

	DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES DIRECTORATE ANIMAL HEALTH
	AFRICAN HORSE SICKNESS SURVEILLANCE STRATEGY FOR THE AFRICAN HORSE SICKNESS CONTROLLED AREA
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African Horse Sickness Surveillance Strategy For The African Horse Sickness Controlled Area

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VERSION HISTORY

Version Date	Primary Content/Changes	Comments
September 2012	<ul style="list-style-type: none"> • Initial plan primarily focussed on sero-sentinel surveillance. • Included foal sero-surveillance at 2% MEP 	<p>Authored by Western Cape Department of Agriculture</p>
September 2016	<ul style="list-style-type: none"> • Included description of vector surveillance during outbreaks in the controlled area • Included PCR based sentinel surveillance to detect 2% MEP • Foal sero-surveillance removed as this was not being practically implemented • References to OIE and EU legislation included for reference 	<p>The industry consulted with AusVet (Pty)Ltd (Dr Evan Sergeant and DAFF) in 2013 to review the surveillance plan. Detailed recommendations were provided with the first full season including PCR sentinel surveillance being Sep 2014 – Aug 2015. The Sept 2016 revision was to formalise the recommended strategy and to remove components that were not being practically carried out</p>
July 2018 (CURRENT)	<ul style="list-style-type: none"> • Editorial changes to show changes to the plan and included official sign-off by DAFF • Laboratories doing testing amended to reflect the current situation • Update of process links to show response to AHS suspect surveillance samples/clinical signs 	

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ACRONYMS

AHS	African horse sickness
AHSV	African horse sickness virus
ARC	Agricultural Research Council
DAFF	Department of Agriculture Forestry and Fisheries
ERC	Equine Research Centre (University of Pretoria)
i-ELISA	Indirect ELISA
FSS	Foal Surveillance Strategy
FZ	AHS Control Zone: Free Zone
hn-RT-PCR	Hemi-nested reverse transcriptase PCR
IZ	AHS Infected Zone
MEP	Minimum expected prevalence
OVR	Onderstepoort Veterinary Research (previously OVI)
PCR	Polymerase Chain Reaction
PINT	Plaque Inhibition Neutralisation Test
PS	Passive Surveillance
PZ	AHS Control Zone: Protection Zone
RT-qPCR	Real Time Reverse Transcriptase PCR
SNT	Serum Neutralisation Test
SPVL	Stellenbosch Provincial Veterinary Laboratory
SS	Sentinel Surveillance
SZ	AHS Control Zone: Surveillance Zone
TS RT-qPCR	Type-specific Real Time Reverse Transcriptase PCR
UPVTD	University of Pretoria – Veterinary Tropical Diseases
UPEDS	University of Pretoria - Equine Diagnostic Services
VI	Virus Isolation
VS	Vector surveillance
WS	Wildlife Surveillance

INTRODUCTION

African horse sickness (AHS) is an economically and socially important disease of equines in South Africa. The Western Cape Province is especially closely associated with African horse sickness as all four AHS control zones within South Africa fall fully or partially within the Province. This surveillance plan identifies the areas where surveillance for the disease is performed and is used as a basis for State and Private vets who are then aware of the surveillance strategy of the Province. A description of the disease and control measures when an outbreak occurs can be found within the Provincial Veterinary Services ANIMAL DISEASES CONTROL - CONTINGENCY PLANS. To view a map of the AHS control zones please visit <http://www.elsenburg.com/services-and-programmes/veterinary-services-0#s=Animal-Health-and-Disease-Control&d=African-Horse-Sickness> in your web browser.

The principles of this AHS surveillance strategy are based on the guidelines published by the OIE in the Terrestrial Animal Health Code and the following sections have reference:

- Chapter 1.4: Animal Health Surveillance
- Chapter 1.5: Surveillance for arthropod vectors of animal diseases
- Chapter 12.1: Infection with African horse sickness virus
 - Article 12.1.1: General provisions
 - Article 12.1.11: Introduction to surveillance
 - Article 12.1.12: General conditions and methods for surveillance
 - Article 12.1.13: Surveillance strategies

Furthermore, the surveillance strategy also relates to including activities required by the import requirements of live horses to the European Union from South Africa, as detailed in the *Commission Decision of 8 August 2008 on the temporary admission and imports into the Community of registered horses from South Africa*.

- Section 6: Monitoring

DESCRIPTION OF OBJECTIVES

This surveillance plan is proposed to establish two objectives:

1. To primarily detect current suspect and confirmed incursions of AHS within the Protection (PZ), Surveillance (SZ) and AHS Free zones (FZ) of South Africa.
2. To secondarily detect retrospective incursions of AHS within the Protection, Surveillance and AHS Free zones of South Africa.

TYPE OF SURVEILLANCE

For ease of reading, the surveillance strategies are listed below and referred to by their acronyms throughout the rest of the document.

1. **Passive Surveillance (PS)**

PS is the surveillance strategy upon which all other strategies listed below rely on, and is essentially a clinical surveillance program. It is the mainstay of the surveillance strategy within the AHS PZ, SZ and FZ. This surveillance is based on collaboration between State veterinarians, equine industry and private equine veterinarians in that the private veterinarians are tasked with informing, investigating and where applicable requesting assistance from the state in all suspect equine mortalities where AHS would be a differential diagnosis. In horses, clinical signs may include pyrexia, oedema, hyperaemia of mucous membranes and dyspnoea. From the state and industry perspective, there is a commitment to assist private veterinarians in their investigations and to maintain an appropriate level of awareness regarding the passive surveillance for AHS. Suspected cases detected by passive surveillance should always be confirmed by laboratory testing.

