

WITS HEALTH CONSORTIUM  
EQUINE HEALTH FUND

Prospectus

2014/5





“The equine industries of racing, sports horses and endurance require a consistent investment in the health of horses to stabilize the industry and address the environmental exposure to infectious diseases in particular. Africa has always been a difficult environment for horses with ongoing major diseases such as biliary, African horses sickness and the threat of an outbreak of Equine Influenza.

**Throughout the world investment in Equine Health is considered an imperative for industry survival.**

With globalization the transport of infections across borders has become a risk to the continued health of our industry. With this in mind we are calling on all horse industries to contribute significantly to the establishment and maintenance of the existing expertise at the University of Pretoria, Onderstepoort Veterinary Institute, and in the private sector to secure our future. We are equally committed to leverage your support with Government funding and support to enable growth of the industry.”

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*"I am enormously encouraged by the start-up of the Equine Health Fund and a new era for equine research in South Africa. There are an estimated 330,000 horses in the country so it really is important to have a national body that can apply itself to the specific conditions of South Africa. For thoroughbreds, equine research will be beneficial to assist breeders, trainers and owners in improved health, disease control, treatment, fertility, foal care and race performance. It will also be a key support factor to government's efforts to open up trading protocols to give South Africa access to the global market worth an estimated R1bn per annum and allow our horses to continue their successes on the world stage. The Thoroughbred Breeders Association has always played a key role in funding equine research and are firmly behind the EHF, and will be donating funds collected from breeders as well as a significant amount raised from its auction activities."*

**Susan Rowett – Chairman, Thoroughbred Breeders Association**



# WITS HEALTH CONSORTIUM t/a EQUINE HEALTH FUND (EHF)

## 1 INTRODUCTION / BACKGROUND

South Africa has come out of the period of isolation to participate in the globalization of trade, and with an innovative approach has rapidly begun participating in more high-technology, biotech and development industries to address public and veterinary health challenges facing Africa as a region.



The Equine Sports of racing, endurance, equestrian and other sports have demonstrated exceptional competitiveness internationally. In recent years these sports industries have reduced in size due to economic conditions, difficulty accessing global markets, and in part due to infectious diseases hampering conditions for production, export and trade.

The infectious diseases including African horse sickness, Equine Herpes virus and Equine Influenza have also been recognized as a major threat to the economic viability of the industry, as major outbreaks have the potential to cripple the industry with losses, movement controls, cancelled events and export bans.

**Throughout the world, investment in Equine Health is considered an imperative for industry survival.**

The Horse Racing Industry has for 24 years supported the development of the Equine Research Centre, Faculty of Veterinary Science, University of Pretoria, with significant success. The major industry role players have in the last 9 years contributed their funding through Horse Racing South Africa (Pty) Ltd, to support equine research and the export of horses. The industry organisations which have traditionally supported the development include:

1. Thoroughbred Breeders Association
2. Phumelela (Pty) Ltd
3. Gold Circle
4. Racing Association
5. Thoroughbred Racing Trust
6. A number of private donors have supported projects over the last 5 years.

Key to the success of the private funding support for surveillance, research development and vaccine development is an understanding of the environment and the role players:

1. Department of Agriculture Forestry and Fisheries
2. Department of Science and Technology for funding opportunities
3. Department of Trade and Industry
4. Department of Sport and Recreation ahead of an Olympic bid
5. University of Pretoria
6. Private sector biotechnology companies.

From the 1<sup>st</sup> of August 2014, the mechanism of joint funding has come to an end, with agreement of the existing partners to continue the programme of equine health research, monitoring evaluation and activities through the Wits Health Consortium (Pty) Ltd, Equine Health Fund (EHF).

## 1.1 APPLICATION FOR OFFICIAL RECOGNITION OF AHS STATUS BY THE WORLD ORGANISATION FOR ANIMAL HEALTH (OIE)

In order to prevent the spread of devastating and trade sensitive diseases, the OIE established animal health standards to guide countries. (OIE Terrestrial Animal Health Code-diseases have code chapters thus we refer to the AHS OIE code.) The main objective of the OIE Terrestrial code is to facilitate safe trade in animals and animal products and to prevent unjustified trade barriers.

The OIE realized that member countries that have invested in costly control measures, should benefit by official recognition of negative disease status. In 1995, Foot and Mouth Disease (FMD) became the first disease for which the OIE developed scientific based standards for official recognition of negative status. Rinderpest was added in 2000, contagious bovine pleuropneumonia (CBPP) in 2003, bovine spongiform encephalopathy (BSE) in 2004 and African horse sickness (AHS) in 2012.

Member countries are not allowed to self -declare freedom from the above diseases – but follow a process of applying for official recognition by the OIE for “disease free status”.

For application to the OIE the disease specific questionnaire and format has to be followed. (For AHS refer- OIE Code Chapter 1.6. Article 1.6.6 bis.)



