The African buffalo

- Charismatic status
- Dangerous
- Desirable subject for hunting
- When a disease free status can be maintained, they are a lucrative investment
- Carrier of over 50 different diseases & parasites
- They are susceptible to most cattle diseases
Remarkable turn-about

- Twenty years ago the African buffalo was seen as an undesirable source of infection for cattle and not as a valuable asset.
- The development and emphasis of a disease free status has completely turned this situation around.
- The current high value and demand for buffalo when compared to cattle suddenly put cattle in a different perspective.
- Cattle are now a bigger risk to high value buffalo due to the increase of tuberculosis and contagious abortion in cattle population in SA.

South African Buffalo classification

- Original Addo breeding stock = disease free
  - This population provided the original disease free breeding stock in South Africa.
- Corridor Disease infected buffaloes from Kwa-Zulu Natal
  - Populations in HIP is also infected with Bovine Tuberculosis but populations on private land are still BTB free.
- Foot and Mouth Disease infected buffaloes from Kruger National Park Complex
  - This population is also infected with CD, BTB & Brucellosis.
- Disease free buffaloes from origins outside South Africa.
  - East African buffalo.
Population size & distribution

- The Kruger National Park Complex has in excess of 44,000 Foot and Mouth Disease infected buffaloes and the population is still growing.
- Then there are 27,000 disease-free buffaloes of which 5,000 occur in other national parks and provincial reserves.
- Twenty-two thousand occur on 2,400 private registered buffalo properties all over the country of which 12,500 disease-free buffaloes occur in Limpopo.

Disease Categories

- Indigenous Diseases
  - Buffaloes mostly not affected but carriers and/or serologically positive. Infectious Diseases of Africa
- Exotic Diseases
  - Infectious diseases from other continents. Buffaloes develop clinical disease and may succumb.
- Universal Multispecies Diseases
  - Infectious diseases that occur worldwide in multiple species.
- Diseases associated with management
  - These are not necessarily of infectious nature.
The Four Key Buffalo Diseases

- **Foot and Mouth Disease**
  - Indigenous infectious disease
- **Corridor Disease**
  - Indigenous infectious disease
- **Bovine Tuberculosis**
  - Exotic infectious disease
- **Contagious Abortion caused by Brucella abortus**
  - Exotic infectious disease
- These are State Controlled Diseases and the presence or absence of any of these Key Diseases will determine the buffalo’s location and future

Foot and Mouth Disease

- This group of viruses is permanently maintained by and cycling in most large and/or contiguous buffalo populations in Africa and is extremely infectious
- Negative populations such as Addo & Hluhluwe-Imfolozi lost their infection when their founder populations were isolated after the Rinderpest pandemic
- All African buffaloes are equally susceptible to all FMD viruses irrespective of the buffalo’s origin
- African buffalo could also to be able to maintain FMD viruses from other continents (O, A, C & Asia 1)
Foot and Mouth Disease

- Once exposed > permanently infected
- Buffalo very seldom show clinical signs of disease
- Various SAT types are constantly mutating and cycling in large infected buffalo populations
- Small and isolated populations may loose their infection over generations due to the absence of new exposures
- Any introduction of a new virus mutation type will lead to a high incidence over a relatively short period of time
- The larger the herd the more intense will transmission be experienced. Close contact required.

FMD Continue

- Buffalo calves suckling from previously infected cows will obtain maternal immunity which will be reflected in the results of serological tests
- This maternal immunity starts waning between 6 and 9 months of age
- The buffalo calf is then fully susceptible to real infection with FMD virus
- However if there is zero active & virulent (or new) FMD virus cycling in the herd the calf could stay negative indefinitely
- The moment the herd gets exposed to a new virus, all naïve calves will become infected
- Another probability is that a previously infected carrier animal may start secreting virus again infecting all the new calves
How can infection spread?

- Movement of infected buffalo
  - Vagrant or illegal translocation
- Movement of infected cloven-hoofed wildlife
  - Vagrant or illegal translocation
- Movement of infected cloven-hoofed livestock
  - Illegal or legal within the control zones
- Human mechanical transmission – 5 day isolation after working with infected or potentially infected animals
  - Virus stays viable in the naso-and oropharynx
- Contamination of environment and equipment and bedding not a factor in Africa

Consequences of FMD infection in the free zone

- Destruction of infected herd
- Cordon off on a radius of 10 km from the edge of the infected area
- Movement control of cloven-hoofed animals
- Termination of agricultural exports

- Always but always deal with reputable breeders
- Through the process of DNA nucleotide sequencing (“fingerprinting”) can the exact origin of an isolated virus be determined
Why is buffalo seen as such a high risk?

- Impossible to distinguish between and FMD and Disease free buffalo
- Cattle and buffalo are equally susceptible to FMD virus
- Both buffalo and cattle excrete high quantities of FMD virus after infection but cattle seldom become carriers
- The increasing monetary value of buffalo could lead to illegal translocations
Bovine Tuberculosis

- Historically alien to Sub-Saharan Africa
- Imported through domestic cattle during early colonization
- Buffalo very susceptible & ideal maintenance hosts
- They are bovids and extremely social which is ideal for aerosol transmission – the main route of transmission
- Incubation period is as long as 42 -84 days
- Cause clinical disease and mortality and is a zoonosis
- If infected they will be a source to other buffalo and other species
What is the risk of contracting BTB?

