Management to prevent *Staphylococcus aureus* mastitis in small-scale dairy farms in Tanzania

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• Introduction
• Study methodologies
• Risk factors of mastitis infection
• Approaches towards better management of mastitis
  – Hygienic milking
  – Milking technique
  – The housing environment
  – Dry cow therapy as a preventive measure
  – Intervention measures to improve management
• Conclusions
• Dairy production in TZ is dominated by small-scale farmers (herd size of 2-10 cows) on 0.5-2 hectares

• About 150,000 farmers own about 90% of the estimated 600,000 dairy cows in the country and produce more than 70% of milk marketed off-farm (NBS, 2003)

• Among the factors constraining productivity of smallholder dairying is udder health
Incidence of subclinical mastitis on smallholder farms could be as high as 70% and clinical mastitis 2.0-2.8%

Up to 63% of mastitis cases as detected by the California mastitis test (CMT) can be infectious form of mastitis caused by:
- *Staphylococcus aureus*, *Streptococcus* spp. (*agalactiae* and *dysagalactiae*) and
- *Escherichia coli*

Hence detection, management and control of infectious mastitis among smallholder dairy cattle is an important strategy for its control nationally.
• Most of the research reviewed has involved cross-sectional studies on prevalence, aetiology, predisposing or risk factors and trials on preventive management of mastitis in general and staphylococcal mastitis in particular
### Practices that reduce mastitis infection

<table>
<thead>
<tr>
<th>Practice</th>
<th>Extent of use by smallholder farmers</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning hands with detergents</td>
<td>&lt;10%</td>
<td>Shem et al, 2001</td>
</tr>
<tr>
<td>Use disinfectant in udder wash</td>
<td>0%</td>
<td>Shem et al, 2001</td>
</tr>
<tr>
<td>Drying udder with clean single cloth</td>
<td>0%</td>
<td>Mdegela et al, 2009</td>
</tr>
<tr>
<td>Dry hand milking (non use of lubricants)</td>
<td>0%</td>
<td>Mdegela et al, 2009</td>
</tr>
<tr>
<td>Complete milking</td>
<td>30%</td>
<td>Shem et al, 2001</td>
</tr>
<tr>
<td>Post milking teat dip</td>
<td>26.8</td>
<td>Mdegela et al, 2009</td>
</tr>
<tr>
<td>Dry cow theraphy</td>
<td>19.5%</td>
<td>Mdegela et al, 2009</td>
</tr>
<tr>
<td>Training on mastitis</td>
<td>rare</td>
<td>Karimuribo et al, 2006</td>
</tr>
<tr>
<td>Milking sick cows last</td>
<td>variable</td>
<td></td>
</tr>
</tbody>
</table>
The housing environment

- Zero grazing
- Tie stalls
  - Hygiene and manure and waste disposal most important

Adapted from CAMARTEC, Arusha, Tanzania
The housing environment

WDS2012, South Africa: A world in one country

• Free stalls
• Free grazing on pastures
  – Hygiene and manure and waste disposal most important
• Shem et al. (2001) found lower level of mastitis in zero grazed cattle than free pasture grazing
Dry cow therapy as a preventive measure

Treatments by Shekimweri et al. (1998)

- **A**: Dry cow therapy + full hygiene (pre-milking teat udder wash + disinfection and post milking teat dip)
- **B**: No dry cow therapy + full hygiene (pre-milking teat disinfection and post milking teat dip)
- **C**: Dry cow therapy + routine hygiene (pre-milking teat disinfection only)
- **D**: Control (No dry cow therapy + routine hygiene (pre-milking teat disinfection only) (No dry cow therapy or post milking teat dip)
Dry cow therapy as a preventive measure

<table>
<thead>
<tr>
<th></th>
<th>Pre-treatment period (start of wk1)</th>
<th>After 8 weeks on treatment:</th>
<th>% reduction in incidence of isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A B C D</td>
<td>A B C D</td>
<td>A B C D</td>
</tr>
<tr>
<td>CMT +</td>
<td>21 18 16 23</td>
<td>12 16 12 18</td>
<td>43 11 25 22</td>
</tr>
<tr>
<td>Infectious</td>
<td>12 9 11 5</td>
<td>4 3 3 5</td>
<td>67 67 25 0</td>
</tr>
<tr>
<td>Bacterial isolate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Staphylococcus</em> spp.</td>
<td>7 1 4 4</td>
<td>4 - 1 1</td>
<td>67 100 75 0</td>
</tr>
<tr>
<td><em>Streptococcus</em> spp.</td>
<td>4 6 4 1</td>
<td>- 2 2 2</td>
<td>100 67 100 0</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>1 3 - 1</td>
<td>- 1 - 1</td>
<td>100 67 100 100</td>
</tr>
<tr>
<td>Others a)</td>
<td>- 1 1 -</td>
<td>- - - 1</td>
<td>100 100 100 50</td>
</tr>
</tbody>
</table>
Interventions to reduce mastitis

• Training in hygienic milking including udder wash and use of disinfectant such as hypochlorite at 80-100 ppm is basic requirement
Interventions to reduce mastitis ...

Regular testing of animals by CMT and use of post-milking disinfectants by farmers
Sustainability requires regular testing by extension services and training of farmers in dairy hygiene.

- Providing incentives such as payment for milk on basis of quality including somatic cell counts.
Conclusions

Studies in Tanzania have showed that it is possible to reduce the incidences of mastitis caused by *S. aureus* on smallholder farms by adopting

- Dry cow therapy combined with
  - Pre-milking udder wash
  - Regular use of post-milking teat dip with suitable disinfectant

- Sustainability can be ensured through regular testing and offering training of farmers and quality based incentives
Thank you for listening