*Mamre 2011 Outbreak of AHS*



*Porterville 2014 Outbreak of AHS*

The South African application to the OIE for recognition of an OIE “AHS Free- Zone” in the Western Cape (WC) was submitted in November 2012. This application was not accepted due to the following concerns:

a. The size of the WC zone (approx. 20km around Cape Town) was considered too small as the code requires surveillance 100 km in from the border with the infected area, unless natural barriers can reduce this distance. It was proposed **by the OIE** that the free zone plus current surveillance zone become a new free zone. In addition, the proposed surveillance strategy would have to be revised to comply with Articles 12.1.13 - 12.1.15 of the Terrestrial Code.

b. 24 months should elapse after cessation of the last outbreak before an application will be considered. Compliance with this requirement has been difficult for South Africa following the 2011 Mamre and 2014 Porterville outbreaks of AHS in the surveillance zone.

c. Protection measures for movement between the infected and intended free zones need to comply with OIE principles.

## 1.2 APPLICATION FOR EXPORT TO THE EUROPEAN UNION

An alternative approach to the OIE application was explored with a direct application for resumption of trade with the EU, and an FVO audit inspection was undertaken in May 2013 following the mandatory ban on exports for 2 years after the 2011 Mamre outbreak of AHS. The inspection had the following main findings:

- a. South Africa presented insufficient surveillance data for the Western Cape Free-Zone and Surveillance Zone to prove absence of AHSV after the outbreak, and to comply with routine surveillance requirements for AHS and Dourine. In addition vector surveillance inside and outside the quarantine facility should support a claim of vector protection.
- b. There was inadequate control of movements and inadequate auditable documentary proof of all movements in South Africa and especially into/out of the "Free-Zone". In addition the EU audit questioned the legal authority of the National Department of Agriculture Forestry and Fisheries (DAFF) to enforce movement control under the Provincial Constitution of South Africa.
- c. The organisation and capacity of the laboratory network needs review in order to ensure consistent and reliable diagnostic capacity, certification by DAFF of the diagnostic procedures and to validate the tests used.
- d. The organisation and capacity of the competent veterinary authority and their ability to maintain the requirements of surveillance, movement control and international reporting was questioned.

*"Journalists the world over now refer to the success of South African horses abroad as "racing's worst kept secret". For all South Africa's international successes over the years, the victories of the last 12 months equal anything we've achieved before, an emphatic announcement that our horses are up there with the best in the world. That 27% of the turnover at last November's Ready To Run sale was generated from abroad, is the best indication of the appeal of the South African racehorse, and with our currency as "light" as it is, there has never been a more favourable prospect for international trade. This is South Africa's time, and we must seize it while the opportunity serves."* **Mick Goss – Top Horse Breeder, Summerhill Stud**



### 1.3 OUTLINE OF THE FUTURE STRATEGY

To address all of the above constraints we propose a well -coordinated response to AHS. The key features of the approach are reliant on good science to support trade negotiations, high-level political support, and industry funding. This is an interdigitated but well controlled budget with activities between the Equine Health Fund Core, Equine Research Centre, and selected external parties.

**The total budget required to meet the objectives of the strategic plan is R15 965 454 in year one.\***

It is anticipated that a total funding commitment of R93 Million over five years is required to meet the objective to stabilize and enhance the future of equine health in South Africa. This figure includes estimates for Phase III vaccine development for serotypes not included in the current AHS vaccine as well as the projects listed under 5.4 and 5.5 at the end of this document.

A list of the components are proposed below:

- a. The **Equine Health Fund** as the coordination body to raise funding; provide trade and regulatory and documentation support to the Department of Agriculture, Forestry and Fisheries (DAFF); evaluate and prioritize research proposals and undertake financial management and human resources. The proposed EHF will include an advisory panel of international experts to evaluate the proposed research agenda, and review annual reports.

**Total estimated budget in year one: R 2 717 125**

- b. **Surveillance and disease reporting**

An epidemiology unit to maintain an accurate census, coordinate and operate AHS surveillance, monitor movement control in the "AHS Controlled Area", including some policing activities and prepare surveillance reports for trading partners and OIE dossiers.

**Total estimated budget in year one: R 1 372 230**

- c. **Data management and the development of a database system**

A high priority development is a single identification system for horses in South Africa, linked movement control, disease surveillance and reporting. One of the major problems highlighted during the FVO audit was the need for an integrated database to facilitate easy input of data that will co-ordinate all data sources and can be used to monitor progress and generate reports required by trading partners.

**For export and an Olympic bid the surveillance data is critical.** The Ostrich, Pig, Horse and Wildlife (particularly buffalo) industries have taken on increasing responsibility for surveillance data and management. The DAFF representatives met with the Equine Industry representatives to discuss the development of a web -based central database that supports horse identification, surveillance, movement control and disease reporting and the possibility of related revenue systems.

