Equine disease control

Surveillance report

Dourine 2024

JD Grewar & CT Weyer
2024

Surveillance Report

Disease	Dourine in horses
Coverage Area	Western Cape – AHS Surveillance Zone
Period	2024
Authors	John Grewar and Camilla Weyer

Introduction

Since 2018, active dourine surveillance has been conducted in the Western Cape Province through the testing of horses enrolled either as sentinels - primarily sourced from the African horse sickness (AHS) sentinel programme - or through structured surveys of randomly selected horses within the AHS free zone, as implemented in 2020. The surveillance strategy has aimed to test sentinel animals at six-monthly intervals.

During 2018 and 2019, surveillance activities were limited to the first half of each year. In 2020, a targeted survey of horses within the AHS free zone was undertaken during the first half of the year. From 2021 onwards, the programme achieved the intended biannual testing target, with sentinel horses sampled during mid-year and end-of-year cohorts.

An overview of dourine, including its epidemiology and the rationale for ongoing surveillance, has been comprehensively described in previous reports, which are available via the referenced links or through https://www.myhorse.org.za. Accordingly, this report does not repeat those background details.

The purpose of the present report is to provide evidence supporting freedom from dourine within the geographic area where active surveillance is conducted for AHS, namely the AHS surveillance and free zone of the Western Cape Province, based on surveillance activities undertaken during the 2024 reporting period.

Surveillance parameters

Table 1: Surveillance parameters used in design and evaluation of the Dourine surveillance program in 2024.

Parameter	Value	Comments
Population at risk	16000	All horses in the surveillance and free zones. 16000 is an estimate; there are currently 18336 and 765 horses registered in the AHS surveillance and free zones respectively although data is captured only for horses entering the area.
Design Prevalence	~5%	Minimum expected prevalence in the population should dourine occur; parameter taken from the serological survey requirements of the EU for AHS sentinel surveillance given that the same population was used for the dourine sampling.
Test Sensitivity	90%	Estimate based on best scientific guess. The sensitivity of the complement fixation test (CFT) has not been established, although given the false positive rates (see specificity) the sensitivity is likely to be relatively high. The CFT is seen as a gold standard for individual horse testing prior to export and this also supports a test with relatively good sensitivity.
Test Specificity	Unknown but system specificity of 100% assumed	The CFT test is prone to false positives and probably does not have a particularly good specificity. However, for the purposes of surveillance evaluation and given that any positive CFT result will be investigated to establish a final diagnosis a specificity of 100% was used in establishing the outcome of the sensitivity of the surveillance
Type 1 error	5%	Used to provide a final probability of 95% that Dourine was not present if it was not detected using the surveillance parameters.

South Africa's African horse sickness (AHS) sentinel surveillance programme, operating within the AHS free and surveillance zones, targets the sampling of approximately 150 horses per month using PCR testing. In addition to PCR testing, serum samples are collected from all sentinel horses. A randomly selected subset of these sera is used to support the dourine surveillance system, traditionally drawing on samples collected during the June and December sentinel sampling rounds each year.

During 2024, logistical constraints during the mid-year sampling period, together with laboratory closures towards the end of the year, necessitated an adjustment to this schedule. As a result, samples collected during the August and November sentinel rounds were utilised for dourine surveillance in place of the usual June and December cohorts.

The AHS sentinel surveillance programme is designed to sample horses in proportion to the underlying population at risk, employing a spatially stratified, gridded sampling framework to ensure geographic representativeness across the surveillance area (see Figure 1).

Consent and ethics

Ethics approval was not obtained nor required for this survey since the samples were used from the existing AHS sentinel surveillance program. Sentinel owners and managers have previously provided consent for this surveillance program.

