

# Monthly report on livestock disease trends as informally reported by veterinarians belonging to the Ruminant Veterinary Association of South Africa (RuVASA), a group of the South African Veterinary Association

## October 2018

(Previous disease reports can be seen on the RuVASA website [www.ruvasa.co.za](http://www.ruvasa.co.za) )

These reports include data from individual practices

Click on Disease Reports

The following practices and laboratories (129) submitted reports during October 2018:

### **Mpumalanga (10)**

Balfour – Dr. Louis van Jaarsveld  
Bethal – Dr. Hardus Pieters  
Grootvlei – Dr. Neels van Wyk  
Karino – Dr. Silke Pfitzer  
Lydenburg – Dr. Marietjie Malan  
Middelburg – Drs. Erasmus, Malan and Bernitz  
Nelspruit – Dr. André Beytel  
Piet Retief – Drs. Niebuhr and Weber  
Standerton – Dr. Kobie Kroon  
Volksrust – Dr. Johan Blaauw

### **Gauteng (8)**

Bapsfontein – Drs. Englbrecht and Olivier  
Bronkhorstspuit – Dr. De Bruin, De Bruin and Labuschagne  
Hammanskraal – Dr. Hentie Engelbrecht  
Magaliesburg – Dr. Ryan Jeffery  
Nigel – Dr. Cindy van der Westhuizen  
Onderstepoort Veterinary Academic Hospital – Proff. Annandale, Shakespear, Holm, Pettey and Drs, Fitte, Grobler, Hamman, Koepfel, Leask, Mabu, Marufu, Mokoetele, O'Dell, Tshuma and Van der Leek  
Pretoria – Dr. Hanneke Pienaar  
Vanderbijlpark – Dr. Kobus Kok

### **Limpopo (9)**

Bela-Bela – Dr. Nele Sabbe

Makhado (Louis Trichardt) – Drs. Harris, Klopper and Jacobs

Modimolle (Nylstroom) – Drs. Huber, Bredell and Barnard

Mokopane (Potgietersrust)- Dr. Henk Visser

Mokopane - Dr. Alwyn Venter (CCS)

Polokwane (Pietersburg) – Drs. Watson, Viljoen, Jansen van Vuuren, Van Rooyen, Snyman and Cremona

Tzaneen – ZZ2 Farm practice – Dr. Danie Odendaal

Vaalwater – Dr. Hampie van Staden

Vaalwater – Dr. Annemieke Müller

### **North West (9)**

Brits – Dr. Boshoff and Coertze

Christiana - Dr. Pieter Nel

Klerksdorp – Drs. Geral, Theron, Van den Berg and Van den Berg

Klerksdorp – Drs. Coetzee and Venter

Leeudoringstad – Dr. Ian Jonker

Lichtenburg – Dr. Nelmarie -Krüger-Rall

Stella - Dr. Magdaleen Vosser

Ventersdorp/ Koster –Drs. Benadé and Van der Merwe

Vryburg – Dr. Jurie Kritzing

### **Free State (24)**

Bethlehem – Drs. Strydom and Strydom

Bloemfontein – Dr. Stephan Wessels

Bultfontein – Dr. Santjie Pieterse

Clocolan – Drs. Wasserman and Basson

Dewetsdorp – Dr. Marike Badenhorst

Ladybrand – Drs. Dédé Nel

Ficksburg – Drs. Kotzé and Coetzer

Frankfort - Drs. Lessing, Cilliers and Janse van Rensburg

Gariiep Dam – Dr. Marni Malan

Hertzogville – Dr. Nico Hendrikz

Hoopstad – Dr. Kobus Pretorius

Kroonstad – Drs. Daffue, Eksteen, Van Zyl and Van der Walt

Memel – Drs. Nixon and Nixon

Parys – Drs. Wessels and Wessels

Philippolis – Dr. Stephan van Niekerk

Reitz - Dr. Murray Smith

Smithfield – Dr. Nienke van Hasselt

Trompsburg – Dr. Wyn Irwin

Viljoenskroon – Dr. Johan Kahts

Villiers – Drs. Hattingh and Hauptfleisch  
Vrede – Drs. Myburgh and Bester-Cloete  
Vrede – Dr. Rudolph Fourie  
Wesselsbron – Dr. Johan Jacobs  
Zastron – Drs. Troskie and Strauss

### **KwaZulu-Natal (12)**

Bergville - Dr. Ariena Shepherd  
Bergville – Dr. Jubie Muller  
Camperdown – Dr. Anthony van Tonder  
Dundee – Drs. Marais, Fynn and Reynolds  
Estcourt – Drs. Turner, Tedder, Taylor, Tratschler, Van Rooyen and Alwar  
Kokstad – Drs. Clowes and Shrives  
Mtubatuba – Dr. Trever Viljoen  
Newcastle – dr. Barry Rafferty  
Pietermaritzburg – Dr. Phillip Kretzmann  
Pongola – Dr. Heinz Kohrs  
Underberg - Drs. Collins, King and Delaney  
Vryheid – Drs. Theron and Theron

### **Eastern Cape (16)**

Alexandria - Dr. Johan Olivier  
Alexandria – Dr. Charlene Boy  
Aliwal North – Drs. Troskie and Strauss  
Bathurst – Dr. Jane Pistorius  
Cofimvaba – Dr. Werner Wentzel  
Cradock – Dr. Frans Erasmus  
Graaff- Reinet - Dr. Roland Larson  
Graaff-Reinet – Drs. Hobson, Strydon and Hennesy  
Humansdorp – Drs. Van Niekerk, Jansen Van Vuuren and Davis  
Jeffreys Bay – Drs. Lategan, Hoek and McFarlane  
Queenstown – Drs. Du Preez, Godley, Klopper, Jansen van Vuuren, De Klerk and Catherine  
Somerset East – Drs. Farrel, Louw and Ross  
Steynsburg – Dr. Johan Van Rooyen  
Stutterheim – Dr. Dave Waterman  
Uitenhage – Drs. Mulder and Krüger  
Witelsbos – Dr. Elmien Kotze

### **Western Cape (23)**

Beaufort West - Dr. Jaco Pienaar  
Caledon – Drs. Retief, Coetzer and Janssen  
Caledon – Drs. Louw and Viljoen