\* This excludes vaccine development as listed under 1.3(f) and the projects included in the table at the end of the document after 5.5

AusVet is currently consulting with the DAFF and the Equine Industry to adapt the proprietary data system developed by the company and successfully implemented in Indonesia for surveillance, disease reporting and animal disease control (low income country with 300 islands). Implementation of the system is based on internet and mobile SMS communication accessibility.

This system will initiate in the Western Cape AHS Controlled Area and the programme implementation will be undertaken in consultation with the DAFF, Western Cape Veterinary Services, the Animal Health Forum, and Government Communications and Information Systems.

The budget proposed here follows initial discussions, the cost rate at R4.0M is anticipated for the first 2 years, with routine implementation decreasing in years 3 to 5. An offset revenue model may be feasible on the user-pay principle for movement certification, vaccine records and disease outbreak information dissemination. The website will become the go-to resource for all AHS information in South Africa.

**Total estimated budget in year one: R 4 000 000**

**d. Equine Research Centre Core Funding**

Support for core activities of research, post-graduate training, maintenance of laboratories for infectious diseases testing and outbreak analysis. In addition the ERC will continue to process samples for surveillance, develop diagnostic capabilities and vaccine candidates.

**Total estimated budget in year one: R 4 553 496**

This includes salaries, bursaries, consultants, running costs, DAFF Approval/SANAS Accreditation of the laboratories and maintaining a cohort of horses.

A key success in the funding period for 2013 has been to access additional collaborative funding from the Department of Science and Technology, and increased institutional support from the University of Pretoria totaling approx. R3 000 000 per year (2014 – 2016). The details of the collaborative funding include: (1) University of Pretoria 50% funding of the Directors Salary, (2) THRIP project (Technology and Human Resources for Industry Programme) (2014-2017), (3) revenue from commercial testing (Samples for Export, Import, Movement, Contagious Equine Metritis [CEM] screening).

**e. Specific project funding**

The key projects have been reviewed by the Scientific Advisory Board and priority has been set for the following areas of research:

- AHS Diagnostics including ongoing development of the RT-qPCR on the current platform and alternate diagnostic systems, and competitive ELISA testing. This is anticipated to be an ongoing programme of research and development to meet the international requirements and to take advantage of improving technologies.
- Transmission of AHS vaccine (Co-Funded by THRIP) currently underway and anticipated to provide informative results within one year.



- Differentiate field virus and vaccine virus (genotype sequencing) – this continues the work initiated following the Porterville Outbreak in 2014.
- Testing of surveillance samples: (Infected area = Epidemiology of AHS) continues throughout the programme.
- Testing of surveillance samples (Western Cape) continues throughout the programme.
- Testing of outbreak samples (Western Cape) continues throughout the programme
- National Horse Racing Authority pharmacology and physiology studies as directed by the NHA to address performance enhancing drugs.
- Vector research including a. protection of jet stalls b. vector distribution around and inside the quarantine facility and in an alternate control zone such as the Northern Cape.

The Scientific Advisory Board will give input on the relevance and progress of projects.

**Total estimated budget for projects in year one: R3 322 602**

#### f. **AHS Vaccine development**

The AHS vaccine development is listed separately from the above projects. There are two potential South African candidate vaccines currently in phase II development. During this phase of development challenge tests are performed on a relatively small sample size, ranging between 12-16 horses.

The challenge tests expose vaccinated and unvaccinated horses to an intravenous dose of known AHS subtype. These are proof of concept studies each costing between R800 000 and R1 200 000 per study.

Funding support will depend on the feasibility, scientific rigor and applicability to the South African setting. Rigorous review by the Scientific Advisory Board is anticipated ahead of releasing the required funding. The most suitable vaccine will be taken into phase III studies in 2016/7 with a sample size of approx. 400 horses, most likely as an additional vaccine to the current standard vaccination to cover for those serotypes not currently in the vaccine.

The phase III study is anticipated to cost around R10-12Million. A successful development will have a product that can be registered in 4-5 years.

**Total estimated budget for vaccine development year one R1 800 000 rising to R10 000 000 in year three.**



*"South African race horses have proven that they are competitive on the world stage The long term financial viability and health of the South African horse racing industry depends on access to the world market. Every well planned and executed effort to unlock the door to the global market for our breeders and owners, must be supported."*

