

African horse sickness sentinel surveillance 2023

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Overview

The African horse sickness (AHS) sentinel surveillance program provides additional confidence of AHS freedom in the AHS free (FZ) and surveillance zones (SZ) of South Africa. The program incorporates the monthly sampling of recruited horses proportionately selected within the zones, based on the estimated underlying population. Historically, the program had two components – a sero-sentinel program that evaluated the changing serological status of horses on a month-to-month basis; and a PCR-based program that is used to detect the presence of AHS viral RNA within recruits. In 2023 the serological component of the program was suspended, with the PCR-based program remaining the focus of the program for the foreseeable future.

The PCR sampling target is drawn up to detect AHS at approximately a 2% minimum expected prevalence (with a 95% confidence level), resulting in a monthly sampling target of 150 animals. The vaccination status of PCR sentinels does not influence their recruitment, unless vaccination against AHS took place sufficiently recently to result in positive PCR results on initial testing.

A detailed description of the original program is

available in the January 2016 Western Cape Epidemiology Report. The summary report for the 2021/22 season can be found in the July 2023 Epidemiology Report. All other reports can be found at www.myhorse.org.za.

Viral RNA PCR testing is generally performed at the Western Cape Provincial Veterinary Laboratory (WCPVL) in the sentinel surveillance program. During 2023 however, samples were tested at the University of Pretoria/Equine Research Center's Molecular Diagnostics Laboratory as the WCPVL was undergoing renovations. The PCR test method used is a University of Pretoria (Equine Research Center) developed and WOAH validated real-time RT-PCR (Guthrie et al. 2013).

General overview of sampling and results

1719 PCR sentinel samples were analysed from 63 different farms, at an average of 143 samples from, on average, 48 different farms per month. All samples tested negative.

