Research Application Summary

Handling practices and microbiological safety associated with pastoral traditional fermented milk (*Suusa*) product for rural and urban market in Kenya

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Abstract

Suusa is a fermented camel milk product produced and consumed in the arid and semi-arid lands (ASAL) of Northern and Eastern Kenya. It is produced as a small-scale commercial commodity in these areas but has found its way to urban markets. Currently, there are *suusa* consumer safety concerns about the product, making it difficult to penetrate deep in the urban markets, yet it has economic potential. This study seeks to analyse the microbial safety of *suusa* produced and marketed from pastoral environments. Purposive sampling will be used to select women, women groups and value chain actors who are involved in the production and trade of *suusa*. The participants will be interviewed using a semi structured questionnaire on indigenous *suusa* processing and the constraints they encounter. Samples will be collected and analysed for microbial quality along the value chain. Analysis of variance (ANOVA) will be performed to determine whether there are any differences in the microbial counts along the value chain. This study will offer assurance on risks and hazards and nutritional quality to enhance wider acceptability of the indigenous processed camel milk product *suusa.* The output of this project will be used to inform producers on ways of producing safe and high quality *suusa*. In the long run this should facilitate more market access for the product.

Key words: Camel, consumer safety, food safety, milk, *suusa*

Résumé

Suusa est un produit laitier fermenté de chameau, produit et consommé dans les zones arides et semi-arides (ASAL) du Nord et de l'Est du Kenya. Ce produit est une marchandise commerciale à petite échelle dans ces zones mais il a trouvé une ouverture vers les marchés urbains. Actuellement, il y a des inquiétudes sécuritaires des consommateurs de *suusa* concernant le produit, le rendant difficile à pénétrer profondément dans les marchés urbains ; néanmoins, il a un potentiel économique. Cette étude vise à analyser l'innocuité microbienne de *suusa* produit et commercialisé en provenance

des environnements pastoraux. L'échantillonnage délibéré sera utilisé pour sélectionner les femmes, les groupes de femmes et les acteurs de la chaîne de valeur qui sont impliqués dans la production et le commerce du *suusa*. Les participants seront interrogés en utilisant un questionnaire semi-structuré sur le traitement indigène du *suusa* et les contraintes qu'ils rencontrent. Des échantillons seront prélevés et analysés pour la qualité microbienne le long de la chaîne de valeur. L'analyse de la variance (ANOVA) sera effectuée afin de déterminer s'il y a des différences dans les comptes microbiens le long de la chaîne de valeur. Cette étude offrira une assurance sur les risques et les dangers, et la qualité nutritionnelle pour renforcer une plus grande acceptabilité du produit indigène traité de lait de chameau *(suusa)*. Les résultats de ce projet seront utilisés pour informer les producteurs sur les moyens de produire le produit *suusa* non dangereux et de bonne qualité. À long terme, ceci devrait faciliter au produit plus d'accès au marché.

Mots clés: chameau, sécurité des consommateurs, sécurité alimentaire, lait, *suusa*

Background

Lactating camels are able to produce five to ten times more milk than a cow under similar conditions. With this, there has been increased production of camel milk which is informally marketed as fresh or soured milk (*suusa*) in the rural and urban areas. *Suusa* is a spontaneously fermented camel milk product that is consumed by communities producing it. Handling practices carried out in the pastoral environment such as pooling of milk from different suppliers without prior testing poses a threat to human health. Its sensory attributes and quality have also not been standardised. However, due to urbanisation, *suusa* has penetrated the market and is being sold to communities who are used to it that have migrated to urban centres. In some areas, the product has penetrated high value niche markets. There is therefore need to add value to it by assessing its quality and microbial safety.

Literature Summary

The camel (*Camelus dromedarius*) is very important in the arid and semi-arid areas of Kenya and other similar agro-ecologies in the Sahel. Camel milk and its products provide diet to the population in the arid and semi-arid lands (ASAL) of Northern and Eastern Kenya where milk production from other livestock species is very low. In these communities, camel milk is usually consumed raw, thus, posing a public health hazard. Raw milk easily gets colonised by bacteria which may have

come from the teat canal, an infected udder (clinical or subclinical mastitis, respectively) or as contaminants (Matofari *et al*., 2007). In addition, any products made from this milk may carry spoilage and pathogenic microorganisms. Fermented camel milk product, *suusa* is produced under unhygienic environmental conditions with poor quality water. This is made worse because of the poor mode of transportation to the market (Matofari *et al*., 2007). Safety of the product as a result of poor hygiene greatly discourages consumers from purchasing the product (Ihekoronye and Ngoddy, 1985).

Study Description

This project will conduct participatory analysis, bringing together pastoral women, regulatory authorities, associations promoting indigenous food processors and and consumers. The proposed study area is Isiolo and Marsabit counties of Northern Kenya. Traditional handling practices and market chain analysis will be done using a single-visitmultiple-subject diagnostic survey. Purposive sampling will be used to target women who are familiar will camel husbandry and involved in the production and trade of *suusa*. Households will be selected based on accessibility of the village and willingness of the camel owners to take part in the interview. Information about traditional preservation methods; milk marketing; and types of spoilage and shelf life of camel milk will be obtained by means of a semi-structured questionnaire. *Suusa* samples will be collected and analysed for presence of hygiene indicators (*Escherichia coli),* spoilage bacteria *(Pseudomonas* spp., *micrococcus* spp.*),* other pathogens (especially the *cocci* group) and yeast and mould counts. Nutritional quality of *suusa* will be determined based on the method of preparation.

Research Application

An inception workshop with stakeholders was organised at Isiolo's Agricultural Training Centre in April 2012 with the aim of collecting information along the value chain of indigenous knowledge food processed milk products in the pastoral environment. In the survey of the study area, the chain actors were identified and so were the market channels. An informal focus group discussion revealed the traditional technologies applied to *suusa* processing and the challenges faced along the value chain. Some of these challenges were access to market for the processed *suusa,* lack of reliable transport and storage facilities and inadequate packaging amongst others. During the survey, by observation, practices that posed a risk were identified such as poor hygienic conditions and long distance of transportation of raw milk from production areas. Use of

inappropriate containers for storage and transportation was also cited.

Acknowledgement

Special thanks to RUFORUM for funding this project.

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