Results

A total of 99 horses were selected from 33 locations across the AHS surveillance zone in August 2024. In November 99 horses were selected from 28 locations. Proportional numbers of horses sampled across the surveillance zone are shown in Figure 1 below. Most samples were taken from an area of approximately 50-75 km around the Kenilworth Quarantine Station, from which horses are exported.
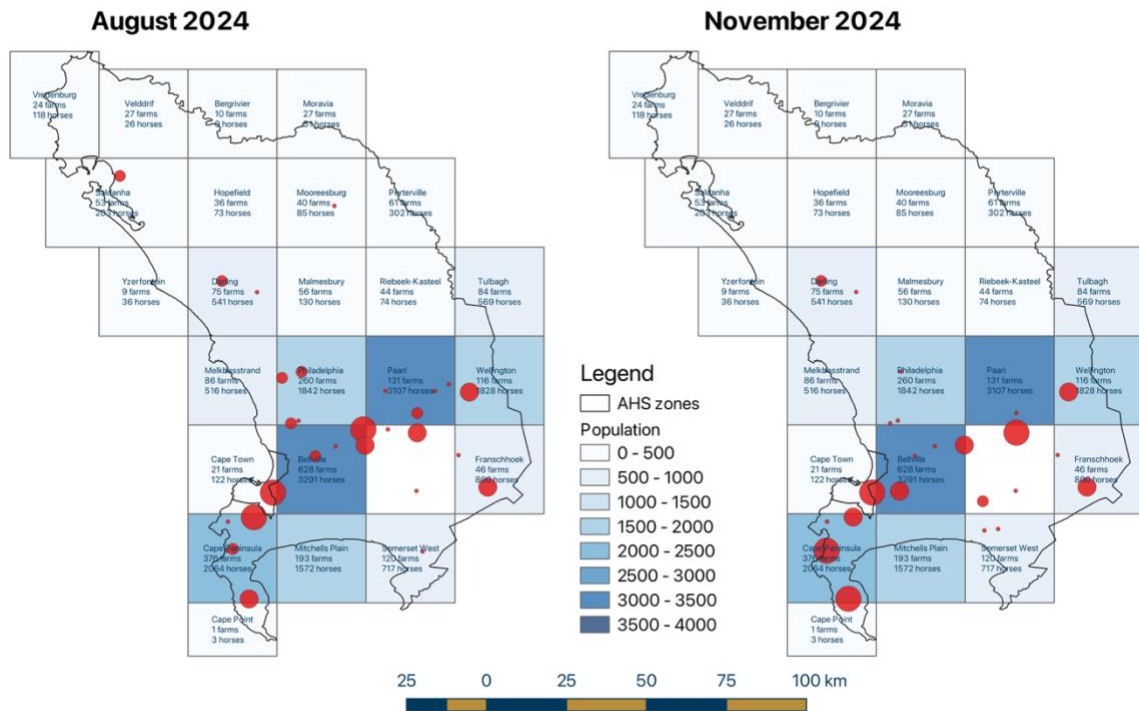
Figure 1: Dourine survey locations showing proportional circles for number of equines tested per location in August and November 2024 respectively. The underlying population at risk is shown as a light to dark blue gradient, this to show that locations were chosen to reflect the relative underlying population at risk per surveillance grid.

August 2024: all 99 samples tested negative for dourine antibody using the CFT – 2024-D-16077 (OVR-ARC).

Dec 2023: all 99 samples tested negative for dourine antibody using the CFT – 2025-D-00923 (OVR-ARC).

Sensitivity of the surveillance program

The sensitivity (and resulting probability of freedom) of the surveillance program is shown in Table 2 below. This evaluation is independent of any prior surveillance. While the sentinel surveillance program is based on a single stage sampling strategy (evaluated in Column 2 of Table 2) we have estimates of the underlying number of herds in the surveillance zone as well as estimates of the herd sizes of the sampled herds. This allows an estimate of surveillance sensitivity in a more realistic setting (Column 3 of Table 2). Note that in this latter analysis we reverted to an effective population design prevalence of 2% (within herd design prevalence of 20% and herd level prevalence of 10% throughout the population) – this in an effort to depict a reasonable minimum expected prevalence with so few cases of dourine reported in the prior two decades in the AHS surveillance zone (see Figure 3).