- Rather low but:
- Always insist on tested buffaloes and have the results verified when purchasing
- The skin test remains the test of choice
  - It is expensive to immobilize again but must be read with a calliper
- The Interferon Gamma test can be used for a screening test
  - False positive tests occur in certain areas and under extended captive conditions. Skin test used to verify
- Three possible sources of infection:
  - Other infected buffaloes
  - Infected cattle. The disease prevalence is increasing in cattle
  - Other infected wildlife when introduced with buffaloes
Regulatory consequences of BTB infection

- Confirmed through skin test and a necropsy with a positive culture. Difficult to isolate & confirm from excretions when infection is still sub clinical
- Can be retested after 8 weeks to confirm before necropsy
- This will take 6 to 8 weeks to confirm diagnosis
- A positive culture will require 5 consecutive negative skin tests 3 months apart over a period of 15 months of all the animals in the herd
- Treatment not an option at the moment but when considering the value of some buffaloes it will have to be contemplated in future
Contagious Abortion

- Caused by *Brucella abortus* (Biovar 1)
- This is an exotic disease and a zoonosis
- The bacterium settles in lymph nodes and eventually in the gravid uterus, udder and supermammary lymph nodes, spleen, testes and male accessory glands and joints. High levels of erythritol in the foetal membranes attracts the bacterium
- The first calf to be born after infection is extremely likely to be aborted during the last trimester
- Subsequent calves to be born can be infected congenitally with *B. abortus* and the infection cycle will continue. Only test +ve after 18 months
- Males also become infected and an orchitis and arthritis can develop. It is difficult but possible for males to transmit the disease but fertility and mobility can be severely compromised
Consequence of infection

- In the case of brucellosis, any serological titre using the standard complement fixation test (CFT) will be considered a positive reactor. All SAT titres or Rose Bengal reactions should also be treated as positive.
- Under free-ranging conditions, if CA is diagnosed, then the property will be placed under quarantine. Testing of all animals and slaughter of positive animals is recommended, if feasible. Only after the animals have had 3 consecutive negative tests every two months since the last positive animal was removed, can the farm/facility can be considered negative.
- Heifer calves from CA positive dams must be tested twice for CA after their first calf is born. These tests must be done at 3 and 9 weeks after calving.
Indigenous Diseases causing clinical signs in buffaloes

- Rift Valley Fever
- Malignant Catharral Fever
- Heartwater
- Foot and Mouth Disease
- Theileriosis
- Anaplasmosis
- Babesiosis
- These occurrences are more the exception than the rule
Indigenous diseases not causing clinical signs in buffalo but +ve tests

- Trypanosomosis
- Wesselsbron
- Ephemeral Fever
Exotic diseases

- Bovine tuberculosis
- Contagious Abortion
- Rinderpest
- Moraxella bovis
- Parainfluenza virus
- Leptospirosis

Universal Multispecies Diseases

- Anthrax
- Botulism
- Blackquarter
- Rabies
Poisonings

- Usually management related
  - Salt poisoning
  - *Microcystis aeruginosa*

- Plant poisonings
  - Seneciosis
  - Gifblaar
  - Gousiekte

Skin conditions

- Papilloma virus
- Pox virus
- Iatrogenic loss of pigmentation
- Ringworm
- Mange
  - Demodectic
  - Sarcoptic
  - Psoroptic
Parasites causing clinical signs in buffalo

- Parafilariosis
- *Demodex cafferi*
- Sarcoptic mange
- Coccidiosis
- *Psoroptes pienaari*
- Internal parasites
Demodex cafferi

Diseases of buffaloes

Iatrogenic loss of pigmentation (Vitiligo) possibly stress related but irreversible
Preventative disease management

- Effective perimeter fencing
- Appropriate water supply
- Veld management
- Nutrition management
- Sourcing of buffaloes and other species
- Species composition including cattle
- Vaccination program
- Necropsies when any mortalities occur.
- Parasite control
- Removal of non-performers
Vaccination program

- When you do decide to vaccinate, booster applications become imperative
- Can be very important especially in semi-intensive breeding systems
- The use of live vaccines must be carefully considered – Rift Valley Fever in pregnant buffaloes will cause abortion
- Diseases involved are Anthrax, Clostridial diseases, RVF, Pasteurella, Mannheimia
- Autogenous vaccines – Design Biologics
### Vaccination program

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Buffalo</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Anthrax</td>
<td>Annually</td>
<td>Depends on area</td>
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<tr>
<td>Clostridial Diseases</td>
<td>+</td>
<td>Intensive systems, stress</td>
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<tr>
<td>Rif Valley Fever</td>
<td>+</td>
<td>History of epidemics</td>
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<tr>
<td>Mannheimia</td>
<td>+</td>
<td>Stress, cold &amp; captivity</td>
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Maintain Cold Chain!!!!!!!
Buffalo female genital tract abnormalities
Actinobacillus lignseroi

Diseases of buffaloes

Actinomyces pyogenes

Diseases of buffaloes
Tick control

- Ticks are an essential part of a natural ecosystem. However, they need to be managed on a game ranch.
- Cattle forage with wild ungulates during January and February – in between they are dipped every 7 days.
- Fire is only partially effective.
- Overstocking must be avoided.
- **Wildlife Tick Carriers:**
  - Giraffe, buffalo, eland, impala and kudu are carriers of adult stages and boost tick populations.
- Individual animals may be more susceptible and removed when identified.
- Old and sick animals are also more susceptible and should be removed.
Why disease control is important

- The African buffaloes is the carrier of more than 50 different diseases and parasites
- They are very susceptible to FMD infection and remain permanent carriers
- With the current distribution of disease free buffalo in South Africa we must do our utmost not to allow FMD to escape from the Infected Zone
- Effect of the four key diseases.
- Also keep your industry and other industries free from other diseases
- It is considerably more difficult to control or eradicate infectious diseases in wildlife because they are simply not that easily manageable
- The effect of emerging and foreign diseases can be devastating
- If you remove the current disease free status of buffaloes and other wildlife they become far less valuable