Ceres – Drs. Pieterse, Wium, De Villiers and Scheepers  
Darling – Drs. Van der Merwe, Adam, Lord, Jenkins and Hodgson  
George – Drs. Strydom, Truter and Pettifer  
Heidelberg – Dr. Albert van Zyl  
Malmesbury – Dr. Otto Kriek  
Malmesbury – Dr. Markus Fourie  
Malmesbury – Dr. Andries Lesch  
Malmesbury – Drs. Heyns and Zolner  
Moorreesburg – Drs. Kotzé and Sheridan Tygerbeg Animal Hospital  
Oudtshoorn – Dr. Glen Carlisle  
Oudtshoorn – Dr. Adriaan Olivier  
Piketberg – Dr. André van der Merwe  
Plettenberg Bay – Dr. André Reitz  
Riversdale – Drs. Du Plessis, Taylor and De Bruyn  
Stellenbosch – Dr. Alfred Kidd  
Swellendam – Dr. Jacques Malan  
Tulbagh/Ceres – Drs. Hamman, Wilson and Triegaardt  
Vredenburg – Dr. Izak Rust  
Wellington – Dr. Van Zyl and Louw  
Worcester – Dr. Kobus Rabe

### **Northern Cape (9)**

Calvinia – Dr. Bertus Nel  
Colesberg – Drs. Rous and Rous  
De Aar – Dr. Donald Anderson  
Kathu – Dr. Jan Vorster  
Kimberley – Drs. Van Heerden and Swart  
Kuruman – Dr. Gerhard van der Westhuizen  
Kuruman – Dr. Lea Shuda  
Postmasburg – Dr. Boeta van der Merwe  
Upington – Drs. Vorster and Visser

### **Feedlots (2)**

Drs. Morris and Du Preez  
Dr. Andy Hentzen

### **Laboratory reports (7)**

Dr. Marijke Henton - Vetdiagnostix, Johannesburg  
Dr. Liza du Plessis – Idexx SA - Johannesburg  
Dr. Last – Vetdiagnostix, Pietermaritzburg  
Dr. Sophette Gers – Pathcare, Cape Town  
Dr. Annelie Cloete - Stellenbosch

## Summary

October has been labeled by the Afrikaans poet Louis Leipoldt as the prettiest month of the year. The Jacarandas of Pretoria is proof thereof. Hopefully by the time that you read this report rain has fallen in the summer rainfall area.

Rain with a rise in temperature is also a signal for farmers to be aware of the increase in internal and external parasite numbers. Information received from veterinary practices, as depicted in the tables in this report, confirms this.

Extremely important is to check lambs, pregnant ewes and calves for signs of infestation with internal parasites i.e. pinkish eye mucous membranes, bottle jaws, diarrhoea and weight loss. Your veterinarian can also assist you by doing faecal egg counts. It is also important that an anthelmintic should be chosen which is effective as resistant worms to certain anthelmintic active groups are present on some farms. Contact your veterinarian to assist you by performing faecal egg count reduction tests.

Tick and fly numbers, as reported, are also on the increase and so are the tick transmitted diseases i.e. African red water, Asiatic red water, anaplasmosis and heartwater. As blue tick resistance is rife an effective acaricide active should be chosen. Tests can be done to help you to choose the correct active. A slight increase was seen in the occurrence of insect transmittable diseases i.e. lumpy skin disease, ephemeral fever (three-day-stiff sickness) and blue tongue. Fortunately, as yet no report of Rift Valley Fever was reported.

Venereal disease, trichomonosis and vibriosis were reported from most provinces. These diseases can cause huge economic losses to cattle farmers and biosecurity measures should always be implemented. The following bacterial diseases, for which vaccines are available, were reported: blackquarter, botulism, pulpy kidney, lamb dysentery, swelled head, red gut, blood gut, tetanus, pasteurellosis, salmonellosis, bovine brucellosis, ram's disease, leptospirosis, *E. coli* and enzootic abortion. Consult with your veterinarian what your risk is and decide on a vaccination programme.

The following viral diseases were reported: BMC (snotsiekte), rabies, BVD, IBR, rota and corona virus, EBL, orf and warts.

Protozoal diseases reported were: African- and Asiatic red water (killer disease), coccidiosis and cryptosporidiosis. Cryptosporidiosis in combination with pathogenic *E. coli*, is causing huge losses of young lambs and calves. Biosecurity measures and high quality colostrum to off spring should be pursued on all farms to prevent these losses. Discuss measures with your veterinarian.

Toxicities reported were: cardiac glycoside, gifblaar, ink berry, tulip, *Cynanchum*, *Lantana*, *Senecio*, *Acacia nilotica*, vemeersiekte, chinkerinchee, rye grass, mycotoxicosis, diplodiosis, syringa berries, water contamination, urea, snake bite, blue green algae, copper, lead, hypo and glyphosate.

Due to drought conditions numerous animals suffered from protein and energy deficiencies. Downer cows, retained afterbirths, uterine prolapses, dystocias and vitamin A deficiencies and eye problems were reported.

Lung infections in animals were reported from all provinces where dust and fluctuations in temperatures played a huge role as contributing factors.

For details of other diseases and conditions read the full report.

## **Eradication of Bovine Brucellosis (Infected herd programme basics)**

Dr.Sewellyn Davey, Brucellosis Steering Committee of the Animal Health Forum  
(sewellynd@elsenburg.com)

Bovine brucellosis is a highly contagious bacterial infection of cattle that not only causes **financial losses** but is also a **zoonosis** which means that the disease can be spread to humans either through contact with infected aborted material, calves and placentas, and consuming infected raw milk or dairy products. Once bovine brucellosis has been diagnosed on your farm it is essential that you recognise the importance of this fact and make the decision to eradicate the disease from your farm as soon as possible. As brucellosis is a controlled disease your farm will be **quarantined**. Speak to someone who has successfully eradicated the disease from their farm and together with someone who is knowledgeable about the disease draw up an eradication programme specifically designed for your farm conditions. You as a farmer and your State Vet need to work closely together to effectively eradicate bovine brucellosis from your farm. This close collaboration and action plan is needed as the management on each infected farm is different - so a "one size fits all" approach will not work. If the eradication programme is not working for you, discuss it with your State Vet and adapt the approach to make it manageable.

### **There are a few basic principles involved in eradication:**

Bovine brucellosis is a **herd disease** and should be treated as such. This is because not all infected cattle may have formed antibodies against the disease and will show as "false negatives" on blood tests. Also, the disease can have a very **variable incubation period** from 2 weeks to months, or in some rare cases even years. Heifers can be "**latent carriers**" and although infected will not show that they are positive on blood tests until they are more than 5 months pregnant or even only after calving/abortion.

