

# University of Prince Edward Island

Faculty of Veterinary Medicine  
Summary of Dissertation

Submitted in Partial Fulfilment  
of the Requirements for the

## DEGREE OF MASTER OF SCIENCE

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## Prevention of bovine mastitis through a combination of cow comfort and mastitis interventions on smallholder dairy farms in Kenya

Subclinical mastitis (SCM) and cow comfort (CC) are ongoing problems on smallholder dairy farms (SDF) in Kenya. The research involved 124 lactating cows on 114 SDFs in Kenya with the following objectives: 1) to determine factors associated with SCM; 2) to investigate compliance with farm-specific CC and SCM recommendations; and 3) to determine impacts of compliance on CC and SCM.

Farms were visited twice, two months apart. On the first visit, the CC status of sleeping stalls was assessed, cows were inspected for hygiene, and quarters were tested for SCM using the California Mastitis Test (CMT). Farms were randomly placed into either intervention (n=78) or control groups (n=46), and intervention farms were given farm-specific SCM and CC recommendations (focused on milking hygiene and stall comfort, respectively). On the second visit, cows and stalls were re-assessed. Regression models were utilized to explore associations between cow- and farm-level factors and compliance with recommendations, along with SCM and CC.

On the first visit, quarter-level prevalence of SCM was 21.9% (103/471). The proportions of stalls and cow legs scored as dirty were 33.1% and 49.1%, respectively. Low parity and poor stall hygiene were significantly associated with SCM.

The average compliances with CC and SCM recommendations were 49.0% and 77%, respectively, with an overall average of 63.2% for all recommendations. Improving stall hygiene (83.3%), creating ample leg space (76.9%) and making the stall base soft and dry (76.3%) had the highest compliance scores.

Minor recommendations and low numbers of recommendations were significantly associated with higher recommendation compliance. Bedding type, neck rail positioning, and the intervention group were significantly associated with CC improvements. Quarter CMT scores were more likely to improve with women farmers over 50 years old who complied with at least 40% of recommendations. Farmers can improve CC and SCM with appropriate recommendations.

## **Publications**

Kariuki, E. N., VanLeeuwen, J. A., Gitau, G. K., McKenna, S. L., Heider, L. C., Keefe G., Muckle A., & Kathambi E. K. (2022) Cross-sectional study of cow comfort and management factors associated with subclinical mastitis in smallholder dairy farms in Kenya. *East African Journal of Science, Technology and Innovation*, 3(3). <https://doi.org/10.37425/eajsti.v3i3.448>. Kariuki, E. N., VanLeeuwen, J. A., Gitau, G. K., Heider, L. C., McKenna, S. L., & Muasya, D. W. (2023). Randomized control trial to investigate compliance with, and impacts of, cow comfort recommendations on smallholder dairy farms in Kenya. *Research in Veterinary Science*, 162, 104954. <https://doi.org/10.1016/j.rvsc.2023.104954>.

## **Presentations**

1. N'GANG'A EK, VANLEEUVEN J, GITAU GK, MCKENNA SL, HEIDER LC, KEEFE GP, MUASYA DW. Investigating compliance with cow comfort and mastitis control recommendations and their subclinical mastitis outcomes on smallholder dairy farms in central Kenya. Kenyan Veterinary Association 2023 Conference. Kakamega, Kenya.
2. NG'ANG'A EK, VANLEEUVEN J, GITAU GK, HEIDER LC, MCKENNA SL, KEEFE GK, KATHAMBI E. Cross-sectional study of cow comfort management factors and outcomes in small holder dairy farms in Kenya. ISVEE 2022, Halifax, Canada.
3. KARIUKI EN, VANLEEUVEN J, GITAU GK. Assessment of compliance with and impact of cow comfort recommendations in smallholder dairy farms in Kenya. Kenyan Veterinary Association 2022 Conference. Naivasha, Kenya

## **Biographical Data**

Born in Kikuyu, Kiambu Country, Kenya

## **Awards**

Queen Elizabeth II Diamond Jubilee Scholarship – funding for MSc at UPEI