Selected results of surveys on brucellosis in small ruminants and cattle in traditional farming systems in regions of The Gambia and Guinea, the associated public health risk and perception of farmers & stakeholders

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Consumer Safety and Public Health Project

**Overall objectives and activities:**

Public health risk, including zoonoses, derived from consumption of animal products

- Milk hygiene & Meat hygiene
- Zoonosis: Bovine tuberculosis & cysticercosis
  - Rift Valley Fever

Related activities:
- Capacity building
- Training/awareness campaigns
- Installation of Milk Processing Units

Surveys on brucellosis in The Gambia and Guinea

**Situation prior to the project:**

- Elevated abortion rates observed by farmers in animals of usually unknown ethiology
  - Brucellosis?
- Little known on perception of farmers on zoonoses
- Little awareness & lack of diagnostic capacity of VH & PH services
  - Problems in man: „Flu-like“ or „malaria like“ leading symptoms
  - Therefore not considered/detected in local health centres!

- Milk mainly consumed fresh or fermented
Surveys on brucellosis in The Gambia and Guinea

Objectives

- **To assess the current status of the brucellosis** due to *Brucella spp.* in cattle & small ruminants in selected regions of The Gambia and Guinea, by serological screening
- **To investigate potential infections in humans at risk of contact with positive animals**
- **To understand the importance & perception** of farmers and risk groups towards brucellosis

Steps

1. On-farm screening
2. PRA – Disease importance ranking (farmer /risk groups, 2003-4)
4. Interventions (milk processing, 2004 onwards)

Brucellosis – on farm screening

**Cattle (herds):** 2001-2003
Step 1: Questionnaire
   (background data on brucellosis)
Step 2: 17-20 herds/region
   Sampling: up to 45 cattle per herd
   (> 6 month, expected P: 10%)
   & bulk milk sample)

**Small ruminants (village herds):** 2004-2005
Step 1: Questionnaire
   (background data on brucellosis)
Step 2: 14-15 villages/region
   Up to 59 SR (>6 mth.) per village
   (expected P: 5%)
   & bulk milk samples if applicable
Brucellosis – serological screening in man and tests applied

Humans: Volunteers in each selected region and samples from local hospitals*
The Gambia: CRD
Guinea: Dubreka and Kindia

Tests applied: Rose Bengal Plate Test (serum)
Complement Fixation Test (serum)
Milk ELISA (bulk milk already fermented)
Milk Ring test (MRT) (bulk milk)

* Case definition used

Study sites in The Gambia
Study sites in Guinea

Bovine brucellosis – results cattle

<table>
<thead>
<tr>
<th>Results</th>
<th>The Gambia</th>
<th>Guinea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CRD</td>
<td>Dubreka</td>
</tr>
<tr>
<td>Herds sampled</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Cattle sampled</td>
<td>465</td>
<td>749</td>
</tr>
<tr>
<td>Individual animal prevalence (%)</td>
<td>1.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12.7&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Herd prevalence based on serum (%)</td>
<td>15.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>94.1&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Herd prevalence based on bulk milk (%)</td>
<td>15</td>
<td>80</td>
</tr>
<tr>
<td>Percentage of herds with „Within herd prevalence” ≥ 10%</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

Seropositivity and abortion history for cattle: Odds ratio: 8.0 (4.9, 1.7)
Seropositivity increased with herd size and age of cattle.

<sup>a,b</sup>: Differences between districts (<0.05)
### Brucellosis in SR – results

#### Results brucellosis

<table>
<thead>
<tr>
<th></th>
<th>The Gambia</th>
<th>Guinea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Saloum (CRD)</td>
<td>Niamina Dankunku (CRD)</td>
</tr>
<tr>
<td>Herds sampled</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Sheep sampled</td>
<td>306</td>
<td>303</td>
</tr>
<tr>
<td>Individual animal prevalence in % (CI)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Village herd prevalence (%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Goats sampled</td>
<td>302</td>
<td>387</td>
</tr>
<tr>
<td>Individual animal prevalence in % (CI)</td>
<td>0.3 (±2.0)</td>
<td>0</td>
</tr>
<tr>
<td>Village herd prevalence (%)</td>
<td>6.7 (±3.8)</td>
<td>0</td>
</tr>
</tbody>
</table>

