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The impact of mineral nutrition, udder hygiene, and housing practices on subclinical mastitis under production conditions in Albanian dairy farms.[1]

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Abstract

Background and aim of study: Subclinical mastitis (SCM) represents a major health challenge in Albanian dairy farms; however, its management is frequently overlooked, characterized by limited diagnostic monitoring and a predominant reliance on conventional antibiotic-based treatments. Preventive strategies and awareness regarding abiotic risk factors—such as mineral nutrition, milking hygiene, and housing conditions—remain minimal, despite their well-documented role in the environmental transmission of mastitis pathogens. To date, few studies conducted in Albania have systematically investigated these factors. This study aims to assess the influence of key risk abiotic factors, namely mineral nutrition, milking hygiene, and housing conditions on the prevalence of SCM under real production conditions in dairy farms across various regions of Albania.

Methodology: The study was conducted on nine Holstein dairy farms in Albania, located in both lowland and hilly regions (herd sizes ranged from 21 to 140 cows; daily milk yields ranged from 12 to 30 kg). Data collection extended over an eight-month period during lactation. On each farm, a group of 6 to 10 cows in early lactation was randomly selected and monitored throughout all three stages of lactation. To evaluate the association between abiotic factors (mineral supply, udder hygiene, and housing conditions) and the occurrence of subclinical mastitis (SCM), no changes were made to existing farm management practices. Data were collected using a standardized protocol that included structured questionnaires on farm characteristics and feeding practices, as well as on-farm assessments of housing conditions, udder hygiene, and the application of the California Mastitis Test (CMT). Mineral content in feed samples was determined. Variance and regression analyses using SPSS were conducted to evaluate the influence of biotic and abiotic factors on SCM.

Results: The observed average prevalence of subclinical mastitis (SCM), defined as the percentage of cows with a CMT score of ≥1+ relative to the total number of animals tested, was 37.2% (range: 6–72%). This prevalence was significantly influenced by the level of mineral nutrient intake, assessed through the concentrations of Ca, P, Zn and Se per kilogram of dry matter (DM) intake (average daily DM intake of 20.9 kg/cow). Higher dietary Ca concentrations were significantly associated with a reduction in SCM prevalence ($P = 0.013$). An increase in Se concentration resulted in a quadratic decrease in SCM incidence ($P = 0.066$), while elevated Zn intake showed a trend toward reduced SCM prevalence. In contrast, P concentrations showed no effect on SCM occurrence. Udder cleanliness and teat infection status were both significantly associated with SCM occurence ($P = 0.01$ and $P = 0.001$, respectively). Post-milking teat disinfection demonstrated a highly significant effect in reducing SCM prevalence ($P = 0.001$). SCM occurrence was significantly lower in free-stall housing systems compared to tethered systems ($P = 0.001$). The use of stationary milking systems was also significantly associated with a lower prevalence of SCM compared to mobile milking units ($P = 0.001$).

Keywords: *subclinical mastitis; dairy cows; mineral nutrition; udder hygiene; housing conditions;*

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