2. **Sentinel Surveillance (SS)**

SS is a well-known and utilised surveillance strategy used internationally whereby a set number of susceptible animals are confined to an area where surveillance of a disease is paramount and surveying those animals gives an indication of what is occurring in the greater population. SS within the scope of this document is currently limited to the AHS SZ whereby approximately 150 equines are recruited and bled on a monthly basis and tested for AHS. All 150 sentinels are tested for viral RNA (RNA-sentinels) and approximately 60 unvaccinated recruits are tested for AHS antibody (sero-sentinels) on a monthly basis.

3. **Wildlife Surveillance (WS)**

WS is currently performed on an ad hoc basis where zebra are sampled within the various zones prior to being moved or during procedures. This surveillance is not extensive due to a low frequency of movement and it is estimated to be limited to approximately 20 animals within the AHS control zones yearly at best.

4. **Vector surveillance (VS)**

The *Culicoides spp.* vector populations in the AHS control zones have been studied and competent vectors of the disease occur in the region. Vector surveillance is therefore performed to accomplish two major goals:

- Detection of vectors within the vector protected export quarantine station to detect breakdown in vector protection
- Understanding of the vector demographics during AHS incursions in the controlled area through trapping during outbreaks

TARGETED SPECIES AND CATEGORIES

Surveillance Strategy	Species Associated	Category Associated	Associated AHS Control Zone
PS	All equines that private vets have contact with	All	All Zones
SS	All equine breeds	All	SZ
WS	Wild equids but primarily Zebra	Wild equids	Primarily SZ but also PZ and IZ within the Western Cape Province
VS	n/a	n/a	FZ (ongoing), SZ and PZ

STATISTICAL BASIS FOR NUMBER OF ESTABLISHMENTS SAMPLED

Surveillance Strategy	Number of Establishments	Target sampling size (target)
PS	Not defined	All properties with a vet associated
SS	+ - 50 properties	150 horses (150 RNA based, 60 sero-sentinels)
WS	n/a	All available animals
VS	1 ongoing in FZ; 1-3 during incursions depending on epidemiology	n/a

FREQUENCY OF SAMPLING

Surveillance Strategy	Frequency of sampling	Time period	Type of sample to be taken
PS	Constant	Year round with special emphasis on vector season between January and June every year	Dead animal sent for post mortem. If not possible then lung, spleen, kidney, liver samples – fresh on ice. EDTA samples from available blood or exudate. EDTA samples from live clinically suspect animals
SS	Monthly	Year round	Serum from the recruited sero-sentinels,

Surveillance Strategy	Frequency of sampling	Time period	Type of sample to be taken
			EDTA from the RNA-sentinels
WS	Constant	Whenever possible year round	Serum and EDTA
VS	Constant (FZ), ad-hoc (outbreak)	Constant (FZ), ad-hoc (outbreak)	Onderstepoort light trap samples decanted into ethanol.

LABORATORY TESTS USED

Surveillance Strategy	Primary lab test to be used	Labs currently used for routine testing
PS	Primarily PCR	Agricultural Research Council - Onderstepoort Veterinary Research (ARC-OVR) – hn-RTPCR) – SANAS accredited; Deltamune Oudtshoorn laboratory - RT-qPCR) – SANAS accredited Stellenbosch Provincial Veterinary Laboratory (SPVL) – RT-qPCR, Macro and histopathology– SANAS accredited
SS	Serology and PCR with follow up's including SNT and VI	OVR: i-ELISA with SNT capability for serotyping (Primary lab for sero-sentinel testing) – SANAS accredited SPVL – RT-qPCR (primary lab for RNA sentinel testing) – SANAS accredited University of Pretoria DVTD virology – VI in tissue culture –SANAS accredited
WS	Serology and PCR with follow up's including SNT and VI	OVR: i-ELISA with SNT capability for serotyping – SANAS accredited SPVL – RT-qPCR – SANAS accredited
VS	Macroscopic count, PCR	ARC-Entomology;

REPORTING SYSTEM/PROTOCOL USED FOR SUSPECT AND/OR POSITIVE AHS RESULTS

The reporting of AHS surveillance results all fall into the basic reporting system for all exotic, controlled and notifiable diseases under Act 36 of 1984 within South Africa. Initial AHS or EEV (amongst other AHS differential diagnoses) suspect or positive cases are reported to the regional State Veterinarian, then to the Western Cape Veterinary Services Epidemiology section who assist in creating an SR1 (national disease reporting standard) in collaboration with the regional State vet. This is confirmed by the Provincial Veterinary Services Director and reported to DAFF.

General (negative) surveillance results are maintained by the regional State vet with collation performed by the Provincial Epidemiology section when necessary.

FOLLOW-UP INVESTIGATIONS OF POSITIVE RESULTS FOR AHS

Outbreak investigation procedures of positive cases within the AHS controlled area are covered by the Provincial Veterinary Services ANIMAL DISEASES CONTROL - CONTINGENCY PLAN and the Western Cape Contingency Plan for African horse sickness.

GENERAL PROCESS FLOW FOR POSITIVE/SUSPECT RESULTS

Two major processes are associated with the surveillance program for AHS in the controlled area.

1. Sentinel surveillance recruits that die or have an infectious disease that has AHS as a differential diagnosis. The current version of this process can be downloaded [here](#)
2. Root cause investigation to confirm a diagnosis of AHS where any AHS suspicion in any surveillance process will form a source of investigation. The current version of this process can be downloaded [here](#)