**Chris van Niekerk, CEO of Cape Thoroughbred Sales**

## 1.4 SUMMARY BUDGET TABLES

<b>Summary EHF</b>			
	<b>2014/2015</b>	<b>1 August 2015 - 31 July 2016</b>	<b>1 August 2016 - 31 July 2017</b>
EHF Core Budget	R 2 067 525	R 2 170 800	R 2 301 048
EHF Scientific Advisory Board	R 649 600	R 688 576	R 729 890
<b>Total Core + Scientific Advisory Board</b>	<b>R 2 717 125</b>	<b>R 2 859 376</b>	<b>R 3 030 939</b>
EHF Project: Surveillance Sentinels	R 681 564	R 722 458	R 765 806
EHF Project: Surveillance Quarantine	R 121 072	R 128 336	R 136 036
EHF Project: Surveillance Carthorse	R 189 874	R 201 266	R 213 342
EHF Project: Surveillance Wildlife	R 56 000	R 59 360	R 62 921
EHF Project: Census and Movement Control	R 323 720	R 343 143	R 363 731
<b>Total Surveillance and Movement Control</b>	<b>R 1 372 230</b>	<b>R 1 454 564</b>	<b>R 1 541 838</b>
<b>EHF Project: Database</b>	<b>R 4 000 000</b>	<b>R 4 240 000</b>	<b>R 2 000 000</b>
<b>Total:</b>	<b>R 8 089 356</b>	<b>R 8 553 941</b>	<b>R 6 572 777</b>

<b>Summary ERC</b>			
	<b>1 August 2014- 31 July 2015</b>	<b>1 August 2015- 31 July 2016</b>	<b>1 August 2016- 31 July 2017</b>
<b>Equine Research Centre Core Funding</b>	R 4 553 496	R 4 826 705	R 5 116 308
<b>Surveillance ( sample processing)</b>	R 1 915 950	R 2 030 907	R 2 152 761
<b>AHS Vaccine Transmission</b>	R 633 862	R 671 893	R 0
<b>Field vs Vaccine Virus ID</b>	R 500 000	R 530 000	R 561 800
<b>Vector Protection of Jetstalls</b>	R 152 790	R 161 957	R 0
<b>NHA Drug Administration Trials</b>	R 120 000	R 127 200	R 134 832
<b>Total:</b>	<b>R 7 876 098</b>	<b>R 8 348 664</b>	<b>R 7 965 702</b>

*“Failure to support and fund the current export initiative will be suicide for our export market. South African horses are very competitive on the world stage. Our results speak for themselves. Our horses are in demand but we have difficulty with delivery which is hurting this industry financially .With efficient export we could create thousands of jobs and bring in massive foreign investment. ”*

**Mike de Kock - Top Racehorse Trainer**



## 2 OBJECTIVES OF EQUINE RESEARCH

The Equine Health Fund seeks to secure long-term funding commitments from industry role players and individual donors to stabilize and grow the output and impact of the biomedical research initiatives. The vision of the Equine Health Fund is to set funding goals, independently evaluate the research strategy, projects and proposals presented by the researchers, AND implement the grants management of funding received from multiple sources to ensure compliance and performance management of recipients. This approach places the funding agency into the driving seat, assisting to rationalize the proposals, adjudicate the methodological approach, and monitor performance of the grant recipients.

**In the first 1-3 years the following key objectives have been set:**

1. To address key infectious diseases with a major impact on the ability to export horses and grow the industry.
2. To address key equine reproductive health questions which have an impact on the performance of the horse breeding industry.
3. To support research in performance enhancing drugs, and exercise physiology.
4. To develop a framework of post-graduate training and research activity in horses for the capacity development of veterinary and laboratory personnel, to secure the future of the industry.

## 3 SPECIFIC AIMS – Equine Health Fund

### 3.1 SPECIFIC AIMS FOR DAFF LIAISON

- a. Regular communication with the Department of Agriculture, Forestry and Fisheries ( DAFF)
- b. Develop documentation for and on behalf of the DAFF
- c. Regulatory processes for OIE, EU and other trade partners
- d. Establishing and leading the horse import-export task team ( HIETT)
- e. Veterinary Liaison between industry and the DAFF

### 3.2 SPECIFIC AIMS IN INFECTIOUS DISEASES

- a. To develop an epidemiology group in support of DAFF to meet surveillance, movement control and reporting requirements.
- b. To support DAFF to meet disease investigation, containment and where applicable, eradication requirements.
- c. To develop a database system to support collection, integration and analysis of data to comply with international surveillance and reporting requirements. This will be started by the industry for AHS with the aim of developing a partnership with the DAFF for roll out to a national database system.
- d. To develop diagnostic platforms in support of disease diagnosis, cost-efficient surveillance, and immunologic end-points of vaccine trials.
- e. To develop vaccines for the major diseases affecting horses.

### 3.3 SPECIFIC AIMS IN REPRODUCTIVE HEALTH

- a. To investigate causes of embryonic loss, abortions and neonatal loss in horses.
- b. To support the development of research in reproductive productivity and general physiology.

### 3.4 SPECIFIC AIMS IN PERFORMANCE ENHANCING DRUGS AND EXERCISE PHYSIOLOGY

To support the research requirements of the National Horseracing Authority (NHA) and the South African Equestrian Federation (SAEF).



