

Serological surveillance of caprine brucellosis in western Kenya

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Presentation outline

People, Animals and their Zoonoses project

Brief overview of brucellosis in Kenya

Serological survey of caprine
brucellosis in western Kenya

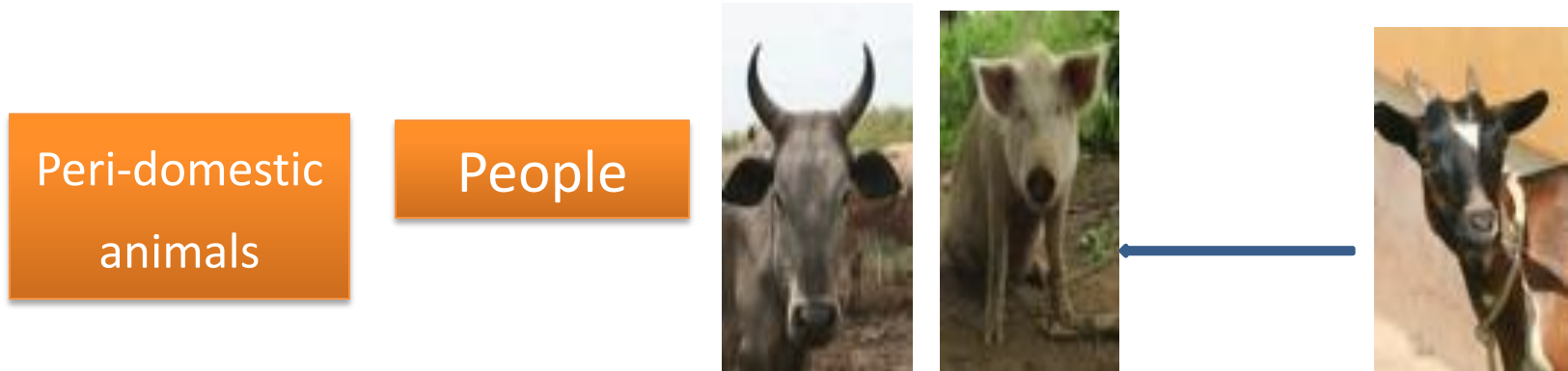
Pending question from earlier presentation

Brucellosis in camels?

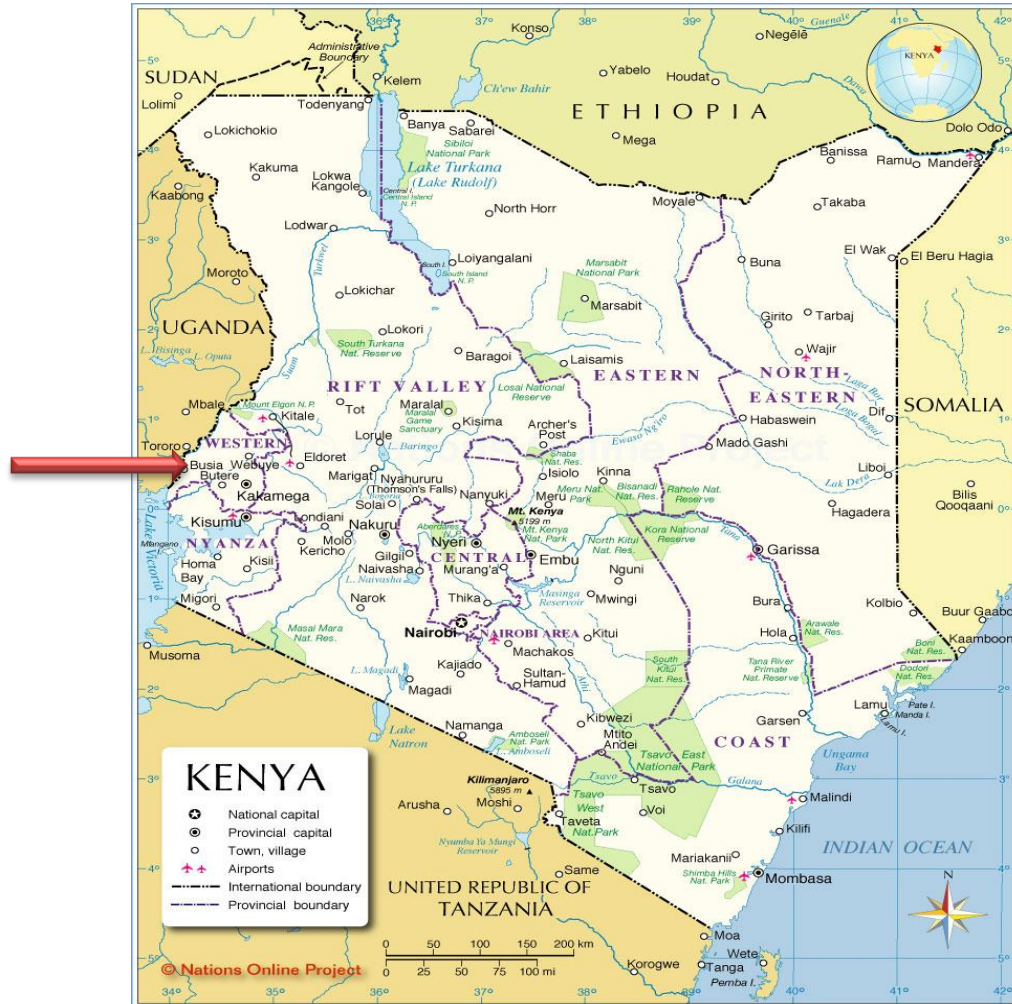
- Waghela et al. (1978): 172 camels were sampled from Northeastern province. 11 of 172 sera tested reacted in RBPT, 11 in SAT and 21 in CFT.
- Saudi Arabia 8% prevalence *B. melitensis* (Radwan 1992)

