4th International Congress of the Turkish Journal of Agriculture - Food Science and Technology TURIAE 2025

ID: 332

Development of a Practical Model to Evaluate the Influence of Abiotic Factors on Subclinical Mastitis in Dairy Farms in Albania.¹

Roland Mecaj^{1,2}, Majlind Sulce¹, Florian Plaku¹, Geri Muca¹, Renis Maçi³, Enkelejda Sallaku¹, Etleva Delia¹, Xhelil Koleci¹ & Myqerem Tafaj^{1*}

> ¹Agricultural University of Tirana, Albania, 1029, Tirana, Albania ²National Authority of Veterinary and Plant Protection, 1017, Tirana, Albania ³Institute of Food Safety and Veterinary, 1027 Tirana, Albania

> > Corresponding author: mtafaj@ubt.edu.al

Abstract

Background and aim of study: Mastitis poses a major challenge in Albanian dairy farming, with subclinical mastitis (SCM) causing significant economic losses due to undetected infections. It results from interactions among environmental factors, pathogens, and host immunity. Contagious pathogens are often transmitted during milking, whereas environmental sources include bedding and manure. Research and practice have primarily concentrated on contagious microorganisms, with limited exploration of environmental factors affecting mastitis susceptibility and treatment efficacy. In Albanian dairy farms, subclinical mastitis (SCM) is frequently underdiagnosed due to insufficient awareness among farmers and veterinary professionals. Additionally, a standardized national surveillance system for SCM prevalence is absent. A comprehensive approach integrating both biotic and abiotic factors, as demonstrated in other countries, is crucial for addressing this issue under real farm conditions. Therefore, this study is undertaken with the aim of developing a practice-relevant methodological model for farmers and professionals to conduct an integrated assessment of the biotic and abiotic factors contributing to the occurrence of subclinical mastitis in dairy farms in Albania.

Methodology: This model quasi-protocol integrates a range of practical tools, including questionnaires for both quantitative and qualitative data collection, direct testing on dairy farms and animals, and rapid analytical methods for milk and feed samples. Additionally, professional evaluations from veterinarians or animal science experts are conducted, with findings communicated to farmers in an simple practical format. The implementation of the protocol involves the following steps: 1st step) collection of farmer information; 2nd) random selection of cows for testing; 3rd) on-farm assessment of clinical mastitis, udder and milking hygiene, and stable hygiene; 4th) administration of the California Mastitis Test (CMT); 5th) collection of milk samples from cows with subclinical mastitis (SCM) for agent investigation and rapid physicochemical testing; and 6th) evaluation of herd feeding status and feed quality through organoleptic assessment and rapid analysis using NIRS equipment.

Results: This practical model was tested in a study on nine Holstein dairy farms in Albania, spanning both lowland regions (Durrës and Shkodra) and hilly areas (Korça). The study involved measurements taken over 8 months of lactation, up to the onset of the dry period. On each farm, 6-10 cows in lactations 1-3 were randomly selected for CMT tests and milk sampling. The average productivity parameters were as follows: herd size ranged from 21 to 140 cows; daily milk production ranged from 12 to 30 kg; and the average days in lactation were 32-83 for the first measurement, 146-213 for the second, and 241-300 for the third. To assess the relationship between subclinical mastitis (SCM) and milk physicochemical properties under real farm conditions, no changes were made to housing, hygiene, or feeding practices, though these factors were documented. Variance and regression analyses using SPSS were conducted to evaluate the influence of biotic and abiotic factors on SCM and their interactions with other variables. The study concludes that this protocol is practical and easily applicable on Albanian dairy farms, for veterinarians, zootechnicians, and trained farmers alike.

Keywords: subclinical mastitis; dairy cows; biotic and abiotic factors;

¹ This research was funded by the Albanian National Agency of Scientific Research & Innovation (NASRI-AKKSHI, project no. 974/2023). We express our gratitude to MSc. Eva Selmani for her assistance in conducting feed and milk analyses, as well as to the dairy farms that provided all the necessary conditions for the implementation of this study on their farms.