*Lasix Study Scoping*



*Lasix Study at the finish*

### 3.5 SPECIFIC AIMS IN HUMAN CAPACITY DEVELOPMENT

To support human capacity development at post-graduate level, focused on the equine industry as a measure to secure the future of the industry. The University of Pretoria is the only Veterinary Faculty in South Africa, and therefore the development of veterinarians, nurses, technicians and laboratory personnel occurs predominantly at this institution. Onderstepoort Veterinary Institute is also a recognized post-graduate training facility.

## 4 WITS HEALTH CONSORTIUM (Pty) Ltd and EQUINE HEALTH FUND

Wits Health Consortium (Pty) Ltd (WHC) is a wholly owned subsidiary of the University of Witwatersrand, established in 2001 to manage research funding in the Faculty of Health Sciences of the University. Prof Ian Sanne has initiated the EHF under Wits Health Consortium due to the deep experience of the organization in grants management for major international agencies such as National Institute for Health, USAID, EU, Bill and Melinda Gates Foundation.

The EHF division of the company has two reporting lines – (1) Legal, Financial, Human Resources and Grants Management report to the WHC; (2) Academic reporting line is to the Head of the Department of Medicine. The key personnel of the EHF are Prof Ian Sanne, the Founding Director; Dr Bev Parker, Veterinarian; and Mrs Nora-Jean Freeman, EHF Coordinator.



***Prof Ian Sanne***

Prof Sanne is an Associate Professor of Internal Medicine and Infectious Diseases, University of the Witwatersrand; and honorary Associate Professor at the Boston University Centre for Global Health & Development. He has a 14 year track record of research conducted in the prevention and treatment of HIV/AIDS with over 160 publications. Prof Sanne has a track record of outstanding managerial skills, with substantial research and implementation grants awarded.



***Dr Beverley Parker***

Dr Beverley Parker is a veterinarian with 20 years regulatory and liaison experience. She works closely with DAFF, serves on the executive of the South African Equine Veterinary Association and is the equine industry representative on the Animal Health Forum.



***Mrs NJ Freeman***

Mrs Nora-Jean Freeman is the EHF Coordinator. Nora-Jean, known as NJ, has been involved in the horse sport industry for several years, having worked as the Marketing and Transformation Officer at the then SA National Equestrian Federation, following which she spent five years at the Gauteng Horse Society as Administration Manager, and subsequently General Manager .

## 5 SUMMARY OF CORE ACTIVITIES AND PROJECT PROPOSALS FOR THE NEXT 1-5 YEARS

### 5.1 EQUINE HEALTH FUND

The international movement of horses is a function of the competent veterinary authority. Success depends on a public-private partnership based on the relationship between the industry, the DAFF and the regional veterinary services.

The Equine Health Fund made up of the founding Director, Prof Ian Sanne; (No salary effort) a veterinarian, Dr Bev Parker (100%), and an EHF Co-ordinator, Mrs N-J Freeman (100%) will build and foster this relationship through regular liaison and regulatory support.

The Equine Health Fund will determine research priorities, evaluate project proposals, implement grants management, evaluate project timelines, report on progress and provide fund accountability. The research strategy will be evaluated independently by a Scientific Advisory Board made up of independent scientists of relevant international standing.

The personnel and expenses for the core activities of the Equine Health Fund will be managed by the Wits Health Consortium.

### 5.2 MONITORING, SURVEILLANCE AND MOVEMENT CONTROL



Ongoing funding is required to meet government requirements for disease monitoring, surveillance and movement control. This will be done through the establishment of an epidemiology unit, based in the Western Cape.

The unit will be responsible for a private –public surveillance and a movement control system that will meet OIE and EU requirements. The surveillance system will concentrate on African horse sickness but will be expanded to include other diseases that impact on equine health and the ability to trade, e.g. Dourine.

Dr Camilla Weyer will head up the epidemiology unit. She is supported by an Animal Health Technician, Ms Esthea Russouw and a Movement Control Project Co-ordinator, Ms Danielle Pienaar. The personnel above are responsible for the sourcing, consent and maintenance of sentinel surveillance horses and foals and monitoring movements into and out of the AHS Controlled Area. At present the surveillance samples taken from the sentinels are submitted to the Equine Research Centre for processing. The expense of the sample testing is currently carried by the ERC with co-funding from THRIP.

### 5.2.1 Key elements of the surveillance system

Development of an integrated surveillance system that fulfils OIE and EU requirements

1. Systems for recording, managing, analysis and reporting of diagnostic, epidemiological and surveillance data.
2. Development of the AusVet online data system to maintain the census, movement control integration of the laboratories, and automated reporting of the surveillance results in the DAFF and OIE formats.
3. Systems to comply with OIE and EU requirements for reporting particularly of new outbreaks in the surveillance area, and throughout the country.
4. Systems for early detection to identify and investigate outbreaks of disease, with an inherent impact on horse movement (this applies to Influenza, AHS, and other transmissible diseases).
5. Systems for clinical, serological, virological, vector surveillance and surveillance in wildlife, depending on the epidemiology of the disease in the population.
6. Methods to demonstrate absence of infection in the absence of clinical signs of disease.