People, Animals and their Zoonoses (PAZ) project

- Partners involved: UE, KEMRI & ILRI
 - Study site: western Kenya. www.zoonotic-diseases.org/home/research/paz
- ❖ The caprine brucellosis work was added as a component of the PAZ project. I am very grateful for the opportunity and support offered by Professor Eric Fèvre (PI. PAZ Project)



Study site



Brucellosis in Kenya

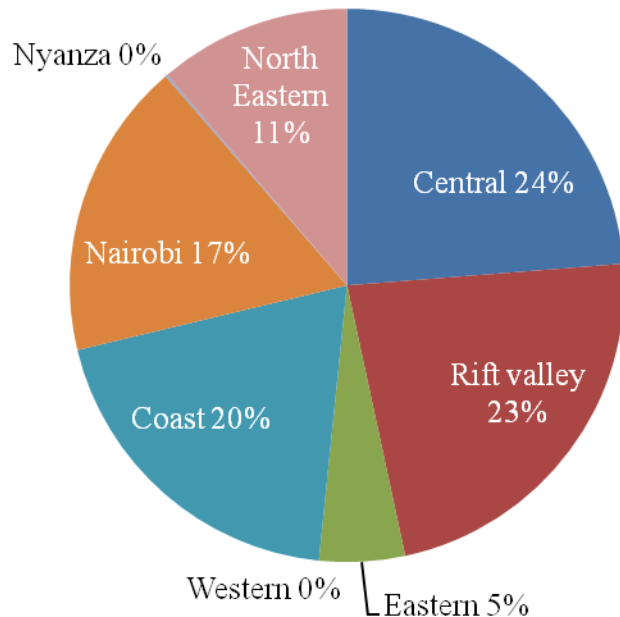
- According to WHO report, under-reporting of brucellosis in Africa is probably higher than 99%, since almost all diagnosed cases are a result of special studies on the disease (WHO 2011, P.15)
- Brucellosis persists more in the pastoral systems (Radoz et al. 2013). This is a true reflection in Kenya.
- Brucellosis recognized as a notifiable disease in 2011.
- ZDU formed in 2008 to enhance One Health approach and co-ordination

Some of the prevalence studies done in Kenya

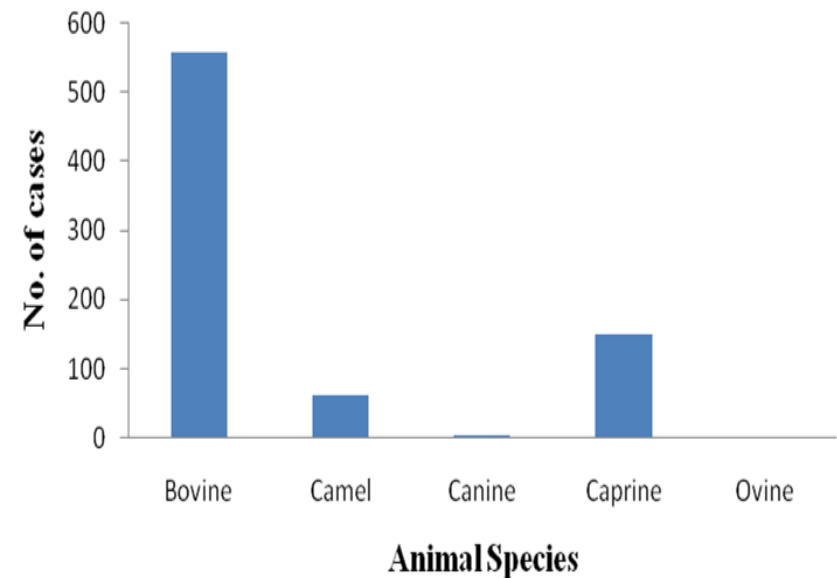
Author & year of study	Sample	Place	Test (s)	Prevalence (%)
Namanda (2009)	Milk (cattle)	Eldoret	MRT	0
Waghela et al. (1978)	Serum (camel)	Northeastern	RBT & SAT	6.4
Waghela et al. (1978)	Serum (camel)		CFC	12.2
Kang'ethe et al. (2000)	Milk(cattle)	Nairobi	ELISA & MRT	4.9
		Kiambu	"	3.9
		Nakuru	"	2.4
		Narok	"	3.4
Waghela (1986)	Serum (blue wildebeest)	Maasai Mara	SAT and CFT	18
	Serum (African buffalo)	"	"	30