Do not go into denial about the disease. By not taking rapid action you will only allow more cattle to become infected and prolong the eradication process- - every time an infected heifer or cow calves on your farm she sheds millions of bacteria that infect the environment and serve as a source of infection for other animals on the farm. Infected animals will be branded with a "**C**" **brand mark** on the right hand side of the neck to show that they are infected. Have them slaughtered under a **Red Cross permit** as soon as possible after diagnosis at an approved abattoir. Do not sell animals from a herd under

quarantine to another farmer or at an auction as these animals can cause a new outbreak of infection on another farm and you can become **liable** for the spread of the disease!

Besides the tests and the slaughter aspect of brucellosis eradication, **management** of your herd is of utmost importance. **Adult vaccination** (as well as heifer vaccination as stated in the Animal Diseases Act) can be used after discussion with your vet, to reduce the numbers of bacteria released into the environment as well as the risk of abortion, and is used as a management tool to try and prevent the spread of disease within the herd. Adult vaccination can have its own draw back so must be discussed beforehand so that an informed decision can be made about its use.

**Management** can include better observations to try and determine if a heifer/cow is about to calve/abort and remove her from the herd to an "isolation" camp as soon as possible; removing any foetal material from the pasture as soon as possible and destroying it; increasing the size of camps so the cattle density is decreased; dividing your herd size into smaller numbers to try and prevent the risk of infecting more animals than necessary; separating high risk from low risk animals; disinfection of areas; creating calving cubicles that can be easily disinfected; looking at farm topography and water ways; etc. Dairies need a very high level of management as cows in milk congregate around the milking parlour at least 2 to 3 times a day, and around water and feed troughs more frequently.

**All** female cattle and bulls over the age of 18 months must be tested by means of **serology (blood samples)**. Serological testing of cattle is essential to **identify sero-positive infected animals**. It is essential that the animals are **permanently and individually identified** so that the positive blood test can be traced back to the correct animal, and that she can be branded with a C-brand on the right-hand side of her neck to identify her as infected.

**Blood testing intervals** will differ and initially cattle may be tested every 1 to 3 months until the first negative herd test is achieved in the quarantined herd. After that, testing may be done only every 3 months until 3 negative blood tests with 3 monthly intervals have been achieved. Thereafter a blood test is repeated after 6 months and if that is negative, another test is repeated after 12 months before a herd can be declared negative for the disease and quarantine lifted. However, if at any stage during this process a herd test comes back positive (even it is 1/1000 cattle) the increased testing intervals of 1 to 3 months will again be implemented and the regimen starts from the beginning. This testing regimen is used to take the very variable incubation period into consideration, as well as potentially latent carriers. If this is not done, a "**two year breakdown**" is often encountered when brucellosis is diagnosed within the herd. This is especially true when heifer calves born from infected cows are not removed from the herd.

With the frequency of testing involved in the eradication of brucellosis, it is very important that **handling facilities** (crushes, raceways and holding pens) are well built and maintained, that the animals are **permanently and individually identified** and that infected (positive) animals are sent to **slaughter** as soon as possible to remove the source of infection on the farm.

## When buying cattle this Vendor declaration can help you to minimize risk!

### VENDOR DECLARATION BOVINE BRUCELLOSIS

I hereby declare that I am the legal owner or authorised representative of the cattle on sale and am competent to make this declaration

1	The cattle for sale are clearly and permanently identified		Yes	No
2	The cattle for sale/slaughter were born on my farm		Yes	No
3	The farm has a closed herd policy i.e. I do not buy in cattle, rent out grazing or speculate with cattle		Yes	No
4	I practice bio-security on my farm to a level that is **	Poor	Moderate	Good
5	I vaccinate my heifer calves against Bovine Brucellosis once between the ages of 4 – 8 months		Yes	No
6	In addition, I vaccinate my cattle older than 8 months with RB51		Yes	No
7	I have all the cattle on my farm tested for Bovine Brucellosis		Yes (date)	No
8	My herd has been tested negative within the past year		Yes	No
9	I did not buy in cattle since my last negative brucellosis test		Yes	No
10	I/my vet investigates any abortions on my farm		Yes	No
11	To the best of my knowledge, my immediate neighbours and farms in my area are free of Bovine Brucellosis		Yes	No
12	I use a veterinarian to advise me on my cattle's herd health		Yes	No
13	The cattle handling facilities on my farm are	Poor	Average	Good

Note: Vaccination does not mean freedom from Bovine Brucellosis as cattle can still be carriers  
Please attach the most recent *Brucella* blood test certificate



Owner or authorised representative: .....

Signature: .....

Date: .....

**\*\* \* Biosecurity**

Poor – speculates with cattle, does not vaccinate, poor fences, cattle come into contact with other cattle

Medium – Vaccinates heifers, does not buy in cattle of unknown health status

Good – closed herd/never buys in cattle, vaccinates heifers and no contact with other cattle, follows a herd health plan as advised by his veterinarian, does not allow transport trucks onto property, washes and disinfects truck after returning from the abattoir or auction grounds.

Compiled by: Dr. Sewellyn Davey, Chairman of the Brucellosis Steering committee of the National Animal Health Forum

## OVINE JOHNE'S DISEASE VENDOR DECLARATION

### ON THE SALE OF SHEEP

(Updated Draft May 2015)

- |  |            |           |
|--|------------|-----------|
| 1. I hereby declare that I am the owner or authorised representative of the sheep on sale and am competent to make this declaration.                   | <b>YES</b> | <b>NO</b> |
| 2. The sheep for sale are clearly identified in the accompanying description.  | <b>YES</b> | <b>NO</b> |
| 3. The sheep for sale were born on my farm.  | <b>YES</b> | <b>NO</b> |
| 4. The farm has a closed flock policy. (No live sheep are brought onto the farm from elsewhere)  | <b>YES</b> | <b>NO</b> |
| 5. I know the signs of the disease and to the best of my knowledge, all of my properties are free of cases of Ovine Johne's Disease.                   | <b>YES</b> | <b>NO</b> |
| 6. I have actively looked for Ovine Johne's Disease and have had tests done for this.  | <b>YES</b> | <b>NO</b> |
| 7. To the best of my knowledge, my immediate neighbours and farms in my magisterial district of my farm(s) are free of cases of Ovine Johne's Disease. | <b>YES</b> | <b>NO</b> |

8. The sheep on my properties have been vaccinated against Ovine Johne's Disease and are clearly marked with the approved ear tag.	<b>YES</b>	<b>NO</b>
9. All lambs born are vaccinated	<b>YES</b>	<b>NO</b>
10. If vaccinated, the number of years that the vaccinations have been done is		years
<b>NOTE:</b> Vaccination does not mean freedom from OJD, vaccinated animals can still be carriers. Statement 8 and 9 apply only to already infected flocks, and such sheep can only be sold to other infected flocks by law. Buyers should consult their veterinary advisor before any purchases.		

