



Risk factors for brucellosis -Zimbabwean experiences-

Gift Matope
Department of Paraclinical Veterinary Studies
University of Zimbabwe
P.O. Box MP 167
Mount Pleasant
Harare



Brucellosis

A difficult condition caused by a “tricky bug”

- **Aptly described as contagious abortion, but not sure on how to define incubation period**
- **Bacteriologists find the bug is extremely difficult to culture because it is fastidious**
- **And yet once isolated, it is highly infectious**
- **We often rely on imperfect serological tests**





Historical background of brucellosis

- Brucellosis in cattle first suspected in 1906 and confirmed near Harare(Salisbury) in 1913
- Dr L. Bevan was attributed as the first to demonstrate that *B. abortus* was zoonotic (Anon. 1957)
- Cattle brucellosis was gazetted as a notifiable disease around 1930s
- Culminated with the introduction of the brucellosis accreditation scheme in the early 1980s

.....and yet a pandora's box was opened!





Brucellosis in domestic animals in Zimbabwe

- Bovine (*B. abortus*): Well documented by serology as well as by culture and isolation
- Caprine/ovine (*B. melitensis*): Yes but infrequent? Recent survey on about 500 goats from Beatrice area yielded negative results
- Porcine (*B. suis*): Unknown. Recent isolation?
- Canine (*B. canis*): Yes, but...relatively unknown (*Chinyoka et al., 2014. JSAVA*)