Following the epidemiologic consultation with AusVet in November 2013, the key components involved in the AHS surveillance programme have been initiated by Dr Camilla Weyer with the Western Cape (Boland) Veterinary Authority.

- Early disease detection (passive clinical surveillance)
- To prove absence of virus circulation in the AHS controlled area through
  - Sentinel surveillance
  - Foal surveillance
  - Negative reporting system
  - Wildlife surveillance (opportunistic)
  - Vector surveillance (quarantine station)



## 5.3 EQUINE RESEARCH CENTRE FUNDING

### 5.3.1 ERC Core Funding support from industry



**Prof Alan Guthrie**

The Equine Research Centre (ERC), Faculty of Veterinary Science, University of Pretoria, has operated for the last 24 years with significant success. The Director, Prof Alan Guthrie, is a world renowned authority on AHS, infectious diseases of horses and equine exercise physiology. He has published 108 scientific papers and authored 8 textbook chapters.



**Dr Camilla Weyer**

Dr Camilla Weyer is a Research Veterinarian with the ERC. She has an MSc and is currently completing her PhD on the epidemiology of AHS. She is based in the Western Cape and heads up the newly established Epidemiology Unit.

The core activities will also be directed towards maintaining the South African National Accreditation System (SANAS accreditation) of the laboratory, quality assurance programmes, and staff competencies to respond to emerging equine diseases.

### 5.3.2 AHS diagnostics:

A key activity with significant unlocking potential for the export market is to demonstrate AHS negative status in horses in quarantine. The development of the RT-PCR test and adaptation by three laboratories in South Africa is leading to guideline changes internationally for the diagnosis of AHS.

- DAFF recognition of the RT-PCR test developed at the ERC, OVI and Deltamune is complete.
- OIE validation of the RT-PCR developed at the ERC as a prescribed test for international trade: this is underway in four reference laboratories of the OIE and Singapore. To date the



international transport of infectious specimens has remained a stumbling block, delaying the process. This has been resolved.

- Develop a test method to determine if a positive RT-PCR is the result of the presence of field-virus or modified live vaccine virus. This differentiation protocol is underway with specific support of the Thoroughbred Racing Trust.
- Develop an investigation process to determine that a positive RT-PCR result is either a true positive, indicative of the presence of AHSV and therefore an outbreak, or an unresolved (false) positive which does not indicate an outbreak and would not result in any loss of AHS status.
- Develop the existing RT-qPCR for alternate diagnostic platforms, which may be more appropriate for use internationally, or more cost-effective.
- Validate the serotype specific RT-qPCR for AHS.

### 5.3.3 National Horse Racing Authority Drug Administration Trials:

As part of their requirements for quality assurance within the NHA drug testing laboratory, the laboratory has to receive incurred blood and urine samples from horses that have had therapeutic and prohibited substances administered by a competent authorized institutional animal care and use committee. ERC has fulfilled this role for the NHA laboratory since 1990. A cohort of horses is maintained for this purpose. No co-funding for this work is currently received from the NHA.

## 5.4 ADDITIONAL PROJECTS RECOMMENDED BY THE SCIENTIFIC ADVISORY BOARD UNDER THE EQUINE HEALTH FUND (The budget for these projects is not included under the outline of the future strategy for year one under 1.3 above.)

### 5.4.1 Investigation of the Northern Cape as an AHS free zone

To ensure long term viability, the choice of an alternative AHS free area should be an area which is historically free of AHS, where both species of vector *Culicoides* are absent or very rare; and an area which has a low equine population with relatively few movements.

A study done by Dr Christine Schutte in 2011 revealed the existence of three areas in which the local equids were entirely AHS antibody-free to the west of Springbok, within the Namaqualand Sandveld Bioregion (NSB).

Mr Rudy Meiswinkel, an entomologist, completed an evaluation project in May 2014, in which he found that a large area in the Northern Cape Province seems never to have been affected by African horse sickness since records began nearly 300 years ago.

Ecologically the NSB is extremely arid and sandy and will be hostile to both insect vectors for African horse sickness. It is anticipated that changes within the NSB wrought over the longer term by man should not result in large populations of *Culicoides* vectors developing locally.

The Benguela Current has an ameliorating effect on the local climate, with frost absent and temperatures seldom rising above 25°C. Offshore, the system of cold water upwelling is influenced directly by the South Atlantic anti-cyclone pressure system, producing strong winds that blow inland from the southwest; in other words, no 'midge-bearing' winds blow from inland over the coastal plain towards the sea.

1. Expert opinion will be required to determine if one of the two coastally situated airstrips (Alexander Bay and Kleinsee) would be suitable as an airport to service the export industry.
2. Expert opinion will be required to assess the feasibility of developing the required infrastructure to quarantine and manage horses for export.
3. A thorough entomological survey of the eastern half of the NC is needed to understand just where *Culicoides* vector abundances translate into increased risk and what the contributing factors may be. This information is required to demarcate more precisely the possible position and extent of an AHS-free zone.
4. A thorough census of all animals in the area and a comprehensive serological survey will need to be undertaken to support a risk analysis.