Table 2: Design prevalence with resulting surveillance sensitivity and probability of freedom outcomes for two different scenarios independently analysed: the sentinel program design prevalence and the generic values used given the history of cases in the AHS controlled area. NOTE: This evaluation is for a single point in time and does not consider previous surveillance outcomes.

Parameter	Descriptions and values based on varying data sources			
	Single stage population sensitivity		Generic prevalence to result in effective design prevalence of 2% with 2-stage analysis	
Animal level prevalence (P^*_U)	0.05		0.2	
Herd level prevalence (P^*_c)	n/a		0.1	
Effective population prevalence ($P^*_U \times P^*_c$)	0.05		0.02	
	2024 H1	2024 H2	2024 H1	2024 H2
MeanSSH - Mean herd level surveillance sensitivity	n/a		0.497	0.529
SeP - Population surveillance sensitivity	0.988	0.987	0.809	0.776
PFreeU - Confidence of population freedom – uninformed prior	0.986	0.984	0.811	0.785

With surveillance evaluation it is also appropriate to evaluate probability of freedom outcomes given prior surveillance events. In Figure 2 below, we show all 11 surveillance events undertaken to date in the AHS surveillance and free zones (see previous reports). Where surveillance was missed (second half of 2018 (H2), 2019 (H4) and 2020 (H6)) a zero sensitivity is assumed. Note also that the surveillance in 2020 (H5) was targeting the AHS free zone only, but the evaluation below assumes a population at risk across the AHS free and surveillance zone for standardisation purposes.
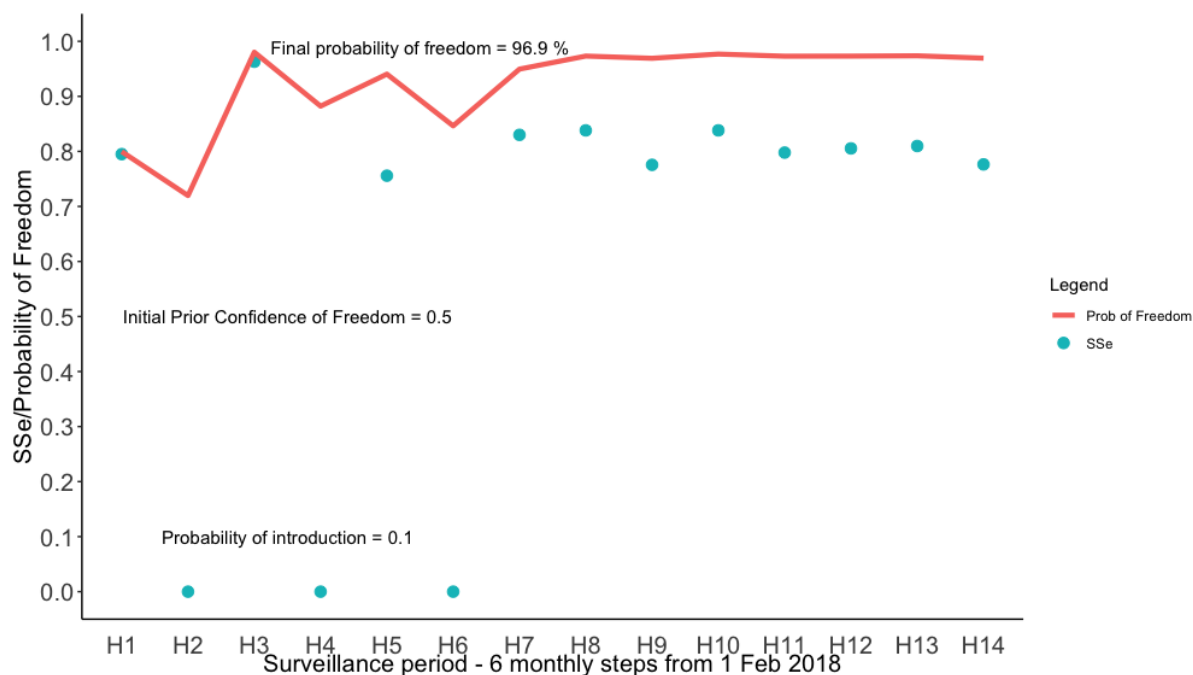

Figure 2: Surveillance system sensitivity and probability of freedom assuming an introduction probability of 10%, an underlying herd and animal prevalence of 20 % and 10% respectively and an uninformed prior probability of 50% in period 1.