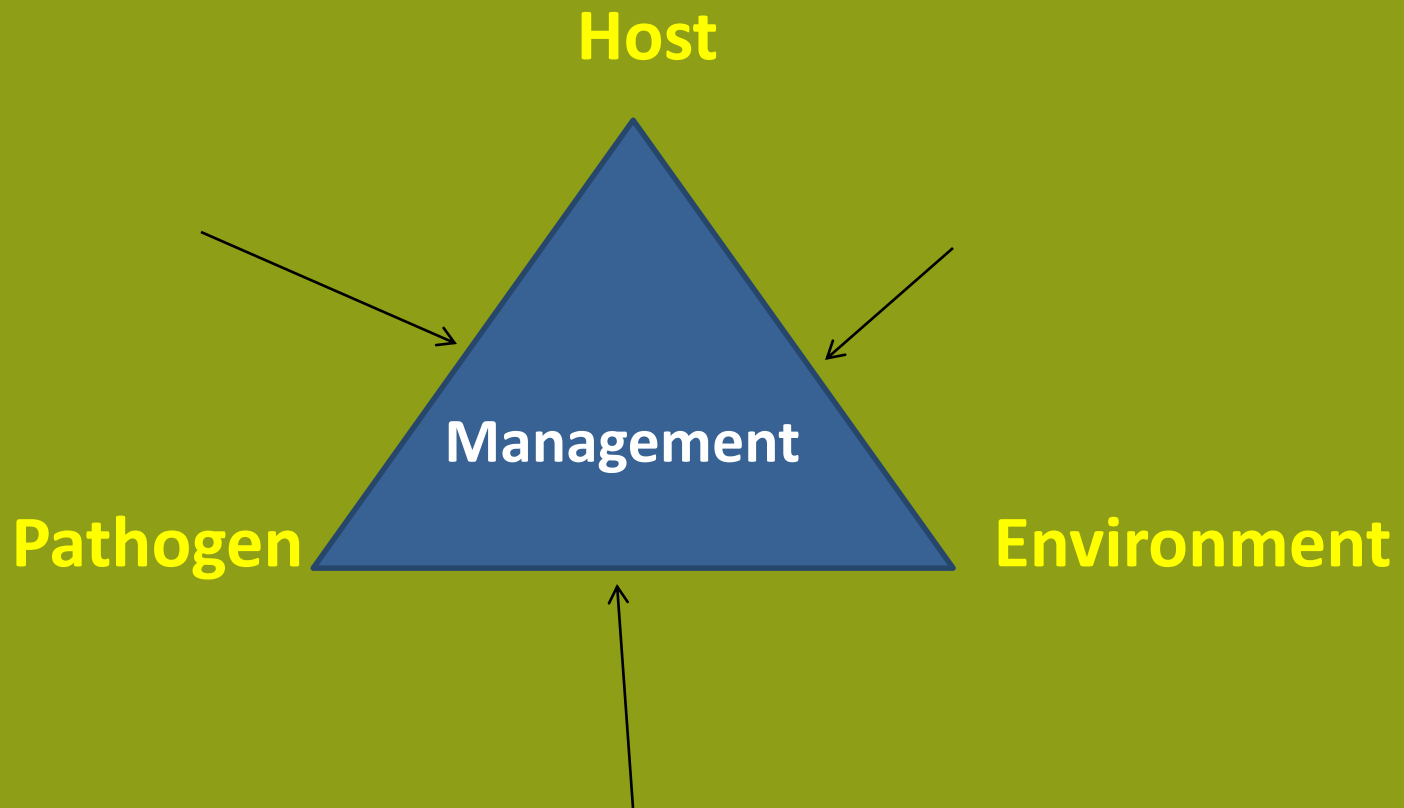


Brucellosis in animals in wildlife

- Serological evidence in several wildlife species has been documented; confirmed by isolations
- Serological evidence in several species such as the buffalo (*Syncerus caffer*), impala (*Aepyceros melampus*), eland (*Taurotragus oryx*), etc
- While in others, brucellosis has not been demonstrated



Risk factors for brucellosis emergence



- Factors that may increase the animal's risk of infection with *Brucella* spp.



Factors related to the pathogen

- Currently, 10 *Brucella* species recognised, but atypical species continue to be identified
- Although *Brucella* species tend to discern hosts in causing overt disease, cross-infections may occur
- However, the species and strains circulating are relatively unknown
- Where they are known, strain traceability becomes a major issue



Host factors

- **Within animal species: individual level (sex, breed, age) and herd-level factors (immune status, herd size)**
- **Between animal species; sharing same ecological space**
- **In wildlife, brucellosis consistently demonstrated in gregarious animals eg buffaloes, and less so in solitary species, eg the rhinoceros species**





Factors related to the environment

- Survival and persistence of brucellae in the environment, dependent on T°C, moisture, etc
 - not well documented in the tropics
 - difficult to use habitat suitability modeling to predict risk of brucellosis
- Climate change: also linked to changes in land use
 - changes on the environment; eg. grazing , etc





Changes to land use and management

- Changes in agricultural practices/animal management practices
 - establishment of smallholder dairies in rural areas that were previously free from brucellosis
 - the agrarian reform programme in the year 2000
 - Increased animal movements





