Prevalence of antibodies against\textit{Brucella} among breeding goats in relation to source: A case study in Mbarara District, South Western Uganda

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Study back ground

• Government of Uganda is running a program of supplying breeding goats - NAADS
• Vets to verify carry out technical audit and recommend for purchase
• Evidence of brucella in the area from studies
• Proposal to district local council, passed with financial obligations now a bye law
• Achievements realized amidst challenges and limitations including;
• Opposition from suppliers, farmers, politicians and even fellow vets
Challenges

- Cost of identification (tags) by supplier
- Cold chain
- Fate of positive cases
- Status of destination farms
- Brucellosis control in the hands of farmers
- Vaccine supplies
- Compromises alterations and forgeries
- Congesting the procurement exercise in the same period
Current control

- In animals, treatment to control the disease is not usually undertaken since there is no confirmed effective treatment.
- Living avirulent organisms are now used in a vaccine – which offers immunity for more than 4 years in goats.
- Vaccinating adult or pregnant does has drawbacks because of excretion of Br. melitensis in milk or abortion that may occur Blood et. al.,(1983).
- However reduction of vaccinating dose by has made it less likely to cause abortion, be excreted in milk or interfere with serological tests.
- Br. abortus strain 19 has also been used in goats and appears to give protection which is as good as that achieved with the attenuated Br. melitensis vaccine Blood et. al.,(1983).
Objectives of the study

Overall objective
   To screen all goats destined for breeding so as to;

- Pass on Brucella free goats
- Ensure value for money
- Protect image of the program
- Create awareness
- Generate data
Specific objective to compare disease prevalence among goats sourced from markets and those from farms

Farm situation - low risk

Market situation high risk
Problem

- reported storm abortions (>50%) are proved to be due to brucella

- No screening of goats before introduction into new farms

- most goats found in markets are problem ones with history of abortions

- Many farmers/suppliers source goats from livestock markets
Problem ...

- Once in market /congested confinements, contagious diseases spread

- Vaccine unavailable if so the cost is prohibitive.
methodology

- Understudy methods used to establish the source of goats

- Selected goats identified by ear tagging

- Bleeding goats from the jugular vein into anticoagulant free tubes

- Samples placed in a cool box upright position and refrigerated overnight

- RBPT done results declared in 24hrs.
methodology...

• RBPT has been internationally recommended for screening small ruminants (Garin – Bastuji and Blasco, 1997)

• It is rapid, simple and sensitive although of low specificity (Flad, 1983)

• Nevertheless, RBPT is reliable owing to its high degree of reproducibility and accuracy
Results and discussion

• 17 Sub counties and divisions were involved in the screening exercise for a period of 3 years

• A total of 7739 goats were sampled and screened and 1045 (13.4%) tested positive

• 3 intervals i.e. (0-9%) low average (4.45%), core average (10-19% (12.63%) & high average (20-29%) (25.15%)

• A hypothesis to test for variation significance in average prevalences was subjected to the Chi-square test for significance
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0 - 9%
low average
*2.63 (10)
*5.2 (10)
*5.53 (15)
4.45

10 - 19%
core average
*11.19 (15)
*13.07 (30)
*11.8 (65)
*12.18 (62)
*12.86 (30)
*12.26 (52)
*12.2 (70)
*13.66 (39)
*10.42 (35)
*12.57 (50)
12.63

20 - 29%
high average
*28.46 (90)
*26.62 (80)
*20.37 (75)
25.15

Overall average 13.4%
* Prev (%)

() proportion (%) market sourced
Red computed class average
Test for variation significance

<table>
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<th>Core ave.</th>
<th>Higher ave.</th>
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<td>25.15</td>
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<td>Expected frequency (fe)</td>
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<td>(fo-fe)^2/fe</td>
<td>5.78</td>
<td>0.04</td>
<td>10.3</td>
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\[
X^2 = \sum \frac{(fo - fe)^2}{fe} = \frac{5.78 + 0.04 + 10.3}{13.4} = 16.12
\]

\[
d.f = (c-1)(r-1) = (3-1)(2-1) = 2
\]

Tabulated/critical \(X^2\) values for both 1 and 2 tail tests are 5.99 & 7.378 at 5% and 2.5% level of significance and 2 degrees of freedom. Computed \(X^2\) 16.12 is greater than both tabulated values, the hypothesis is rejected implying that **There is a significant variation in the prevalence of antibodies against brucella among breeding goats in relation to source.**
Key findings

• There is a wide range in disease prevalence (2.63 – 28.46) and incredibly high overall disease prevalence of 13.4%
• Source of goats seems to influence the disease prevalence
• Over all market sourced proportion make 30% ranging between 10 & 90%
• The more the market purchases the higher the observed disease prevalence – positive correlation
• The *chi-square* test result indicate a significant variation in disease prevalence
Conclusion

• Because some farmers are of brucellosis they send their goats to livestock markets for sale to unsuspecting buyers although others do it unknowingly.

• Source of breeding stock i.e. market or farm influences the disease prevalence and screening animals before they are transportation is an effective and reliable measure to check disease transfer.

• The results suggest that livestock markets are a no going area for breeding stock, may be prudent to begin looking at livestock markets as no way through - no return centers.

• Continuous transportation and introduction of untested animals on farms aids inter herd and intra herd transfer of disease leave alone putting humans at risk.
Thank you for your attention