The dourine probability of freedom in the AHS free and surveillance zone in H1 and H2 2024, given the 2024 surveillance efforts alone, ranges between 78.5% and 98.6% depending on the analysis used. The overall probability of freedom taking prior surveillance into account is 96.9%.

Discussion

Stand-alone surveillance efforts like the one described here supplement the current clinical passive surveillance and Thoroughbred pre-breeding dourine surveillance efforts in South Africa.

Figure 3 shows all dourine cases reported in South Africa from 1993 through Dec 2024 (data accessed Apr 2025 from www.dalrrd.gov.za and collated to South African local municipalities). The last case in the Western Cape in 2012 occurred in a working mule in the Bredasdorp region – details of that case can be found at http://www.elsenburg.com/vetepi/epireport_pdf/February2012.pdf.
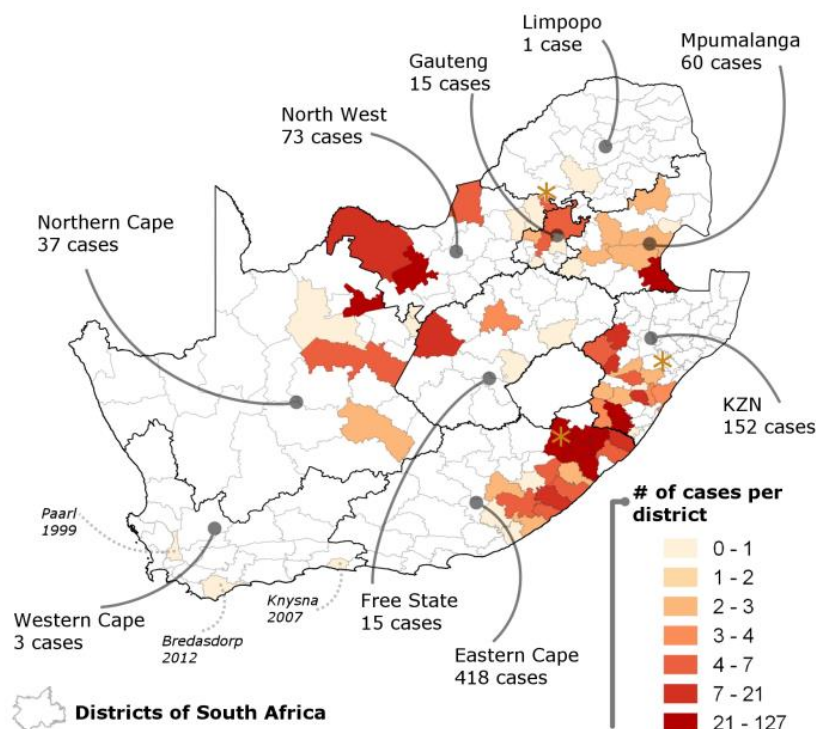

Figure 3: Historical dourine cases reported to DALRRD from 1993 through Dec 2024 (the last case as reported by DALRRD was in 2018 in the Eastern Cape) to date. Cases have been aggregated by district while case totals per province are labelled. The three cases reported in the Western Cape are also labelled specifically with the last case reported in 2012.