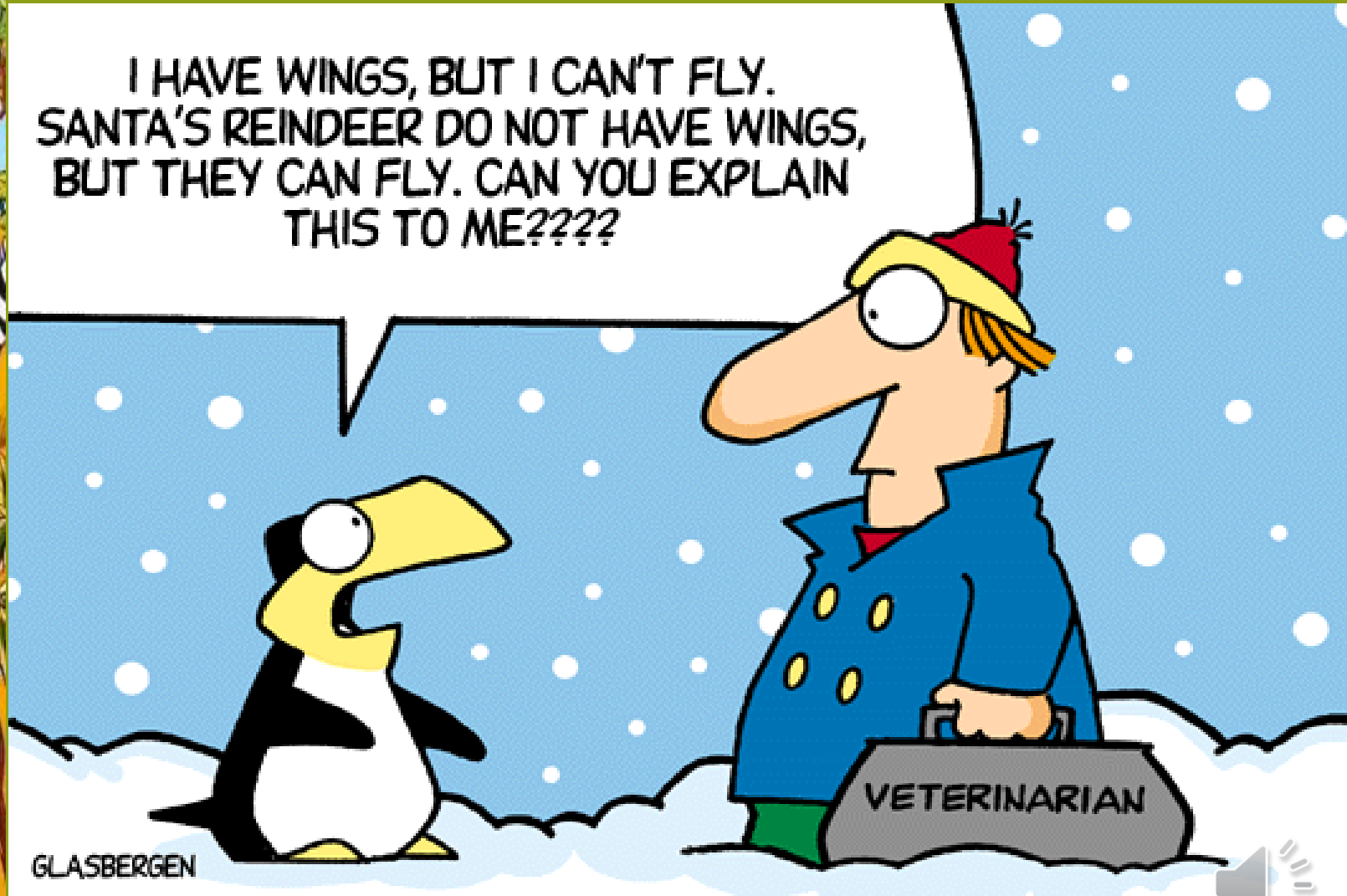
Changes to land use and management

- Changes in ecotourism and land management
 - The creation of large land mosaics under the transfrontier conservation area (TFCA) initiatives
 - Examples of brucellosis in Kafue lechwe (Kafue) and black lechwe in Bangwelu plains in Zambia
- Anthropogenic factors
 - Practices of people living on the edge of TFCAs
 - Traditional beliefs, eg medicinal value of goat milk



Information gaps and key questions.....?

I HAVE WINGS, BUT I CAN'T FLY.
SANTA'S REINDEER DO NOT HAVE WINGS,
BUT THEY CAN FLY. CAN YOU EXPLAIN
THIS TO ME?????



GLASBERGEN





Information gaps and key questions

- **1. Patterns and drivers of brucellosis**
 - What is the spatio-temporal epidemiology of brucellosis?
 - What are the key drivers of brucellosis in cattle?
 - Brucellosis in small ruminants?



Information gaps and key questions

- 2. The role of the interface in the TFCAs
 - Mobility patterns and contacts between wildlife and domestic animals?
 - Is contact with wildlife a risk factor for brucellosis in domestic animals?
 - What are the ecological drivers of brucellosis at the interface?





Information gaps and key questions

- 3. *Brucella* spp. strain distribution and host range
 - What are the important *Brucella* spp. associated with brucellosis ?
 - What is their host range?
 - What is the molecular epidemiology of *Brucella* spp?





Information gaps and key questions

- 4. Socio-economic impact of brucellosis
 - What is the impact of brucellosis on livestock production and wildlife conservation?
 - What is the public health impact of brucellosis?
- *We regard brucellosis as the world's most widespread of all zoonoses and apart from its toll on people, it has an enormous impact on the animal industry*
- *WHO, 1998*



Concluding remarks

1. Considering the economic and public health significance of brucellosis, there is need to control (or possibly eradicate it) in animals, but there is merit in:

- Establishing spatial epidemiology
- Determining the various drivers of brucellosis
- Determining the host range for brucellae

2. Need to foster multistakeholder involvement





I thank the following:

1. **University of Pretoria**
2. **The University of Zimbabwe**
3. **The RP-PCP**





Thank you