Signature \_\_\_\_\_

Date \_\_\_\_\_

NAME \_\_\_\_\_

Farm: \_\_\_\_\_

District: \_\_\_\_\_

OWNER OR AUTHORIZED REPRESENTATIVE

The use of this declaration is supported by the following organisations:



# SOP for the control of Bovine Brucellosis

Audit date: \_\_\_\_\_

Authorised person: \_\_\_\_\_

		Y/N	Comment
1	Fences and gates in good condition		
2	Gate control - log in		
3	Disinfection of vehicles coming onto the farm		
4	Protective clothing and boots given to people visiting the farm (cattle area) coming from high risk areas eg. veterinarians, nutritionists, representatives, truck drivers, workers, etc.		
5	Sterilizing equipment coming in contact with cattle		
6	Run off water/ streams from neighbouring farms		
7	All animals identified with a brand mark and ear tag		
8	Data base of all animals		
9	Closed herd		
10	When last were animals bought in or moved from another farm?		
11	Only buy in animals from a farm which has a recent negative tested brucellosis herd certificate		
12	Origin(s) of acquired cattle? Bought at an auction?		
13	Keep heifers separate from herd until they have calved and tested negative for brucellosis		
14	Quarantine camp available		
15	Separate calving camps		
16	Were all heifers vaccinated between 4 and 8 months vaccinated with Strain 19 or RB51?		
17	Any cattle vaccinated with Strain 19 over 8 months of age? History over last few years.		
18	Were there any abortions on the farm – samples taken, diagnosis?		
19	All sexually mature cattle in herd tested for bovine brucellosis (provide proof)		

20	Bovine brucellosis is a State controlled disease. Positive cattle are branded with a C on the right side of the neck.		
21	Isolation of infected animals & separate handling facilities		
22	Prohibition of movement of animals off quarantined property except under cover of a Red cross permit for slaughter at an abattoir		
23	Prohibition of use and on-farm disposal of unboiled, unpasteurised or unsterilised milk on quarantined property		
24	Disinfection of places where infection is a possibility.		
25	Neighbours/ recent buyers informed of infected herd status		
26	Fly, crow and predator control		
27	Destruction of afterbirths/abortions in a responsible manner		
28	Beware of livestock, game interface		

**Websites that are there to help you with information regarding animal health:**

## **National Animal Health Forum**

[www.nahf.co.za](http://www.nahf.co.za)

Read what the Forum is all about:

<http://nahf.co.za/about/>

This website will become the information centre of animal health in Southern Africa.

On the toolbar click on **Stakeholders** and you will find links to producer organizations and other organizations who are participating in the NAHF

<http://nahf.co.za/stakeholders/>

Provincial Animal Health Forums have their own site – click on **Provinces** <http://nahf.co.za/provinces/>

Important is to study the Veterinary Strategy (2016 -2026) as it gives direction to where we are going with Animal Health in South Africa.

<http://nahf.co.za/wp-content/uploads/Vet-strategy-final-signed.pdf>

Click on **Info centre** for more information on the “war” we have against Bovine Brucellosis. Please be up to date on the role all have to play to control this zoonotic disease.

<http://nahf.co.za/category/diseases/brucellosis/>

Information on other controlled diseases (Ovine Johne's Disease, Pest of small stock – PPR, and African Horse Sickness) is available.

This link will continuously be updated.

Information on **antibiotic resistance** is also available at this address:

<http://nahf.co.za/category/antibiotic-resistance/>

## Rural Veterinary Association of South Africa

[www.ruvasa.co.za](http://www.ruvasa.co.za)

Click on **Disease reporting** where maps and information can be sourced on the prevalence of diseases in all provinces. Abattoir reports are available. Use the information available to update management programmes

## Landbouweekblad's webpage

[www.landbou.com](http://www.landbou.com)

[Vra vir Faffa](#)

Click on: **Indeks van antwoorde** where more than 4 000 answers can be sourced on animal health.

Click on Beeste

Click on Siektes

Click on Brusellose

Stop Brusellose

Gevaar om Beesbrusellose (BBR) deur vendusies en skoue te versprei

Rapportering aan bure of ander eienaars oor die voorkoms van brusellose

Inligting oor brusellose op die NAHF se webblad

Kuddebestuur voor die dekseisoen

Bees Brusellose handleiding

Teenliggaamwaardes om beesbrusellose in koeie te bepaal

Veterinêre Strategie 2016 -2026

'n Dosyn dinge wat jy moet weet van beesbrusellose

Vyf kernfeite wat jy van beesbrusellose (Besmetlike misgeboorte – BM) behoort te weet

Veiligheid van vleis en biltong afkomstig van 'n bees met brusellose

Vervoer van diere uit 'n positiewe brusellose kudde

Beheer van brusellose in 'n beeskudde

Boerderypraktyke wat die gevaar van die voorkoms van brusellose verhoog



Resistant roundworms	X				X				
Wireworm	X	X			X	X	X	X	
Brown stomach-worm							X		
Long-necked bankruptworm									
Large-mouthed bowelworm									
Nodularworm									X
Lungworm									
Eyeworm			X	X	X		X		
<i>Parafilaria</i>		X				X			
Tapeworms	X	X	X	X	X	X	X		X
Liver fluke	X	X	X	X				X	
Conical fluke	X				X	X	X	X	
Cysticercosis (measles)	X		X					X	
Schistosomiasis (bilharzia)									
Coccidiosis	X	X		X	X	X	X	X	X
Cryptosporidiosis	X			X	X	X	X	X	

Early rain fell in many parts of South Africa. Use the five point check to keep on top of what is happening in the flock. For further detail contact your local veterinarian.

<http://hulp.landbou.com/kundiges/vra-vir-faffa/vyfpuntplan-en-famacha-stelsel-vir-inwendige-parasietbestuur-in-skape/>

[https://docs.wixstatic.com/ugd/aded98\\_cb447e77eef6450f93a2b23cb0e6b9de.pdf](https://docs.wixstatic.com/ugd/aded98_cb447e77eef6450f93a2b23cb0e6b9de.pdf)

### Prevention of Cryptosporidiosis

- Since there is no vaccine or registered treatment for Cryptosporidium, prevention is the best control method. Animals with a good immune system will generally easily overcome Cryptosporidium, thus this must be the main aim in controlling Cryptosporidium.

