterinary Service are unable to help or project industry.

The Development of the OIE Code for AHS – Professor Jim MacLachlan (California, USA)

Prof Jim MacLachlan is based at the University of California, where his research focus is trans-boundary viral diseases of livestock. He serves regularly as an expert advisor to numerous organizations including the World Organization for Animal Health (O.I.E), the United States Departments of Agriculture and Homeland Security, and the European Union and attended the SA Horse Export Workshop to facilitate constructive dialogue for the way forward to assist in the export of SA horses.

Prof MacLachlan reiterated that science is critical to the process going forward, and any changes in the OIE demands that trade has to be based on scientific criteria that is transparent. The goal of the OIE is to provide a transparent repository of disease information which they can pass on to trading countries. There are two important publications that the OIE produces, the Animal Health Code which sets the rules for rules-based trade, and the OIE Manual, which prescribes tests, vaccines to guide and facilitate regulation.



It is important to note, as was emphasized by Dr Maja of DAFF, the OIE is not regulatory body to that makes decisions about who is right and who is wrong – this is the role of the WTO. The OIE provides resources in terms of disease status, the Animal Health Codes to guide safe trading, and the OIE Manual indicating which tests are most appropriate. However, when it comes to trade, that is a bilateral agreement between countries that want to trade. The OIE workgroups are science based and do not enter into the politics of the matter. Science and politics must be kept separate.

African horse sickness is a listed OIE disease in that it has the ability to cause great social impact and can be transmitted – it therefore needs to be regulated. Prof MacLachlan explained the similarities in the challenges facing AHS and Bluetongue, with which the bulk of his experience lies. The Bluetongue situation took a massive international scientific effort to change the OIE Code, which was changed once international consensus had been reached. Since Bluetongue the OIE has stressed the importance of surveillance.

Issues facing SA with regards to AHS

- There is a problem with the protection zone as prescribed;
- Current SA AHS vaccine not acceptable for Northern Europe, and it is unlikely that any country will accept a live attenuated vaccine that could be spread by vector midges. Upscaling the current vaccine will take a minimum of eight months, and producing a new vaccine take a minimum of 2 years.
- All of trade is based on diagnostics – the consequences of a false positive are enormous. Therefore tests must be validated by global trials.

Positives

- The three areas of Surveillance, Vaccine and Diagnostics are all specific areas that SA can prioritise and investigate.
- Only SA can do this investigation, and is in the unique position of having the capacity to look at current field strains that are circulating.

Exports from South Africa since 1997 – Professor Alan Guthrie

Prof Guthrie summarized the history of horse exports from South Africa.

Export

- Prior to 1960's, SA could export horses all over the world – no quarantine.
- 1958-1962 – An AHS outbreak in the Middle East and SW Asia, resulting in the first OIE code for AHS with restrictions on importation of horses from AHS countries being imposed. This stopped horses moving from SA except to the USA.

USA Imports

- In the 1960's a New York Animal Import Centre was built in Newburg.
- 60 day post arrival quarantine in vector protected facility if coming from AHS infected country. Applies to all African countries except Morocco, Saudi Arabia, Yemen and Oman.
- 1960's to 1997 this was SA's only export route for SA horses, during which time combi freighter aircraft were used. This route has not been used since 1999, as there are no longer combi freighter aircraft flying, and dedicated charters are now required at great expense.

AHS in Europe 1987-1990

- Outbreak in Spain in 1987 due to import of zebras from Namibia.
- Spread to Portugal and Morocco.



- Presented a major problem as the 1992 Olympic Games were scheduled to take place in Barcelona. Thus the introduction of the OIE 'regionalisation' for AHS.

1991 OIE AHS Code

The 1991 OIE AHS Code allowed an AHS Free Zone separated from AHS infected area by :

- A surveillance zone of radius at least 50km
- A protection zone of radius of at least 100km
- Should be a substantial geographic or political borders between zones.

Import from AHS Infected Zone / Counter were allowed with the following :

- Imports only during "vector safe" time of the year
- "Vector proof" quarantine – 40 days. This presented problems for competition horses traveling for an event.

Export Strategy Meeting 1995

This meeting resulted in the Commission decision being accepted in January 1997 allowing direct import of horses from AHS free area of SA into EU. Protocols were accepted by Hong Kong, Malaysia, Singapore, and United Arab Emirates. The first SA exports took place in 1997 (London News, Trojan Hero, Ruby Mountain). Again, the discontinuation of combo aircraft following Helderberg disaster, created a major game changer.