Acknowledgments

August 2024 results (2024-D-16077)

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Job No:	2024-D-16077
Received Date:	12/11/2024
Lab No:	12/11 G
Report Date:	15/11/2024
Sample Type:	Serum
Sample collection date:	
Performance Date:	14/11/2024 to 14/11/2024
Number of samples:	100
Purpose of Sampling:	SURVEILLANCE
Suitability of samples:	SUITABLE

Sender Details
South African Equine Health and Protocols NPC
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FINAL REPORT: Dourine Complement Fixation Test (CFT) Method BSME005

Sample No.	Species	Sample Reference	Results
1	Equine	Kentucky 1685	Negative
2	Equine	Canta Libre 8564	Negative
3	Equine	Victor 1629	Negative
4	Equine	Rango 14832	Negative
5	Equine	Bono 35342	Negative
6	Equine	Chantilly 1687	Negative
9	Equine	Ransheen 25495	Negative
10	Equine	Lily 1511	Negative
11	Equine	Angelarosa 7101	Negative
12	Equine	Beetleguese 7103	Negative

Sample No.	Species	Sample Reference	Results
15	Equine	Beauty 5806	Negative
16	Equine	Leyhla Thunder Storm (17Kyte) 19615	Negative
17	Equine	Leyhla Krystal (17Fantasy) 19617	Negative
18	Equine	Leyhla Kanama 28883	Negative
7	Equine	Sultan (Muter) 1689	Negative
8	Equine	Alfadee 25494	Negative
21	Equine	Brandy 33041	Negative
22	Equine	Exemplar 16301	Negative
23	Equine	Spirit 1510	Negative
24	Equine	Poppie 18171	Negative
13	Equine	Fijnbosch Mojo 7221	Negative
14	Equine	Shannon 1529	Negative
27	Equine	Kelty 1672	Negative
28	Equine	Wizard 472	Negative
29	Equine	The Higgs 30192	Negative
30	Equine	Nakhari 1522	Negative
19	Equine	Hercules 1655	Negative
20	Equine	Eagles Colour Code 15827	Negative
33	Equine	Areshka Rugaya 9685	Negative
34	Equine	Safiyah 42618	Negative
35	Equine	Lali 14953	Negative
36	Equine	Willow (Lady Willoway) 1568	Negative
25	Equine	Daisy 22548	Negative
26	Equine	Valentino 28730	Negative
39	Equine	Bomalia 6077	Negative
40	Equine	Daantjie 6091	Negative
41	Equine	Real Rose 6098	Negative
42	Equine	Legacy La Sagra ; Cassandra 34293	Negative
31	Equine	Sati 1524	Negative
32	Equine	Amira 42617	Negative

Sample No.	Species	Sample Reference	Results
45	Equine	Pony 24274	Negative
46	Equine	Geyerspan Haraldi 14943	Negative
47	Equine	Jurust 66 Dakar 15352	Negative
48	Equine	Candy 26565	Negative
37	Equine	Lagacys Lucky Dragon 6072	Negative
38	Equine	Calypso 6073	Negative
51	Equine	Ayla 38940	Negative
52	Equine	Kira 41377	Negative
53	Equine	Grey (Never Imagined) 1535	Negative
54	Equine	Out of the Blue 29133	Negative
43	Equine	Talula 24272	Negative
44	Equine	Ice Man 24273	Negative
57	Equine	Mirtillo 41538	Negative
58	Equine	Ben 41147	Negative
59	Equine	Midget 1531	Negative
60	Equine	Numero uno Zakoen (Sabek) 5782	Negative
49	Equine	Milo 23465	Negative
50	Equine	Midnight Sky 38476	Negative
63	Equine	Elsa 26564	Negative
64	Equine	Jasmyn 34708	Negative
65	Equine	Misty 42713	Negative
66	Equine	Lumiere Lis 27861	Negative
55	Equine	Borrasca 30617	Negative
56	Equine	Pink Lady 36931	Negative
69	Equine	RK Crysos 35417	Negative
70	Equine	RK Sorpresa 35777	Negative
71	Equine	RK Venteux 35778	Negative
72	Equine	Sweet Dreams 1546	Negative
61	Equine	Fine Pearl 5831	Negative
62	Equine	Fleur (Blommie) 16648	Negative