Investigations

There were no follow-up investigations as a result of

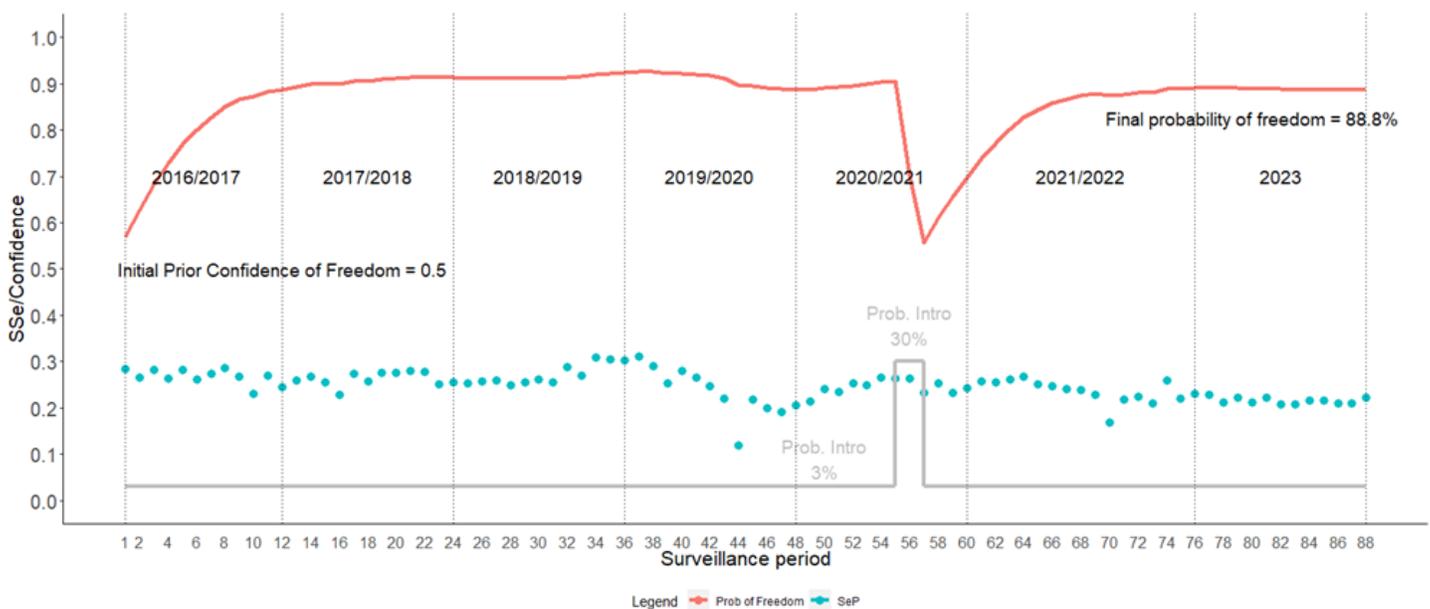


Figure 1: The sentinel surveillance sensitivity of individual surveillance periods (SeP dots) with probability of freedom curve (red line) for the past seven surveillance seasons: the season currently reviewed is the 2023 calendar year. Probability of AHS introduction of 3% is set for periods where no AHS outbreaks are present in the AHS controlled area (grey line at 0.03 on y-axis) but at 10X that rate for where outbreaks are present as in April and May 2021 in the Cederberg AHS Protection zone.

suspect or positive laboratory results during the year. There was however an investigation into a fever reaction on a sentinel property in December 2023, though the fever was not in a sentinel animal. The affected animal presented with fever and mild ataxia on the 22 December 2023. Infection with equine encephalosis virus (EEV) was considered a differential diagnosis by the attending veterinarian.

The sample that was taken tested negative for both AHS and EEV RNA. There were 4 sentinel farms in total, within a 10 km radius of the fever case. A total of 16 sentinels from within this area were tested (all negative) in the December 2023 sentinel sampling cohort.

Spatial considerations

The sentinel surveillance program is based on a proportional sampling system with most sentinels in areas of the surveillance area that have the highest population of horses. The current sentinel farms' distribution in the PCR sentinel program are based on the underlying population. Some improvement has been made in the Paarl area when compared to 2021/2022, with the Mitchells Plain area still requiring most improvement.

Surveillance system evaluation

The surveillance program is designed to detect AHS in the AHS surveillance zone at a minimum expected prevalence of 2% (MEP). In this section of the report, we establish the monthly sensitivity of the surveillance program. Note that previous analyses evaluated the program at a 5% MEP based on European Commission Decision 2008/698 requirements – this legislation is now repealed and, since the program aims at a 2% MEP, the evaluation thereof has been adjusted to this level.

The analysis is based on evaluating sensitivity of surveillance programs (Martin et al. 2007). The historical surveillance outcome is considered as it provides information that aids in determining an accurate final probability of freedom as of December 2023. The final probability of freedom from Sept 2016 through December 2023 (88 months) was 88.8% - see Figure 1.

The sensitivity of the sentinel surveillance alternates

around the 25-30% mark throughout. This is the seventh AHS season running where cases of the disease have not been detected in the AHS surveillance and free area, although an outbreak of AHS occurred in the AHS protection zone in 2021

Discussion and Conclusion

The primary goal of demonstrating AHS freedom in 2023 was achieved. A 7-year review of sentinel results show that the probability of freedom attained for this program, at an animal design prevalence of 2% and herd-level design prevalence of 2%, shows a 88.8% probability of freedom from AHS in the AHS surveillance and free zones. This level was achieved in the face of the AHS outbreak that occurred ~ 88km from the border of the AHS surveillance zone in 2021. It further does not take into consideration the passive surveillance component. Spatial representativeness remains challenging, but gains have been made in the Paarl region.

Acknowledgements

This program would not be possible without the support of the horse owners in the AHS surveillance zone who freely give of their time and resources to allow and facilitate the monthly sampling of horses. We are grateful to the University of Pretoria Molecular Genetics Laboratory who performed the testing of samples this season.

In this season the sentinel program was again achieved through collaboration between the Western Cape Department of Agriculture (Veterinary Services) and South African Equine Health and Protocols (SAEHP). In this regard we specifically acknowledge Dr Tasneem Anthony. The WCDOA also currently fund the testing costs associated with the program. We are grateful to the SAEHP team who are directly involved with the program: Esthea Russouw and Lizel Germishuys.

References

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- Martin, P.A.J., Cameron, A.R. & Greiner, M., 2007. Preventive Veterinary Medicine, 79(2–4), pp.71–97

Outbreak events

Outbreaks of **bluetongue** were reported on three **sheep** farms in the **Vanrhynsdorp** area. Very hot temperatures were experienced in the area, which is unusual for March. Some rains occurred and together with irrigation water this provided a breeding environment for disease vectors.

Salmonella Enteritidis was cultured from routine samples taken from four broiler **chicken** farms/hatcheries in the **Swellendam, Malmesbury** and **Worcester** state veterinary areas.

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