Brucellosis laboratory data recorded from 2003 to 2010 (Olwande 2013)

Distribution of brucellosis cases by province, DVS,2003-2010



Brucellosis cases by species, DVS, 2003-2010



Why the study?

- *B. melitensis* causes more prolonged, severe and debilitating illness than that caused by *B. abortus* or *B. suis* (McDevitt 1973)
- No data (study) on the role of goats in the epidemiology of brucellosis in western Kenya
- Farmers in western Kenya are slowly adopting dairy goat rearing, therefore consuming goat milk



Study objectives

- Estimate the seroprevalence of caprine brucellosis in western Kenya
- Assess the spatial distribution of the sero-positive cases of caprine brucellosis in western Kenya
- Assess the risk factors associated with the transmission of brucellosis

Sample size calculation

Population survey or descriptive study
For simple random sampling, leave design effect and clusters equal to 1.

Population size:

999999

Expected frequency:

50 %

Confidence limits:

5 %

Design effect:

1.0


Clusters:

1

Confidence Level	Cluster Size	Total Sample
80%	164	164
90%	270	270
95%	384	384
97%	471	471
99%	663	663
99.9%	1082	1082
99.99%	1512	1512

Sampling design

Division Since we had no sampling frame, the number of households to be sampled per sub-location depended on the divisional livestock population. E.g. sub-locations falling in highly populated livestock divisions were given more households than those with lower populations



Sub-location GPRS to select households

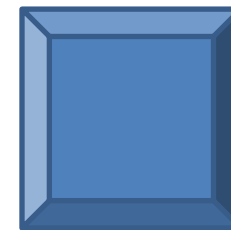


Household Goats - questionnaire and jugular blood collection

Pictorial presentation of data collection and laboratory sample processing



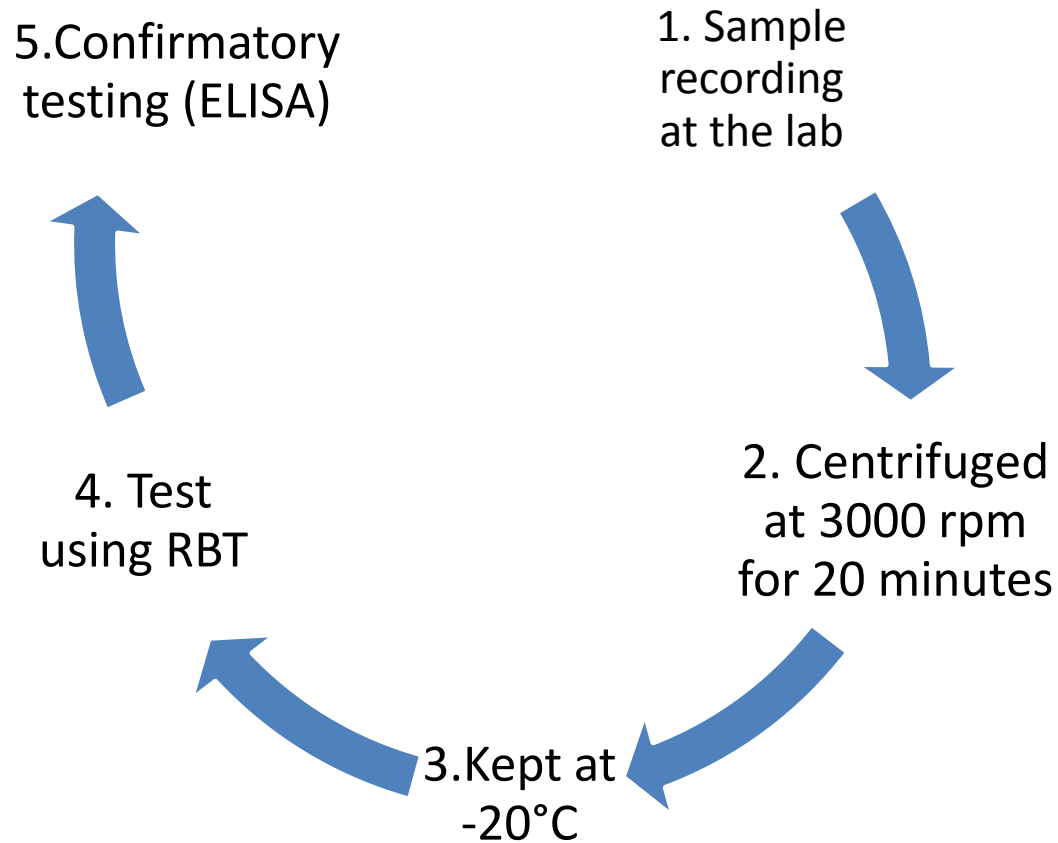
Data
collection/teording in
hand palm computer