Outbreaks in Controlled Area

- 1999 – Stellenbosch – Strain 7, 31 deaths = suspended March 1999 to June 2001
- 2004 – Stellenbosch – Strain 1, 16 deaths
- 2006 – Robertson – Strain 5, 12 deaths = suspended January 2004 to October 2006.

Developments since 2006

- Revision of OIE's AHS Code, which was adopted in May 2008;
- Allowed imports from AHS infected countries or zones all year round from vector protected quarantine, with testing.
- Also first code chapter that introduced AHS Surveillance Guidelines.

Mamre Outbreak – 2011

Mamre is not a traditional horse area with very few stables available, making interventions much more difficult to manage. Nevertheless a great deal of information was gleaned from this outbreak and from a scientific perspective valuable knowledge gained.

Developments since 2011

- SA's application for AHS free zone not successful
- SA request to UAE to import horses from an "AHS infected country" – no progress on this.
- EU FVO Inspection – some issues still to be dealt with
- Melkbos "incident" – 2013 – complicated re-declaring area free
- Porterville, Wellington outbreak – 2014 (since presentation, extended to Robertson and Tulbach)

Today's Issues

- New OIE Code
 - Official AHS Freedom
 - Import from AHS infected zone all year
 - PCR – PEQ to 14 days
- Changing EU legislation?
- Perceived threat of AHS has increased drastically
- Different political environment



A view from the other side of the fence – Dr Koos van den Berg (Singapore)

Dr van den Berg is a South African veterinarian currently based in Singapore as the Head of the Singapore Turf Club Veterinary Department, a position he has held since 2007. Of the approximately 1800 horses in Singapore, 1400 of these are situated at the Singapore Turf Club, where around 99 races are run annually, with international participation in races held during the international weeks. This generates considerable income, a model that requires protection.

There have been a number of high profile SA horses going through the Turf Club, and these horses have a good reputation – there is a keen interest in SA horses. However, the post arrival quarantine station is just 5km from the race track. There is therefore zero margin for error with bringing in a horse from an AHS country/zone, as it has the potential of destroying the local industry due to the close proximity of the station to the race track.

Imports of South African horses has decreased significantly, with zero imports from SA since 2012, owing to the lengthy quarantine requirements. Currently horses moving from SA to Singapore is via Mauritius (3 months) and the UK (3 months) – a total of 6 months in quarantine. A solution needs to be found to alleviate this period.

The Agri Food and Veterinary (AVA) authority's main task is to protect food supply, and they also deal with outbreaks of people diseases such as Nipah, SARS and avian influenza. During the outbreak of SARS, all race meetings were discouraged and there was no international horseracing.

There has been considerable progress in setting up laboratories in Singapore, and at a recent OIE workshop veterinarians were encouraged to think along the lines of horse movement. The time is right now to push forward with new possibilities.

WORKGROUPS

Workgroup Session 1 : Export Protocols

Delegates were broken into four workgroups addressing the following topics pertaining to exports :

- Group 1 : Exporting from a free zone / EU protocol
- Group 2 : Exporting from an infected zone
- Group 3 : Exporting to the USA
- Group 4 : Exporting via a third country

Following feedback from the above workgroups, the delegates were split again into four groups.

Workgroup Session 2 : Surveillance, Vaccination and Movement Control

- Group 1 : Role of vaccination in AHS control
- Group 2 : Disease surveillance in the AHS infected area
- Group 3 : Disease surveillance in the AHS controlled area
- Group 4 : Movement Control

The feedback from these sessions were used to assist the Strategy Group to establish the Strategy published in the April Issue of this Newsletter.



Exports : A South African Perspective (Mr Robin Bruss)

Objectives of Export Trade :

- Foreign Currency Inflow
- Sustainability of Business
- Creation of Jobs
- A healthy industry.

Components

- Export Sales
- Horses exported for Competition Purposes
- Shuttle Stallions concept (potential advancement to the gene pool)
- Horses brought into South Africa for competition to be re-exported (Olympics 2024)

Current Thoroughbred Industry – An industry in decline

There has been a reduction in number of breeders, stallions and mares, with a consequent reduction in labour.

Exports

Racing SA estimates that the current value of all horse exports R250 million per annum, representing 0.25% of the global trade in bloodstock. Yet out of 60 countries that race horses, SA ranks 7th largest in terms of number of runners, 10th in terms of number of races, but in terms of average earning per horse, SA only ranks 19th.