Sample No.	Species	Sample Reference	Results
75	Equine	Amire 1782	Negative
76	Equine	Dolce 1784	Negative
77	Equine	Duke 1785	Negative
78	Equine	Kariba 1786	Negative
67	Equine	RK Eliseo 32214	Negative
68	Equine	Othelio 35416	Negative
81	Equine	Webster 5974	Negative
82	Equine	Jupiters Juno 40989	Negative
83	Equine	Gandalf 1612	Negative
84	Equine	Kid Molloy 1613	Negative
73	Equine	Pepper 40459	Negative
74	Equine	Butterball 1797	Negative
87	Equine	Amadeus 24369	Negative
88	Equine	Skollie 29526	Negative
89	Equine	Target 39262	Negative
90	Equine	Nutmeg 1545	Negative
79	Equine	Pride 1788	Negative
80	Equine	Sea Breeze 1789	Negative
93	Equine	Griffin 1503	Negative
94	Equine	Haldago 10056	Negative
95	Equine	Ceaser 36859	Negative
96	Equine	Misty 36861	Negative
85	Equine	Tiekie 7159	Negative
86	Equine	Herneuter Lewies (Louie) 13426	Negative
97	Equine	Pyrotec 36863	Negative
98	Equine	Meredith 36863	Negative
99	Equine	Patches 36866	Negative
100	Equine	Ghost 31270	Negative
91	Equine	Lady da Layia 30927	Negative
92	Equine	Acapulco 37209	Negative

Comment:

Disclaimer:

Samples(s) Submitted was/were suitable for testing
Yours Faithfully

Maria Mathekga
SANAS Technical Signatory
for Senior Manager Research: Animal Health and Protection

November 2024 results (2025-D-00923)

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Tel: (012) 529 9137		Lab No:	23/01 A
Fax: (012) 529 9429		Report Date:	30/01/2025
Email: Matlel@arc.agric.za		Sample Type:	Serum
		Sample collection date:	
		Performance Date:	30/01/2025 to 30/01/2025
		Number of samples:	100
		Purpose of Sampling:	SURVEILLANCE
		Suitability of samples:	SUITABLE

Sender Details
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Owner: Various
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Farm:

State Vet Information
State Veterinarian: State Vet Boland
Email:
SVBoland@westerncape.gov.za; Vivien.malan@western cape.gov.za; Solomon.Bhandi@westerncape.gov.za
Tel: 0218085026/8 / 0218085253 / 0822289076

FINAL REPORT: Dourine Complement Fixation Test (CFT) Method BSME005

Sample No.	Species	Sample Reference	Results
1	Equine	Beetleguese 7103	Negative
2	Equine	Shannon 1529	Negative
3	Equine	Beauty 5806	Negative
4	Equine	Leyhla Thunder Storm (17Kyte) 19615	Negative
5	Equine	Leyhla Krystal (17Fantasy) 19617	Negative
6	Equine	Hercules 1655	Negative
7	Equine	Poppie 18171	Negative
8	Equine	Daisy 22548	Negative
9	Equine	Valentino 28730	Negative
10	Equine	Eagles Colour Code 15827	Negative

Sample No.	Species	Sample Reference	Results
12	Equine	Brandy 33041	Negative
13	Equine	Spirit 1510	Negative
14	Equine	Nakhiri 1522	Negative
15	Equine	Sati 1524	Negative
16	Equine	Areshak Rugaya 9685	Negative
17	Equine	Amira 42617	Negative
18	Equine	Safiyah 42618	Negative
19	Equine	Wizard 472	Negative
20	Equine	The Higgs 30192	Negative
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29	Equine	Ice Man 24273	Negative
30	Equine	Pony 24274	Negative
31	Equine	Midnight Sky 38476	Negative
32	Equine	Kira 41377	Negative
33	Equine	Grey (Never Imagined) 1535	Negative
34	Equine	Out of the Blue 29133	Negative
35	Equine	Borrasca 30617	Negative
36	Equine	Isabelle 36612	Negative
37	Equine	Pink Lady 36931	Negative
38	Equine	Mirtillo 41538	Negative
39	Equine	Shilo 34007	Negative
40	Equine	Ben 41147	Negative
41	Equine	Lumiere Lis 27861	Negative

