

## Feed The Future Innovation Lab For Livestock Systems

# Improving Handling Practices and Microbiological Safety of Milk and Milk Products in Borana Pastoral Communities, Ethiopia

## Project background

Borana is a pastoral area in southern Ethiopia where milk is a common food. A recent study involving participatory qualitative investigation on the topic focused on four village administrations of the Yabello district in the Borana zone, and microbiological assessment focused on *E. coli* count and selected other pathogens along different levels of the milk value chain. The observation of milk handling and processing practices revealed apparent unhygienic conditions, and high pathogen loads. Pastoral women considered proper smoking of containers and utensils, using various plant species, as an important traditional practice for assuring the quality and safety of milk and dairy products. Other reasons for smoking mentioned were: increased shelf life of products, good consistency of curdled milk, and pleasing flavor and health benefits. The goal of this project is to improve handling practices of milk and dairy products and thus improve food safety for pastoralists in Borana.



## Project objectives

- Assess the effect of using stainless steel milk storage containers and smoking of containers on the microbial quality and shelf-life of milk and yoghurt.
- Assess the knowledge, attitude and practices (KAP) of women with regard to milk consumption and handling, and the associated health risks focusing on microbial pathogens (before and after giving training on good milk production practices).
- Generate evidence on the prevalence of foodborne bacterial pathogens circulating in milk and milking environments in pastoral and agro-pastoral areas of Ethiopia focusing on *E. coli* O157, *Staphylococcus aureus* and zoonotic *Salmonella* spp.
- Assess the suitability of aluminum containers for preparation of traditional yoghurt in terms of the amount of aluminum metal leached into yoghurt and determine level of aluminum metal residue in the product for potential health risks.

## Expected outputs/outcomes

- Validation and improved traditional milk handling and processing technologies in pastoral areas using a rigorous scientific approach
- Recommendations for improving small-scale milk processing in pastoral areas
- Participating pastoralists to improve their milk handling procedure, which can contribute to family health and increase food security.
- Capacity and capability strengthened, including training at master's level
- Strong partnership among multi-stakeholders in the pastoral areas

## Project focus area

The study will be carried out in Borana Zone of Oromia Regional State, southern Ethiopia. The Borana area is inhabited by agro-pastoral and pastoral communities and livestock production is the main livelihood of the people. The project will focus on testing different interventions to improve the microbiological quality and safety of milk/milk products and raise the awareness of the pastoral people to reduce their risky milk consumption behavior. Pastoral women will be trained on good milk hygienic practices (including mastitis management) and risk of milkborne zoonotic diseases. Thereafter, the effect of the training on knowledge and attitude of the women will be assessed. Effect of smoking of milk utensils on microbiological quality and safety will also be assessed at either field or laboratory.

## Methodological approaches

<ul style="list-style-type: none"><li>➤ 120 women keeping dairy animals will be trained on good practices of milk handling and consumption</li><li>➤ KAP will be assessed two times (immediately after training and 4-5 months after training)</li></ul>	<ul style="list-style-type: none"><li>➤ Effect of smoking on the microbial load of yoghurt (Lab experiment, simulating traditional method)</li><li>➤ Three plants<ul style="list-style-type: none"><li>• ejersa (<i>Olea europaea</i> subsp. <i>africana</i>)</li><li>• daanse (<i>Faurea speciosa</i>)</li><li>• birreessa (<i>Terminalia brownii</i>)</li></ul></li></ul>	<ul style="list-style-type: none"><li>➤ Microbiological analysis<ul style="list-style-type: none"><li>• In connection with the proposed interventions (i.e. improved storage and smoking effect)</li><li>• milkborne pathogens in milk and feces of dairy animals (<i>E. coli</i> O157 and <i>Salmonella</i>).</li></ul></li></ul>	<ul style="list-style-type: none"><li>➤ Aluminum containers will be used for preparation of yoghurt and amount of potentially leached aluminum will be determined</li></ul>	<ul style="list-style-type: none"><li>➤ A participatory experiment will be carried to assess the suitability of using stainless-steel milk containers (supposedly easy to clean) for the preparation of yoghurt. Comparison in microbial load of the yoghurt will be determined</li></ul>
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## Lead institutions

The project is co-led by Principal Investigators (PI):

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## Co-PI and collaborating institutions

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