Competition horses abroad

Prize stakes overseas far exceed those in South Africa – compare the R3,5 million at the Vodacom Durban July with the US\$10 million (R100 million) Dubai World Cup, which paid more in one meeting than the entire prize money for 12 months in SA for 3833 races. Mike de Kock has achieved significant success with SA horses abroad, in spite of the difficulties in getting the horses there.

Current Export Routes

- Free Zone ex Cape Town concept since 1997, with the drawback being the intermittent 2 year suspensions following outbreaks;
- Mauritius is the back up of necessity, but issues prevail requiring full evaluation;
- USA option available since 1959, but non availability of combo aircraft hinders this option;
- Potential lock-down from infected area, but not accepted by any country at this stage.

Problems and Solutions

Each option has macro and micro issues, and none is a perfect strategy. It is clear that 'out-of-the-box' thinking is required, a new strategy needs to be determined, for which feasibility and funding will be required. Political will and collaboration is vital, with commitment of all parties being paramount.

Websites and Social Media

Professor James Gilkerson is the Professor of Veterinary Microbiology at the University of Melbourne, Australia, as well as being the Director, Equine Infectious Disease Laboratory and Centre for Equine Virology. He spoke on the dangers of incorrect reporting on social media and websites. We have entered the digital age where the internet is the first source of information, with both the Advantages and Disadvantages being :

- Fast source of information
- Real time reporting
- Easily updated
- Mass communication
- Mobile communication



The reason these are also disadvantages, is that if the information published is incorrect, this can result in a serious knock-on effect in the industry, by creating hysteria and misinterpretations of the facts. Prof Gilkerson gave examples of mis-reporting in Australia. Websites are very effective tools, but must be used responsibly.

Tamsyn de Beer, and attorney who works in association with the 'Social Media Legal fundi', Emma Sadleir, gave a presentation on the legal implications of social media posts. The downfall of social media is that posts lack tone, context and control of the reader is lost. The closed group, which are by invitation only are aimed at supporting horse owners, but can easily be misused, and the consequences are exactly the same whether closed groups or not.

It is preferable to show constraint and spread the word to neighbours without going as public as Facebook. Social media reports often result in people not wanting to report incidents of AHS, or of people rather moving their horses illegally, thus hampering movement controls and the control of the disease.

Note : Dr Evan Sergeant is currently compiling a full report on the SA Horse Export Workshop and this will be posted on the ERC Website (www.up.ac.za/ERC) on receipt thereof.

SUMMARISED PUBLICATIONS

RESPONSE OF FOALS TO POLYVALENT VS MONOVALENT AHS VACCINES

African horse sickness (AHS) is a highly fatal disease in susceptible horses and vaccination is currently used to prevent the occurrence of the disease in endemic areas. Similarly, vaccination has been central to the control of incursions of AHS Virus (AHSV) into previously unaffected areas and will play a significant role in any future incursions.

Several AHSV vaccines have been previously developed and used including a polyvalent live-attenuated (modified-live virus – MLV) vaccine. Although new generation vaccines have been described recently, only MLV AHSV vaccines are currently commercially available in southern Africa, Senegal and Ethiopia.

The vaccine currently used in southern Africa was first introduced in the 1960's and has since undergone significant modifications. AHSV-9 is not included in the vaccine and serotype 5 was removed from the original vaccine due to severe adverse reactions in some immunised horses. However, cross-protection between AHSV serotypes 5 and 8, as well as between serotypes 6 and 9 has been reported. The MLV vaccine currently used in southern Africa includes a cocktail of serotypes 1, 3, 4 (bottle 1) and 2, 6-8 (bottle 2) delivered in two separate doses at least 21 days apart.

The purpose of this study was to do a comparison between the currently used polyvalent (more than one serotype) vaccine versus a monovalent (one serotype at a time) vaccine administered to naïve foals. Findings from the study are relevant to the control of AHS in endemic areas, as well as regions and countries at risk of future incursions.

The study was conducted using 46 foals aged between 7 and 10 months, split randomly into three groups. All these foals were resident on a commercial stud farm near Wellington in the Western Cape, an area that is subject to an active AHSV surveillance programme. No cases had been detected within a radius of 30km of the farm since the



inception of the surveillance programme in 1996. All the foals were given the same routine veterinary care, and ethical approval was granted by the Animal Use and Care Committee of the University of Pretoria.