Sample No.	Species	Sample Reference	Results
42	Equine	RK Eliseo 32214	Negative
43	Equine	Othello 35416	Negative
44	Equine	RK Crysos 35417	Negative
45	Equine	RK Sorpresa 35777	Negative
46	Equine	RK Venteux 35778	Negative
47	Equine	Moscow Magic 15586	Negative
48	Equine	Caesar PW 18958	Negative
49	Equine	Zanzibar 33791	Negative
50	Equine	Little Bits 1681	Negative
51	Equine	Molly 19767	Negative
52	Equine	Beauty 38345	Negative
53	Equine	Shafiek 40462	Negative
54	Equine	Boy George 40463	Negative
55	Equine	Sharka 40465	Negative
56	Equine	Starlight 42771	Negative
57	Equine	Holeshot Toledo 39922	Negative
58	Equine	Chaise the Tiger 39934	Negative
59	Equine	Haldago 10056	Negative
60	Equine	Ceaser 36859	Negative
61	Equine	Misty 36861	Negative
62	Equine	Pyrotec 36862	Negative
63	Equine	Meredith 36863	Negative
64	Equine	Lion 36865	Negative
65	Equine	Patches 36866	Negative
66	Equine	Lindor 36867	Negative
67	Equine	Midas 44442	Negative
68	Equine	Butterball 1797	Negative
69	Equine	Amire 1782	Negative
70	Equine	Dolce 1784	Negative
71	Equine	Duke 1785	Negative

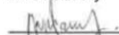| Sample No.	Species	Sample Reference	Results
72	Equine	Kariba 1786	Negative
73	Equine	Pride 1788	Negative
74	Equine	Sea Breeze 1789	Negative
75	Equine	Webster 5974	Negative
76	Equine	Jupiters Juno 40989	Negative
77	Equine	Ruby Moon 40990	Negative
78	Equine	Gandalf 1612	Negative
79	Equine	Kid Molly 1613	Negative
80	Equine	Tiekie 7159	Negative
81	Equine	Amadeus 24369	Negative
82	Equine	Skollie 29526	Negative
83	Equine	Target 39262	Negative
84	Equine	Nutmeg 1545	Negative
85	Equine	Lady da Layla 30927	Negative
86	Equine	Acapulco 37209	Negative
87	Equine	Griffin 1503	Negative
88	Equine	Storm 10149	Negative
89	Equine	Ghost 31270	Negative
90	Equine	Avatar 36932	Negative
91	Equine	Bentley 36933	Negative
92	Equine	Phoenix 42215	Negative
93	Equine	Calypso 42216	Negative
94	Equine	Dakota 44443	Negative
95	Equine	Jedi 1541	Negative
96	Equine	Ceo (Ali) 35779	Negative
97	Equine	Hunters Moon 35781	Negative
98	Equine	Sweet Dreams 1546	Negative
99	Equine	Pepper 40459	Negative
100	Equine	Angelarosa 7101	Negative

Comment:

It is recommended that the infection status of animals with test results other than negative be confirmed by repeat testing.

Disclaimer:

1. The laboratory is not responsible for sampling therefore the results apply to the sample(s) as received.
2. Any unathorised reprint or use of the report is prohibited. No part of this report may be reproduced or transmitted in any form or by any means electronic or mechanical including photocopying, recording, or by any information storage and retrieval system without express written permission from the Research Team Manager.
3. The sample submission forms as well as the BR5 and Dourine forms are available on our website (www.arc.agric.za) or from the laboratory. Please ensure you use the latest version.
4. Your feedback on our service is valuable. Please contact us with any recommendations for improvement of the anomalies on the report.

Samples(s) Submitted was/were suitable for testing
Yours Faithfully

Maria Mathekga
SANAS Technical Signatory
for Senior Manager Research: Animal Health and Protection