- A consistent, vet approved and farm appropriate vaccination program for other diseases.
- Ensure no nutritional deficiencies especially vitamin A and Selenium
- Excellent bio-security
- Ensure clean water sources

## External parasites

The following reports were received from practices regarding external parasite infestations:

External parasites	MP	G	L	NW	FS	KZN	EC	WC	NC
Blue ticks	X		X	X	X	X	X	X	
Resistant blue ticks								X	
Heartwater ticks	X	X	X		X	X	X		
Brown ear-ticks	X	X		X	X	X			
Bont-legged ticks	X	X		X	X	X			X
Red-legged ticks	X			X	X	X		X	X
Paralysis ticks					X	X	X		
Tampans									
Biting lice				X	X	X			
Sucking lice					X		X		X
Itch mites									
Sheep scab		X					X		X
Mange mites	X	X		X	X	X			
Nuisance flies	X			X	X	X		X	
Midges	X				X		X	X	
Mosquitoes				X	X				
Blowflies					X	X		X	



Screw-worm	X					X			
Gedoeelstia (uitpeuloogsiekte)									
Nasal bot		X			X	X			X

Blue tick infestations were reported from most provinces. Blue ticks (African and Asiatic blue ticks) are able to transmit red water, anaplasmosis and lumpy skin disease.

Make sure to assess the blue tick resistance status on your farm before buying tickicides. Your veterinarian will be able to collect engorged blue ticks to be tested for resistance.

Actives to be tested for resistance are: organophosphates, pyrethroids, amidines, fipronil. Actives registered only for controlling blue ticks are: macrocyclic lactones, fluzuron (acaracide growth regulator).

Discuss your tick control programme with your veterinarian as controlling ticks early in spring can prevent large outbreaks of ticks in the summer.

Below is a list of diseases transmitted by ticks.

## Tick borne diseases

The following tick-borne diseases were reported by practices in the provinces:

Tick borne diseases	MP	G	L	NW	FS	KZN	EC	WC	NC
African red water	X	X	X		X	X	X	X	
Asiatic red water	X	X	X	X	X	X	X	X	
Anaplasmosis	X	X	X	X	X	X	X	X	
Heartwater	X	X	X			X	X		
Lumpy skin disease	X				X	X		X	
Corridor disease									
Theileriosis				X					

Asiatic red water is spreading and is one of the deadliest diseases in cattle.

Numerous mortalities were reported!

The keyword is **vaccinate** your animals! Contact your veterinarian.

Anaplasmosis outbreaks were reported in 5 provinces. Biting flies are probably the main spreader of this disease!

The following tick toxicosis was reported by practices in the provinces:

Tick toxicosis	MP	G	L	NW	FS	KZN	EC	WC	NC
Sweating sickness		x		x	x			x	x

This disease is caused by the toxin of the bont legged-tick.

## Insect transmittable diseases

The following insect transmittable diseases were reported by practices in the provinces:

Insect transmittable diseases	MP	G	L	NW	FS	KZN	EC	WC	NC
Lumpy skin disease	x				x	x		x	
Ephemeral fever (Three-day-stiff sickness)	x					x		x	
Blue tongue		x					x	x	
Rift Valley Fever									
Wesselsbron									
Nagana						x			

As soon as insect populations increase with warmer weather conditions, **unvaccinated** animals with a lack of immunity to insect transmittable diseases, will be the target of these diseases.

**Have you vaccinated your animals against Rift Valley Fever?**

**From experience I can tell you that when outbreaks of diseases occur, vaccines will be difficult to acquire as many people will be ordering vaccines all at once.**

## Veneral diseases

The following venereal diseases were reported by practices in the provinces:









Gifblaar	X	X							
Gousiekte									
<i>Cestrum</i> (ink berry)					X		X		
Tulip	X	X		X	X	X	X	X	
<i>Cynanchum</i> (bobbejaantou)								X	
Facial eczema								X	
<i>Lantana</i>	X			X		X	X		
Prussic acid								X	
<i>Acacia nilotica</i>		X							
<i>Senecio</i>						X	X		
<i>Cotula nigellifolia</i> (stagger wood)									
Geeldikkop (duwweltjies) and dikoor									
Vermeersiekte	X								
<i>Hertia pallens</i> (Nenta, krimpsiekte)									
<i>Chrysocoma ciliata</i> (bitterbos)									
<i>Solanum incanum</i> (maldronksiekte)									
<i>Gomphocarpus (Asclepias) fruticosus</i> (milkweed)									
Bracken fern									
January bush ( <i>Gnidia polycephalatus</i> )									
Chinkerinchee								X	
Ceylons rose									
Eucalyptus (bloekom) bark									
Kikuyu									
Ryegrass						X		X	







Monensin									
Hypo								x	
Diazinon									
Glyphosate					x				
Chicken litter									

Beware when buying in animals or moving them into rested grazing camps as they are the animals which usually eat toxic plants such as tulp and ink berries (*Cestrum*).

Do have activated charcoal on the farm as the antidote for tulip poisoning! **Seven provinces reported tulip toxicity!**

Toxic plants are sometimes eaten by young animals that do not know these plants. Be aware of this situation and know where these plants are growing on the farm.

For further information on treatment of tulp and other toxicities visit:

[www.landbou.com](http://www.landbou.com)

Vra vir Faffa

Klik op Indeks van antwoorde

Klik op Beeste of Skape

Klik op Vergiftigings

Klik op die Opskrifte

Every month there are reports of urea poisoning. Be aware when feeding this product that the correct concentration is used and that the lick does not get wet!

A few cases of Lantana-poisoning were reported.

Research are being done to control Lantana:

We would like to investigate involvement of your readers and yourself in the development of a National Programme for Management of Lantana similar to the attached National Programme for Management of Parthenium. Our focus would be on the biological control of the species, however, farmers, landowners and communities would be interested in an integrated approach to the management of the species. Please do bear in mind that the rust-fungus will unfortunately not be a 'silver-bullet' as it is likely to impact some subspecies more than others and work better in some micro-climates than others..

Please can we consider how your readers would be able to contribute to the development of a National Programme? One element would be accurate mapping of the distribution of Lantana. If readers could be encouraged to report locations of Lantana then a more comprehensive map of its distribution would be feasible (we need to make sure that this is done in a co-ordinated fashion and using technology that allows for accuracy and ease of data collection (smart phone application to geographically referenced database – which would need to be set up and managed).