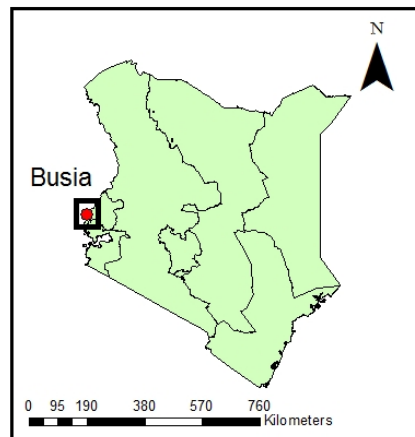
Data
analysis



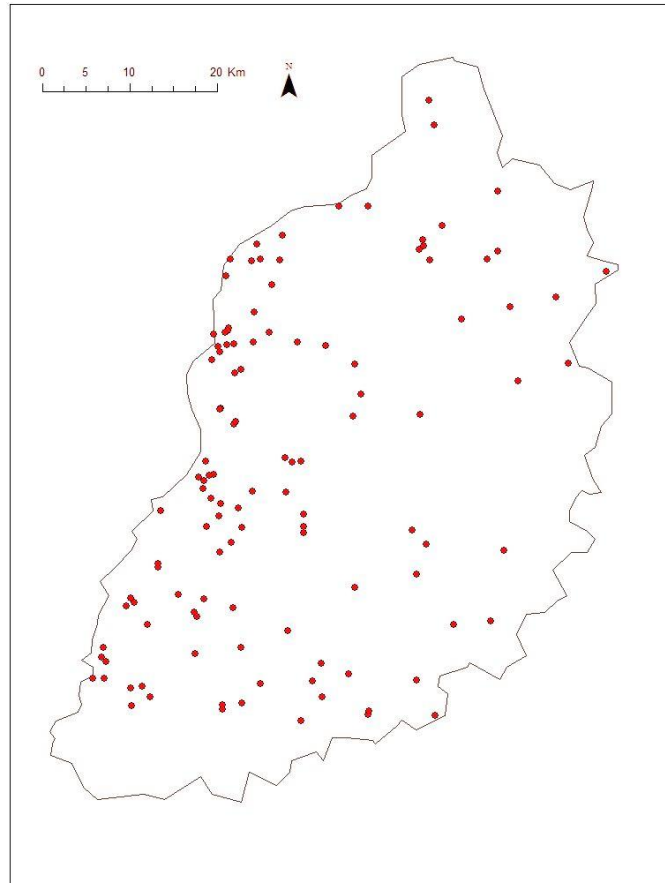
Laboratory work



Results



Map of Kenya



Map showing the location of the sampled households

Key:
Dots represent
the sampled
households

Results contd.

- A total of 412 homesteads were selected for sampling
- 27% (112/412) of the selected households kept goats
- 4.29% goats sampled had experienced abortion
- Rose Bengal Test: No positive results (n = 355)

Discussion & conclusion

- The RBT results gave a prevalence of zero, suggesting that goats in western Kenya may be free from *B. melitensis*. Since RBT has a sensitivity of 80.2% and a specificity of 99.6%, unlike ELISA that has specificity of 92.9% and is 99.6% specific (Rahman et al. 2013), there is need for this result to be confirmed with ELISA to rule out the 19.8% chance of a false negative. We will therefore use ELISA to confirm the results before making a final conclusion of this result.
- There is need for regular surveillance and education on the prevention and control of brucellosis to reduce or avoid the risk of transmission in animals and people.

Parting shot

- Goats can easily pass zoonotic infections due to their close interaction with people
- Let's join hands in controlling brucellosis for a better future!



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It is implemented in partnership with



Thank you

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ILRI is a member of the CGIAR Consortium

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