Microbiological safety of milk and processing and consumption behaviour in pastoral areas in southern Ethiopia

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First Joint International Conference of the Association of Institutions for Tropical Veterinary Medicine (AITVM) and the Society of Tropical Veterinary Medicine, Berlin, 4-8 September 2016
Introduction

• Milk is prone to microbial contamination and subsequently loses its quality and safety
• The microbiological quality and safety of milk is affected by different factors:
  • health status of the animal
  • hygienic practices in the dairy premises
  • post-milking handling
  • processing practices
Milk production in Borana

Importance of milk in the diet pastoral communities

Risk of milk and milk products to contamination

Low education level of communities in safe milk handling practices

Livestock keepers and consumers at risk of infection with milk-borne pathogens

Research towards improving milk handling practices and locally adapted strategies to mitigate associated health risks
Objectives

• To assess dairy production and consumption behaviour of pastoralists
• To assess microbiological quality and safety of milk and traditional dairy products
Materials and methods
Qualitative research

Qualitative survey in 4 villages
• Semi-structured interviews with 40 women
• 4 Focus group discussions (one per village)

Questions on:
- milk production and processing practices
- quality and safety of milk including perceived criteria for good milk
- milk boiling practices
- milk-borne diseases
Materials and methods
Microbiological assessments

• 203 samples collected
  • 145 pooled milk
  • 40 fresh milk directly from udder
  • 18 ititu (fermented whole milk curd with whey removed)
• Tested by culture for *E. coli* O157:H7, *Listeria* spp and *Staphylococcus aureus*
• *E. coli* count
Results
Dairy production

- Cattle, camels and goats kept for milk production
- Cattle most important
  - processing of cow milk into different dairy products
  - use of butter for hair dressing and cosmetics
  - cow milk and sometimes goat milk converted into *Ititu*
Results
Dairy consumption

- Seasonal preference for camel milk (dry season)
- Consumption of camel milk considered a taboo by some Borana clans (e.g., Qallu Karayu).
- Goat milk mixed in tea: perceived better nutritional value
- Children drink fresh goat milk during herding
Results
Perception on quality and safety

• Proper smoking of containers ensures good quality and safety of milk and dairy products

• Reasons for smoking of milk containers:
  • increases shelf life of products
  • good consistency of curdled milk
  • pleasing flavour
  • health benefits
Results
Perception on milk boiling

• Boiling of fresh milk not common practice
  • “long time tradition of Borana people for not doing so”
  • the perception that “boiling of milk destroys vitamins”
  • “boiled milk is considered dead”
  • boiling of milk reduces the nutritional quality of milk
• However milk is boiled for children: to prevent qullichoo (cream, risk when vomiting)
Results
Milk-borne diseases

Women highlighted health benefits of milk, poor awareness of disease risks:

• “People drinking milk don't have problem. Rather, people who don't drink milk get sick”.

• “We haven't seen milk related sickness. We haven't had any problem because of the milk from our animals. We use it to raise our children. We are not aware that one can get disease from milk” (IDI 11)

• “…The milk itself is medicine. Fresh milk can be recommended for TB patients” (IDI 8).
Results

Microbiological results

- *E. coli*: 51.7%
  - mean count $5 \times 10^5$ CFU/ml.
- *E. coli O157:H7*: 2.5%
- *Staphylococcus aureus*: 10.8%
- *Listeria spp*: 1.5%
Conclusion

Various risk behaviours identified, thus need to:

• Closely engage with local communities to improve their understanding on milk safety risks

• Facilitate a change in practices

• Measuring the effect on milk safety of changed practices

→ involve women in research
better lives through livestock

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