Encouraging readers to give input into a National Programme would result in greater support for its implementation. We would need to make sure that this is not too tedious a process.

Encouraging readers to be aware of the biological control agents that are out there already would also be useful. Again this could be reported using photographs and submitting these to a central database.

It would also be good if we could have landowners who would be willing to have 'biological control reserves' on their property. This would mean setting aside land that is infested by Lantana and ensuring that it is not cleared for any reason. The biological control agents would then be allowed to multiply in this area under the 'protection' of the landowner.

I write on behalf of Biological Control researchers at the Agricultural Research Council – Plant Protection Research Institute and at the Centre for Biological Control at Rhodes University.

<http://www.ru.ac.za/centreforbiologicalcontrol/>

Philip Ivey [<mailto:P.Ivey@ru.ac.za>]

## Nutritional deficiencies

The following nutritional deficiencies were reported by practices in the provinces:

Deficiencies	MP	G	L	NW	FS	KZN	EC	WC	NC
Energy	X	X	X	X	X	X	X	X	X
Protein	X	X	X	X	X	X	X	X	X
Phosphate				X					X
Calcium	X		X		X	X		X	

**Nutritional deficiencies were reported. It is important that ewes and cows receive sufficient supplementation so as to have optimal colostrum quality for their offspring!**







Vaginal prolaps	X	X	X	X	X	X	X	X	
Penis injury									
Orchitis									

A poor conception rate on many farms is a huge issue. Visit your veterinarian to rectify this problem.

## Environmental conditions

	MP	G	L	NW	FS	KZN	EC	WC	NC
Exposure to cold						X			
Frozen to death					X				
Heat stress					X			X	
Lightning	X				X	X			
Electrocution									
Drought							X		X

## Other conditions

	MP	G	L	NW	FS	KZN	EC	WC	NC
Drug residues (milk, meat, liver, kidney etc)									
Preditors		X			X	X	X	X	
Theft					X	X			
Trauma (fractures etc)	X	X	X		X		X	X	
Trauma (veldfires)	X				X				

In the CODE OF CONDUCT of the RPO the following standard operating procedures are documented. The local veterinarian should be your partner to help you achieve the necessary standards.

<http://www.rpo.co.za/BestPractices/English.aspx>

## **PRECAUTIONARY MEASURES TO SUPPORT BIO-SECURITY.**

Precautionary measures are required to protect the herd against diseases acquired because of external contact. The following categories are of concern:

### **1. DIRECT LIVESTOCK PURCHASES (and own animals returning):**

The following should be *verified* before importing new animals into the herd:

How long animals have resided at the purchase or previous location?

Have there been any recent disease outbreaks in the location?

Do brand marks clearly confirm ownership?

Was a vaccination program followed (need paper or veterinarian proof). What are the local prevalent external parasites and the routinely implemented control program?

Is a veterinarian supported control program against transmittable diseases followed?

Dates and sufficient number of tests for reproductive diseases of both male and female

Dates and tests for zoonotic diseases

The above should also be verified with the purchaser's own veterinarian.

### **2. PURCHASES FROM SALES OR SPECULATORS**

Purchase only in areas which are not in close proximity to scheduled areas

Visually inspect the animals before purchasing for:

\* brand marks

\* parasite infestation

### **3. TRANSPORT TO THE FARM**

Use only reputable transporters

Has the truck been cleaned and disinfected?

Truck to follow the shortest uninterrupted route

Truck to take the shortest route to the handling facilities

Do not allow the truck personnel to get in contact with the farm herd

### **4. ARRIVAL ON THE FARM**

Off-load the livestock to limit stress and to be visually evaluated for any unnatural conditions.

Isolate them from the farm herd and shared facilities for at least 21 days (quarantine)

Retest for diseases of concern if needed, before mixing with the rest of the herd

Process new arrivals within 24 hrs after arrival (unique ID tag brand, dip, dose, vaccinate)

Inspect regularly

### **5. FEED PURCHASES**

Ensure bales of hay are sourced from areas that are not bordering scheduled areas

Purchase feed from reputable dealers only

Avoid buying feed in second hand bags

Ensure feed trucks are also disinfected and cleaned, especially if also used to transport animals to abattoirs

### **6. VISITORS**

Do not allow strangers or their vehicles amongst the livestock

Ensure fences are well maintained and preferably jackal and warthog proof



## **7. EMPLOYEES**

Do not allow the employees to eat in feed stores

Supply employees with sufficient ablution facilities

Regularly arrange to let employees be medicated for tape worm and have health check-ups

Keep record of all employee livestock on the property

Treat employee livestock with separate but dedicated health programs

Ensure employees understand the reason behind the implemented bio-security measures to help ensure compliance.

## **GENERAL AND REPRODUCTION MANAGEMENT**

Record keeping: All animals are individually identified and recorded.

To prove ownership: All animals are marked with the registered brand mark according to the Animal Identification Act, No 6 of 2002.

A defined breeding season is the basis of effective management: The breeding season coincides with the rainy season, i.e. the period when nutritive value of the pasture is at its best.

Sufficient energy reserves in the herd as measured by condition scoring are vital, especially for effective breeding, and when inadequate the herd is supplemented in consultation with a nutritionist: Condition scoring of bulls and cows are regularly done, particularly at the onset of the breeding season and supplemented if necessary.

Bull - cow ratios are maintained: A ratio of 1 to 25 is maintained in every separate herd.

Fertility of breeding bulls: All breeding bulls are tested for mating ability and semen quality before the breeding season.

Sexually transferable diseases: Sheath washes or scrapes on bulls are performed annually.

Diseases that can cause poor conception, abortion or weak calves: Cows are vaccinated against such diseases in consultation with the veterinarian.

Breeding success monitored by a veterinarian: Rectal pregnancy or scan diagnosis is done by the veterinarian 8 weeks after the breeding season.

Twenty percent of cows or more not pregnant: Further tests are done to determine cause of low pregnancy rate.

Culling of non-pregnant cows: Non-pregnant cows are removed from the herd and considered a necessary bonus to supporting herd income.

## **HERD HEALTH AND BIO-SECURITY**

Maintenance of herd health is key to a successful enterprise: A veterinarian should visit the farm bi-annually at least.

Calf mortality before 3 months of age is an important reason for poor weaning percentage: Good management practices are applied to limit early calf deaths.