(Estimated budget R1 062 000 for year one)

#### 5.4.2 AHS vaccinations of horses in indigent high risk areas and sample collection of suspect cases



To support the protection of the "Free-Zone", horses should be vaccinated in high risk areas. 3000 doses of AHS vaccine will be bought and distributed to identified high risk indigent areas. Sample collection of suspect cases will be encouraged and co-ordinated in conjunction with State Veterinarians. (The African Horse Sickness Trust has provided an early warning of case-suspects through the website, and has distributed vaccine to indigent populations and rural areas in an attempt to reduce disease transmission. The activities of the Trust will be transferred to the Epidemiology Unit.)

Principle investigator: Dr Camilla Weyer

(Estimated budget R472 640)

### 5.4.3 Eradication of Contagious Equine Metritis



*CEM Treatment with Dr Martin Schulman and students*

Following the outbreak in 2011, as a result of countrywide screening for CEM, trace back and follow-up, the DAFF are finalising data to declare the outbreak that was identified in 2011 over. In order to do so, three high risk pockets of horses still need to be tested.

Continued screening is required to work towards declaring the country free of CEM. Most of the screening costs will be borne by the respective industries but additional support will be required to assist the DAFF in analysing data and testing stallions that are not covered under the screening program.

Principle investigator: Prof Alan Guthrie and Prof Martin Schulman  
(Estimated budget: R 343 089)

### 5.4.4 Equine Encephalosis Virus as a cause for abortions

The prevalence of EEV in the Western Cape and role of EEV in abortions will be investigated. The hypothesis is that circulation of EEV may be a significant cause of abortions in broodmares. The study is relatively small, but will add to the body of evidence for combined testing of AHS and EEV.

Principle Investigator: Mr Leonard Flemming (Microbiologist at Drakenstein Animal Hospital)  
(Estimated budget: R 250 000)



*"Dressage SA and the South African Equestrian Federation sent a Team to the World Equestrian Games in Normandy, France this year (2014).*

*South African Dressage Riders are now competing at top international level, the potential for export of horses to compete at this level knows no bound."*

**Sue Horne – Chairman – Dressage SA**

#### 5.4.5 Projects that have been discussed for which there is not yet a project proposal or budget

##### *Development of a lockdown quarantine facility*

The Export Strategy Meeting held in April 2014 identified the objective to export from an infected zone through a “Vector Controlled Lockdown Facility”. Export from an infected area with lockdown facility, supported by PCR testing may enable a shortened quarantine period to 14 days.

This needs a specialist purpose built facility, and a purpose built transport vehicle with vector protected loading to demonstrate that the horses are transported in a vector free environment from the start of pre-export quarantine to delivery in the importing country.



*Kenilworth Quarantine Station*

The first step would be to consider upgrading Kenilworth quarantine station to provide for a total lock-down quarantine i.e. provide exercise and loading facilities inside the facility under vector protection. Initially, it would be easier to persuade importing countries to accept horses under total lock down quarantine from an area that has a history of AHS control and a low incidence of infection.

Once the above is accepted and in operation, the second step would be to build a specialist facility near OR Tambo International Airport (ORTIA). (Appraisal and feasibility will include evaluating the best possible position for the quarantine station in either Gauteng, the Western Cape or the Northern Cape Provinces.)

The first studies have been completed at the ERC to provide the evidence for adequately vector protected airplane jet stalls.



(No budget estimate is attached to this development as it is anticipated to be a private initiative or through Kenilworth Racing.)

#### *Equine Herpes Virus infection and performance of racehorses*

Following the project on the prevalence of respiratory viruses at the Thoroughbred Breeders Association (TBA) sales complex, the project will be expanded to include a survey in racing yards, looking at the prevalence of EHV1/2/4/5 in Cape Town and Randjiesfontein next winter.

(Estimated budget for year one: R100 000)

#### *Abortion investigation and reporting*

The aim of this project is to establish an abortion-reporting mechanism on Thoroughbred studs with diagnostic intervention. Investigations will focus on what is prevalent & target EHV-1 & clarify the role of EEV.

(Estimated budget for year one: R250 000)

#### *Dourine surveillance in the Western Cape and Northern Cape*

One of the requirements for international trade is to declare the export area free of Dourine. The lack of a Dourine surveillance system was highlighted during the FVO inspection in 2013. The available tests for screening for Dourine are problematic and require validation.

Co-ordinating validation of tests for Dourine and establishing a surveillance system for Dourine in the Western Cape Province need to be addressed in this study.