The three groups (Group I-III) were immunised at specific intervals with either polyvalent or monovalent (AHSV 1, 4, 7, 8) MLV AHS vaccines. Foals in Group I were vaccinated with the commercially available polyvalent MLV AHSV vaccine, given as two doses 28 days apart. Foals in Group II were initially vaccinated with monovalent MLV AHSV serotype 1 followed by monovalent MLV AHSV serotype 8, 28 days later. Similarly foals in Group III were vaccinated at a 28 day interval, initially with monovalent MLV AHSV serotype 4 and 28 days later with serotype 7.

The serotype-specific responses of foals given the monovalent MLV vaccines were similar to those of foals given the polyvalent MLV preparation, suggesting that there is no obvious enhanced immune response through the administration of a monovalent vaccine as opposed to the polyvalent vaccine.

These studies were funded by Racing South Africa, The Thoroughbred Racing Trust and the Equine Research Centre, University of Pretoria.

Publication : Vaccine 2014 - Serological response of foals to polyvalent and monovalent live-attenuated African horse sickness virus vaccines.

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ARTIFICIAL REPRODUCTION IMPACTS ON THE CONTROL OF CONTAGIOUS EQUINE METRITIS (CEM)

Having first made its appearance in the Thoroughbred mare population in the United Kingdom in 1977, the origin of this extremely contagious sexually-transmitted disease was suspected to be via introduction of mares from Ireland, following an earlier shipment of mares from France to Ireland. The cause of the disease was later established to be a bacteria which were named *Taylorella equigenitalis*. The disease is characterised by shortened inter-oestrus intervals and poor pregnancy rates associated with a pus discharge from the mare's external genitalia, and was termed 'contagious equine metritis' (CEM).

CEM has been reported from at least 30 countries in Europe, North and South America, as well as in Japan, Australia and South Africa, where it raised its ugly head affecting the Lipizzaner stallions a few years ago. It is recognised as a true venereal disease associated with the introduction of *T. equigenitalis* during natural breeding by carrier stallions or via artificial breeding with contaminated semen obtained from carrier stallions. This results in inflammation of the lining of the uterus in the mare, causing vulvar discharge and an irregular return to oestrus as a consequence of failing to conceive, or early embryonic death. The effects on breeding has resulted in an adverse effect on the economy, with regulatory restrictions associated with CEM now limiting movement and trade of horses.



More recently there is a trend associating CEM with artificial breeding, which is in contrast with previous outbreaks which primarily affected Thoroughbred breeding. Artificial Insemination (AI) has greatly increased the risks of spreading this disease which can be transmitted by an inanimate object such as a towel or brush. Semen can be collected from a stallion which is not known to be a carrier, and thus spread the disease to whichever country it is shipped. When one considers the role of the breeding centres, where large numbers of stallions are transferred for semen collection facilitating direct and indirect contact between stallions, some of which may be carrying the disease, and the subsequent return of the stallions to their farms, it becomes obvious how easily the disease can spread, and how important it is for stricter controls to be put in place. Stallions are not actually infected, as the organism only positions itself on the external genitalia. Affected stallions are the main source of infection and their carrier status can last for months, or even years, during which time they may potentially contaminate numerous mares.

While the disease has been brought under control for Thoroughbreds subsequent to 40 years of international regulation and disease surveillance, focus must now be placed on the control of artificial breeding in non-Thoroughbred horses.

In terms of diagnosis and management of the disease, the current protocol for testing is by traditional bacteriology using swabs on the external genitalia. This method is limited by inherent factors associated with *T. equigenitalis*, i.e. practicality, costs, prolonged turn-around time and false negatives. However, a variety of discriminatory real time PCR tests for rapid, sensitive and specific detection of *T. equigenitalis*, have shown that PCR addresses most of the short-comings of bacteriology with fewer false negatives, even in adverse conditions. It is more practical, has quicker turnaround times, and lower costs, presenting a light at the end of the tunnel in terms of the diagnosis and control of this disease.

Future areas that warrant investigation include defining the direct effects of CEM on reproductive performance and the economics of artificial breeding with the aim of creating an awareness of any potential significance to artificial breeding populations. There appears to be a greater understanding of the roles of unapparent carriers and chilled semen, however the transmission risks associated with cryopreserved semen and embryos remains a minefield.

The international validation and acceptance of a robust PCR test will have significant benefits for future disease surveillance, diagnostics and international trade and movement of horses.

Publication : *Veterinary Microbiology* 167 (2013) 2-8 : *Contagious equine metritis : Artificial reproduction changes the epidemiologic paradigm*
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