Some diseases and parasites (internal and external) are more often encountered in specific areas:

Annual vaccinations and a parasite control program should be applied according to regional requirements and in liaison with the veterinarian.

Farmers selling weaned calves to feedlots may want to have a market advantage compared to others: A specific vaccination program is applied before weaning for that purpose.

Herds may be at risk of being exposed to CA and TB: The herd is tested annually for CA and all heifers are vaccinated against CA between 4 and 8 months of age with an efficient, approved remedy. The herd is tested at least every 5 years for TB

Precautionary measures are required to prevent diseases being imported into the herd: A quarantine program to keep incoming animals separate is followed. All incoming animals have a suitable certificate of negative test results or are of a certified clean, closed herd.

Stock remedies and medicines should be registered, correctly stored and used before the transpire date:

All medicines and stock remedies are registered, stored and applied according to prescription.

Prescribed medicines with a specific application are under the control of the veterinary profession: All prescription medicines are obtained and applied under prescription from a veterinarian.

## Practices that had nothing to report

Cape Town – Sophette Gers

Mokopane – Dr. Alwyn Venter (SV)

Stutterheim – Dr. Dave Waterman

Tulbagh – Dr. Dirk Trigaardt

Vaalwater – Dr. Annemieke Müller

Vanderbijlpark – Dr. Kobus Kok

## Ostriches

### Western Cape

#### Oudtshoorn

Yolk sack infection	Start of the new season, acute mortalities (low incidence). Septicaemia/ toxaemia, <i>E. coli</i>
Diarrhoea	Starts with overgrowth of normal bacteria following a trigger stress situation. If treated too late or with hard antibiotics, rapidly develop chronic diarrhoea, due to resistant <i>E. coli</i> . Prognosis poor.
Avian influenza	High prevalence of wild bird interactions following short good rains – mostly pastures. Spuwing geese, Egyptian geese and blue cranes. Not H5 or H7. Seems like a H6 and H9. Cold weather with stress increases susceptibility.
Eye and lung infection	Cold stress weather/ wind, dust confinement to protect birds from poor weather results in air sacculitis and conjunctivitis (with low vitamin A and E during winter contributes)
Clostridial enterotoxaemia	Changing weather results in over eating after bad spell causing clostridial overgrowth.

Low conception	High % infertile/ high male ration with severe climatic fluctuations 40 degrees Celsius for week, drop to 14 degrees Celsius results in many early embryo deaths.
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## Equines

### Limpopo

#### Makhado

African Horse sickness – 3 cases

#### Modimolle

Fever – Unknown origin, improved after treatment

Urethra obstruction – caused by miasis (fly larvae)

### Free State

#### Bethlehem

Colic - 2

#### Dewetsdorp

Internal parasites – 3 foals

#### Parys

Ophthalmia - 3

### Western Cape

#### Darling

Midges – 1

Nuisance flies - 1

## Game

### Gauteng

#### Pretoria

Bont tick – 2

Blackquarter – 1

Coccidiosis – 1

Lameness – 1

Ophthalmia – 2 *Moraxella*

### Limpopo

#### Makhado

Red gut – 1 Roan

### Bela-bela

Anaemia – 1 Sable died, probably wireworm

Snare – 1 Nyala, snare around neck

Hair loss (mites?) – 9 Sable out of one camp. Antiparasitic treatment given and minerals in water trough. Recovered, only one small buck still with hairloss.

Enteritis – 1 Waterbuck bull. Bloody from anus. Died, at necropsy sever enteritis. Only 2 days on farm.

### **North West**

#### **Klerksdorp**

Bont-legged ticks - 3

#### **Lichtenburg**

Rabies – Two jackals

## **Swine**

### **Gauteng**

#### **Pretoria**

Fractures – 1

Biting lice – 1

### **KwaZulu-Natal**

#### **Bergville**

Intestinal roundworms - 2

## **Monthly report on Livestock and Wildlife isolations for October 2018 from Vetdiagnostix –Microbiology Laboratory, supplied by dr. Marijke Henton ([henton@vetdx.co.za](mailto:henton@vetdx.co.za))**

October was a relatively quiet month.

Clostridial myositis cases differed somewhat from the usual this month. There were three cases of *Clostridium chauvoei* and no other cases. Because most farmers vaccinate against *C. chauvoei* even if they neglect other vaccinations, it is rare to receive exclusively *C. chauvoei* samples.

There is a prevalent misconception that the FA test also detects *Clostridium perfringens*. *C. perfringens* can sometimes also cause myositis, but it is rare. The FA test is for muscle samples, not for intestinal samples.

An unusual case of myositis and ventral oedema in goats was negative on the FA test, but was due to the vaccine strain of anthrax. It is difficult to clear multidose injectors of vaccine spores. Spores survive most cleaning procedures. This is not a problem for most of our farm animals, as a few extra vaccine spores just boost their immunity. Goats are exquisitely sensitive to the anthrax vaccine strain, and if some spores are present, particularly when an oily preparation is being administered, goats show marked oedema near the site of vaccination, which can result in death. The oil or other components act as adjuvants, exacerbating the reaction.

*Salmonella* Dublin was isolated from two outbreaks in cattle, where vaccination was not done. Cattle can carry *Salmonella* Dublin all their lives, and only excrete it from time to time, making it difficult to detect. The carrier animals act as a source of infection.

Other bovine infections were pneumonia [*Mannheimia haemolytica*, *Pasteurella multocida* and two cases of *Trueperella pyogenes*]. *Trueperella pyogenes* was also associated with two cases of abortion and one of abscessation. *Brucella abortus* was isolated from a foetus originating from a speculator's farm.

Enteritis was associated with *E. coli* [calves 17, lambs 2] and *Cryptosporidium* [4 calves]. Bovine *Clostridium perfringens* enteritis was present on two farms.

Pneumonia in pigs was due to *Actinobacillus pleuropneumoniae* in two cases, one of which typed as type 2, as well as one case each of *Bordetella bronchiseptica*, *Staphylococcus aureus*, *Klebsiella pneumoniae* and *Streptococcus suis*. *E. coli* was associated with enteritis [2] and septicaemia [1]. *Streptococcus porcicus* was isolated from a case of vaginitis.

Wildlife isolates were *Streptococcus canis* from a cheetah's nasal discharge, and osteomyelitis after a wound infection in a rhino yielded combined *Trueperella pyogenes* and the anaerobe, *Porphyromonas*.

Maryke Henton, Vetdiagnostix.

