Investigation of Subclinical Mastitis and the Role of Non-aureus Staphylococci in a Dairy Farm with Chronically Elevated Bulk Tank Milk Somatic Cell Count - Abstract

Konstantinos Themistokleous[1], Nikolaos Panousis[1], Georgios Arsenos[1], Antonios Zdragas[2], Efstratios Souglis[3], Nektarios Siachos[1], Georgia Koutouzidou[4], Theodoros Kallitsis[1], Evangelos Kiossis[1]

[1]Faculty of Veterinary Medicine, School of Health Sciences, Aristotle University of Thessaloniki, 54124, Greece; e-mail: konsthem@vet.auth.gr
[2]National Agricultural Research Foundation—NAGREF, Veterinary Research Institute of Thessaloniki, 57001, Thermi, Greece
[3]Dairy Department, American Farm School of Thessaloniki, 57001, Thermi, Greece
[4]Department of Applied Informatics, University of Macedonia, 54636, Thessaloniki, Greece

Summary

The objectives were to retrospectively evaluate subclinical mastitis (SCM) in a farm with persistently elevated bulk tank milk (BTM) somatic cell count (SCC), and to investigate the role of non-aureus staphylococci (NAS) among cows with chronic SCM. The study was performed in a dairy farm with a history of chronically elevated BTM SCC, with 120 Holsteins milked twice daily. Initially, a retrospective evaluation of SCM was performed, based on monthly individual and BTM SCC reports, provided by dairy herd improvement (DHI) program, from 2015 until 2018. SCC cut-off used to determine SCM was preset at 250,000 cells/mL. Cows were grouped in DHI reports by lactation number (1st, 2nd, ≥3rd) and stage [0-60, 61-120, 121-180, ≥181 days in milk (DIM)], and herd as a whole. SCM prevalence was calculated as the monthly percentage of cows over the cut-off, per herd, lactation number and stage. Chronic SCM prevalence was calculated as the percentage of cows over the cut-off in ≥2 sequent monthly reports, per herd, lactation number and stage. A "dynamic" group of chronically high SCC cows was created. In the second part of the study, the farm was visited monthly during 2019 by the same team to assess the "dynamic" group and collect samples for milk cultures. Monthly DHI reports were available for monitoring of this "dynamic" group throughout 2019. Cows with SCC below cut-off in a new monthly recording were removed from the "dynamic" group and new cows exceeding cut-off in ≥2 sequent recordings entered the "dynamic" group. The retrospective analysis (2015-2018) revealed an overall SCM prevalence of 46%. SCM prevalence in ≥3rd lactation cows was 60%, with 87% of them being chronic cases. SCM prevalence was noticeably high at 1st lactation cows (18%). Half of cows at late lactation (≥181 DIM) had SCM and almost all were chronic cases. Incidence rate of new infections at early lactation (0-60 DIM) was 4 times higher than later stages. On

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average, 8 out of 120 milking cows were responsible for more than 50% of somatic cells in the BTM in each monthly recording in 2019. Approximately 60% of these cows remained high SCC contributors for ≥2 months and 87% were chronic SCM cases. Among these cows, 59% were at late lactation and 65% were in ≥3rd lactation. Overall, 52 cows were monitored in the chronically high SCC group, either for a single month or more. After a year of monthly milk cultures, this group was identified as major-pathogens free (Staph. aureus, Str. uberis, Str. agalactiae and Str. dysgalactiae). Non-aureus staphylococci (Staph. chromogenes, Staph. hyicus, Staph. warneri, Staph. epidermidis) were involved in 44% of chronically high SCC cows, either solely (26%) or in mixed infections (18%) with other pathogens (mainly, Corynebacterium bovis, E. coli and Bacillus licheniformis). Infections caused solely by the latter pathogens were 30%. In 26% of all samples no pathogen was isolated. High somatic cell contributors in BTM were mainly cows with chronic SCM being in ≥3rd lactation and at late lactation stage. NAS were involved in the majority of chronic SCM cases. In compliance with literature, presence of NAS in these cows seems to play an inhibiting role against major pathogens.

Keywords: Dairy cows; subclinical mastitis; non-aureus staphylococci; milk somatic cell count.

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