(Estimated budget for year one: R250 000)

## 5.5 AHS VACCINE DEVELOPMENT



*Vaccine trial with Prof Alan Guthrie, Mr Chris Joone and Mr Matjjane*

Development of a recombinant DIVA AHS vaccine covering all known serotypes is essential to progress trade as it represents both a move from the live-attenuated vaccine, which poses a transmission risk, and represents an emergency solution should an outbreak occur in an AHS free country. The development of a safe and effective vaccine will require approximately R10 -R12 Million per candidate vaccine, and 3-5 years of development time.

Three potential vaccine candidates have been identified by different groups of researchers, each development requires support from industry to be able to complete the regulatory process. 1) Merial with the University of Pretoria and UC Davis; 2) Deltamune 3) UK – Pirbright, Animal Health Trust and Pfizer.

### 5.5.1 Equine Research Centre Vaccine

Merial, with the University of Pretoria and UC Davis, have developed a recombinant vaccine using the canary pox backbone which takes big genes. (AHSV genes are big) Only field virus is used to challenge as AHSV pathogenicity changes when it is put on tissue culture. The first serotype developed was serotype 4. Serotypes 5 and 9 followed. (Current modified live vaccine does not include serotype 5 due to cross protection with serotype 8; does not include serotype 9 due to cross protection with serotype 6.)

During the proposed budget period 2015 further development of this vaccine will require 2 phase II AHS challenge studies. The lockdown quarantine facilities available at the UP Faculty, provides a significant offset in cost as compared to the private sector facilities. Further phase III studies would commence in 2016/7 based on the results of the phase II studies, and an agreement to manufacture vaccine with Merial.

### 5.5.2 Development of AHS vaccine at Deltamune

Deltamune are taking a novel approach to reconstruct a vaccine virus by building the protein that confers immunity without the active infectious virus components. This is a new and as yet untested approach. The scientific advisory board reviewed a verbal presentation of the Deltamune development. Further more rigorous review is required ahead of a funding commitment.

Although no budget has been established it is anticipated to be around R1 200 000 in the budget year 2015, rising to R10 000 000 per year for 2016-2018 period should this approach be found to be immunogenic and potentially effective.

The initial stages of vaccine development merit support as scientific funding is not available. Once the phase II work is complete, it may be feasible to raise biotech investor funding to complete the phase III and marketing studies.



*"South African endurance horses are some of the most competitive horses worldwide. The proof is that in Dubai and in Abu Dhabi the fastest time in 80, 120 km and 160 km races was achieved on South African horses. Our horses compare on a fair base with horses from all over the world, and the results are general knowledge.*

*It is expensive to export horses. The most expensive part is the quarantine and travel costs. Only a quarter of the money the seller receives is for the actual cost of the horse. If we can reduce quarantine costs, a lot more endurance horses will be exported to the rest of the world from South Africa. It will be positive for the endurance industry and it will also keep the sport alive. It will also be positive for the economy of the country.*

*The South African riders would love to compete with their own horses against the rest of the world in world championships. At this stage we have to lease horses at a high cost from overseas owners. Alternatively horses are exported from South Africa via a lengthy four month quarantine process at high costs. This is not conducive for the training of the horse before a championship. The overseas Vets also support the idea of South African riders competing on their own horses. They believe that it will be interesting to see our riders – they are highly ranked in the world – on their own horses competing overseas."*

**Dr. Henk Basson – Endurance South Africa**

**BUDGET FOR PROJECTS INCLUDED UNDER 5.4 AND 5.5  
(NOT INCLUDED UNDER 1.3 ABOVE)**

	Year One	Year Two	Year Three
<b>AHS Vaccine Development</b>	R 1 800 000	R1 908 000	R 10 000 000
<b>EHF Project: Surveillance Northern Cape</b>	R 1 064 000	R 0	R 0
<b>EHF Project: AHS Vaccinations</b>	R 472 640	R 500 998	R 531 058
<b>EHF Project: CEM Eradication</b>	R 343 089	R 200 000	R 100 000
<b>EHF Project: EEV</b>	R 250 000	R 0	R 0
<b>EHV and performance of racehorses</b>	R100 000	R0	R0
<b>Abortion investigation and reporting</b>	R250 000	R0	R0
<b>Dourine surveillance</b>	R250 000	R200 000	R100 000
<b>Lockdown quarantine facility</b>			
<b>Total:</b>	<b>R 4 529 729</b>	<b>R 2 808 998</b>	<b>R 10 731 058</b>



Where in this wide world can man find nobility without pride,  
 Friendship without envy,  
 Or beauty without vanity?  
 Here, where grace is served with muscle  
 And strength by gentleness confined  
 He serves without servility; he has fought without enmity.  
 There is nothing so powerful, nothing less violent.  
 There is nothing so quick, nothing more patient.  
**~Ronald Duncan, "The Horse," 1954**

THANK YOU TO  
OUR CURRENT CONTRIBUTORS



Gold Circle



The Thoroughbred Racing Trust



Kenilworth Racing



Phumelela (Pty) Ltd



Thoroughbred Breeders Association



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