**Feedlot report received from Drs. Shaun Morris and Eben du Preez for October 2018 ([edupreez1@telkomsa.net](mailto:edupreez1@telkomsa.net))**

Condition	Comments and Specie
Intestinal roundworms	O 3, C 3
Tapeworms	O 2
Liver fluke	B 3
<i>Parafilaria</i>	B 3
Cysticercosis (measles)	B 3
Blue ticks	B 3
Heartwater tick	B 1
Brown ear-tick	B 3
Heartwater tick	B 3
Bont- legged tick	B 3

Red-legged tick	B3, O 3
Biting lice	B 2
Blow flies	O 2
Asiatic red water	B 2
Anaplasmosis	B 3
Heartwater	B 2, C 1
Lumpy skin disease	B 3
Blackleg	B 1
Swelled head	B2, O 1
Red gut	B 3
Blood gut	O 3
Pulpy kidney	O 3
Salmonellosis	B 1
<i>E. coli</i>	B 3, O 3
Coccidiosis	O 1
Cryptosporidiosis	B 3, O 2
Ringworm	B 3
IBR	B 1
Warts	B 3
Protein deficiency	B 3
Energy deficiency	B3, O 3
Phosphate deficiency	B 3
Selenium	O 1
Vitamin A deficiency	B 3, O 3

Inkberry poisoning	B 3
Dystocia	B 2
Retained afterbirths	B 1
Abscesses	B 3, O 3
Eye infection	B 3, O 3
Lameness	B 3
Lungs	B3, O 3
Diarrhoea	B 3, O 3
Pericarditis	B 3, O 1
Trauma	B 3, O 3
Heat stroke	B 2
Farmers reporting	Acidosis B3 Urolithiasis 2 Bulls, 2 rams

**Feedlot report received from Dr. Andy Hentzen October 2018**  
[andyvet@mweb.co.za](mailto:andyvet@mweb.co.za)

Condition	Comments and Specie
Tapeworms	B 3
Liver fluke	B 3
Conical fluke	B 1
<i>Parafilaria</i>	B 2
Cysticercosis (measles)	B 2

Blue ticks	B 2
Red-legged tick	B 2
Biting lice	B 2
Sucking lice	B 2
Blow flies	B 1
African red water	B 1
Anaplasmosis	B 1
Red gut	B 3
Leptospirosis	B 1
<i>E. coli</i>	B 1
Ringworm	B 3
IBR	B 3
BVD	B 2
EBL	B 1
Warts	B 3
Tulip toxicity	B 2
Water contamination	B 3
Protein deficiency	B 3
Energy deficiency	B 3
Micro-mineral deficiencies	B 3
Abortion	B 3
Dystocia	B 3
Mastitis	B 1
Eye infection	B 3



Lameness	B 3
Lungs	B 3
Abscesses	B , C 3
Diarrhoea	B 3

## Monthly report for October 2018 from Dr R D Last (BVSc; M.Med.Vet(Path); MRCVS)

Specialist Veterinary Pathologist, Vetdiagnostix - Veterinary Pathology Services

LIVESTOCK DISEASE SURVEILLANCE			
LIVESTOCK SPECIES	DISEASE AGENT	NO. CASES	LOCATION
Bovine, Heifer Calf	Cotula (Matricaria) nigellifolia - Stootsiekte	1	Howick, KZN
Bovine, Jersey Cow 7 yrs	Retrobulbar lymphoma - EBL	1	Underberg, KZN
Bovine, Feedlot Weaner	Sporadic Bovine Leukosis	1	Heidelberg, Gauteng

WILDLIFE DISEASE SURVEILLANCE			
WILDLIFE SPECIES	DISEASE AGENT	NO. CASES	LOCATION
Lion, Adult Male	Cholangiocellular carcinoma + pulmonary metastasis	1	Rustenburg, North West
Buffalo, Adult Cow	Babesiosis	1	Hoedspruit, Limpopo
Sable, Adult Bull	Babesiosis	1	Thabazimbi, Limpopo
Zebra, Adults	Transport tetany	1	Kenya
Buffalo, Adult cow	Fibropapilloma (sarcoïd)	1	Thabazimbi, Limpopo
White Rhino, Adult Female	Heartpluck (visceral) clostridial myositis	1	Krugersdorp, Gauteng
Mangabey Monkey, Adult	Hepatic echinococcosis	1	Lammermoor, Gauteng

**Monthly report on Livestock and Wildlife isolations for October 2018 from IDEXX Laboratories supplied by dr. Liza du Plessis ([Liza-DuPlessis@idexx.com](mailto:Liza-DuPlessis@idexx.com))**

Condition	Comments and Specie
Blue ticks	E 1
Bont tick	B, G 1
Brown ear ticks	E 1
Red -legged ticks	E 1
Black leg	B 1
Salmonellosis	B, G 1
Coccidiosis	O 1
Cryptosporidiosis	O 1
Bacterial enteritis (diarrhoea)	B, O 1
Bovine malignant catharr (snotsiekte)	B 2
IBR	B 3
Equine sarcoid	E 1
Navell ill	B 2
Lungs	B 1
Abortion	B 3, O 1, C 1
Tulip toxicity	B 2
Senecio toxicity	O 1



Section of Pathology  
Department of Paraclinical Sciences  
Faculty of Veterinary Science

1<sup>st</sup> November 2018

DAFF

Import/Export Policy Unit Subdirector

**Monthly report: Faculty of Veterinary Science cases**

**Cases sent to referring veterinarians between 2<sup>nd</sup> October and 1<sup>st</sup> November 2018**

Cases from State vet Skukuza or Orpen

Cases imported with master permit (none)

PMDate	Species	Final	Histo No
19-Sep-18	Hippopotamus	Normal tissues (TB monitoring)	S3236-18
19-Sep-18	African Elephant	Suspected tuberculosis	S3237-18
20-Sep-18	African buffalo	Water deprivation	S3240-18
25-Sep-18	Lion	Subcutaneous fibrolipoma	S3303-18
27-Sep-18	Cheetah	Suspected lead toxicity	S3364-18
03-Oct-18	African Elephant	Normal tissues (TB monitoring)	S3390-18
03-Oct-18	Hippopotamus	Normal tissues (TB monitoring)	S3391-18
05-Oct-18	Lion	Granulosa cell tumours, leiomyomas, cystic endometrial hyperplasia	S3435-18

Kind regards,

A handwritten signature in blue ink that reads 'Emily Mitchell'.

Prof. Emily Mitchell