



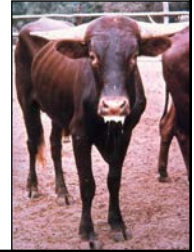
UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

The role of subclinical cattle in spreading FMD: Is blaming buffalo...Bull?

Mary-Louise Penrith¹ & Mokganedi Mokopasetso²

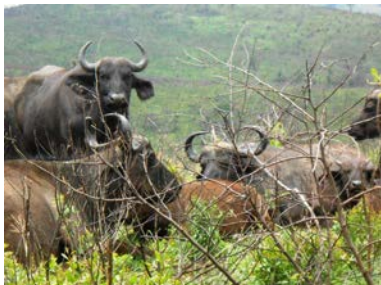
1 - Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria

2 – Botswana Vaccine Institute



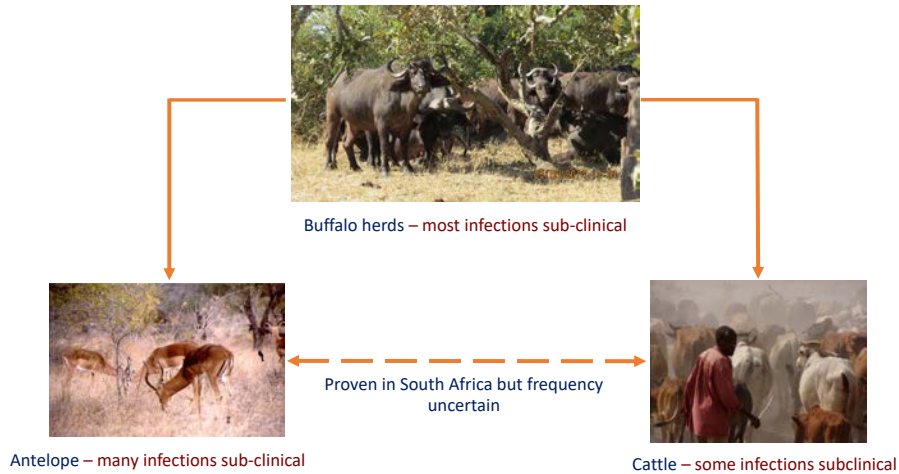
Introduction

- The South African Territories (SAT) foot and mouth disease (FMD) viruses evolved in African buffaloes
- SAT types of FMD virus are the only indigenous FMD viruses in southern Africa, with a reservoir in African buffaloes
- Outbreaks of FMD in cattle were usually linked to contact with buffaloes
- In East Africa the SAT viruses have adapted to cattle and circulate independently of buffaloes – distribution of outbreaks often not linked to buffalo distribution
- The same situation appears to be developing in SADC region



Transmission of FMDV between African wildlife & livestock

Only African buffalo & cattle populations appear to be able to maintain SAT serotype viruses independently



3

How does circulation in cattle populations work?

- Some cattle are known as “carriers” because FMD virus is present in the oropharynx for up to 2 years BUT no transmission of virus has ever been demonstrated scientifically
 - Carriers are defined as asymptomatic infected animals that can transmit a pathogen to susceptible in-contact animals
 - Some recent research “proving” transmission from carrier cattle provided no evidence for transmission without human assistance
- In many diseases without a carrier state, pathogens are able to circulate until there are no more susceptible animals to infect
- Unlike the Eurasian serotypes of FMD, the SAT types cause mild disease with low apparent morbidity (AMR)
- In most SAT outbreaks, fewer than 10 percent of the cattle show clinical signs

FMD viral lineage	No of events	AMR >10% (overall percentage)	Average AMR (%)
Eurasian (World-wide)	51	30 (58.8)	35.4
SAT (Southern Africa)	34	3(7)	3.3

How does circulation in cattle populations work?

- Absence of clinical signs does not mean absence of infection!
- Subclinically infected cattle can shed virus, although less than clinically infected cattle
- The cattle are only infectious for a short time (i.e. they are not 'carriers')
- A lot of cattle shedding a little virus in the same place can add up to enough virus to infect susceptible cattle in close contact
- This happens where cattle of different origins are crowded together, e.g. at crush pens or watering points
- It most often happens in unvaccinated cattle – so how can it happen in Ngamiland?



Is this happening in Ngamiland?

- Many of the FMD outbreaks in Ngamiland (and elsewhere in the region) are not linked to buffalo presence
- The most likely explanation is that virus is circulating in the cattle population independently of buffaloes at least in some areas
- Due to the low morbidity in extensively kept cattle, some outbreaks may not be noticed or reported
- Cattle may be moved over quite long distances for grazing or water
- Inadequate vaccine coverage increases the number of susceptible cattle and can have several causes even when the vaccine is of good quality and is administered at the intervals determined by law:
 - Cattle are not being presented for vaccination in sufficient numbers to attain adequate coverage
 - Duration of immunity induced by killed vaccines is short (4-6 months) and it also varies amongst individual cattle, so a proportion of the cattle may not be sufficiently protected for some time before revaccination
 - SAT viruses show high antigenic variation and the vaccine strains may not be effective against viruses that they do not match
 - Vaccines can lose potency as a result of cold chain problems
 - Each animal must always receive the full recommended dose of the vaccine in order to be protected

What are the implications for management and control?

- Research is needed to determine the extent of subclinical infection in cattle in our Red zones
 - This would help to identify high risk hot spots
- Detection of outbreaks cannot depend only on clinical surveillance, but professional herding would result in even low numbers of cattle with clinical signs being reliably detected
- Risk mitigation measures needed including avoiding large gatherings of cattle e.g. through herding
- Good vaccine coverage to reduce shedding, with regular post-vaccinal monitoring and matching of field strains with vaccine strains



Conclusion

- The buffaloes are not always responsible for an outbreak of FMD - it could be ... the bull!