*Odds Ratio* for factor seropositivity and abortions for sheep: 7.6 (1.1; 36.6) and for goats: 10.8 (0.90; 75.2)

### Brucellosis results in man

#### Results for brucellosis in man

<table>
<thead>
<tr>
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<th>Guinea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Saloum CRD</td>
<td>Niamina Dankunku</td>
</tr>
<tr>
<td>Samples</td>
<td>34</td>
<td>30</td>
</tr>
<tr>
<td>RBT+ve</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CFT+ve</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Patients with „malaria like” symptoms
Perception on zoonoses (brucellosis) of farmers and risk groups

**The problem**

- Previous studies focused mainly on the animal health aspect
- Perception of livestock owners and risk groups on zoonoses have been rarely investigated in the past

**Period and location:**

2003  The Gambia (CRD)
Guinea (Dubreka & Coyah)

**Methodology:**  PRA (owners, herders and milk vendors)
Special tools applied: Disease importance ranking
Questionnaires (owners, butchers, veterinary and PH authorities)

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**Top three diseases or symptoms as ranked by farmers**

**Cattle:**
The Gambia:   Diarrhoea (unspecific), Trypanosomoses, H.S.
Guinea:     Diarrhoea (unspecific), Lumpy Skin, Foot problems (unspecific)

**Small ruminants:**
The Gambia:   Diarrhoea (unspecific), PPR, Pastorellosis,
Guinea:     PPR, Abortion, Foot problems (unspecific)

**Observations on chronic infections:**

Hygroma: only ranked high (no. 2) in Guinea
Observations by veterinary health authorities on most important zoonoses:
The Gambia: RVF, rabies, C. bovis
Guinea: brucellosis, anthrax and rabies

Observation on zoonoses & brucellosis by public health authorities
Rabies was highest ranked (even in the high prevalence areas for brucellosis)

Patients with “brucellosis or flu-like” infections are only tested for malaria if laboratory facilities are available. No differential diagnosis, e.g. brucellosis

Knowledge of personnel on brucellosis was poor, laboratory tests were not performed or usually not known in any of the locations visited.

Farmers’ ways of dealing with milk from cows with a history of abortion or observed hygroma
Consuming as milk: 77% (The Gambia) 73% (Guinea)
Proportion of heat treatment: 9% (The Gambia) 0% (Guinea)*

Recommendation for control

<table>
<thead>
<tr>
<th>Method</th>
<th>Chance to implement</th>
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<tbody>
<tr>
<td><strong>The Gambia:</strong></td>
<td></td>
</tr>
<tr>
<td>Test and Slaughter</td>
<td>low</td>
</tr>
<tr>
<td>Vaccination</td>
<td>very low</td>
</tr>
<tr>
<td>Test and Slaughter</td>
<td>low</td>
</tr>
<tr>
<td><strong>Guinea:</strong></td>
<td></td>
</tr>
<tr>
<td>Control of animal movement</td>
<td>low</td>
</tr>
<tr>
<td>Hygienic measures on farm</td>
<td>moderate</td>
</tr>
<tr>
<td>Increase of PH awareness</td>
<td>good</td>
</tr>
<tr>
<td>Education of farmers</td>
<td>good</td>
</tr>
<tr>
<td>Promotion milk processing</td>
<td>good</td>
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</tbody>
</table>

Reenforcement of collaboration between VH and PH services

Governments /donors approached for further funding possibilities:
No funds for control, not among priority zoonoses
(Government, GIZ, USAID, DFID despite or even because of emerging funds for AI)
FAO – TCP supported introduction of milk processing units
Surveys on brucellosis in The Gambia and Guinea

Conclusions:

Results for brucellosis vary by country/region

PH risk related to brucellosis clearly documented

Risk + Hazard for man (due to consumer preferences, unpasteurised milk)

Low perception of farmers and stakeholders on zoonoses (brucellosis)

Little interest from Government/donors to support control
– neglected Zoonoses

Successfull introduction of milk porcessing units

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