



Federal Science Center  
for Animal Husbandry  
named after  
Academy Member L.K. Ernst



PSX-B-21

## DIAGNOSIS OF MASTITIS IN THE EARLY STAGES OF DISEASE DEVELOPMENT: SOMATIC CELLS AND BACTERIAL PATHOGEN

Olga Artemeva, Nikanova D.A. Kositsin A.A., Lashneva I.A., Ignatieva L.P., Sermyagin A.A., Zinovieva N.A.

### Introduction

In dairy cattle, mastitis is a disease of the mammary gland caused by pathogens such as bacteria, viruses, fungi, and algae. Mastitis is characterized by infections of the mammary gland that have multiple etiologies and are most frequently caused by bacteria, which trigger an inflammatory response. In recent years, biomarkers for the mastitis diagnosis have been actively studied.

The aim of the study was to assess the relationship between SCC and pathogenic bacteria in milk occurrence.

### Material and methods

The study carried out by milk samples collected in the experimental herd (Krasnodar region, Russia) from 85 Holsteinized Black-and-White cows. Healthy cows (HC), cows at risk for clinical mastitis (RCM), subclinical (SCM) and clinical mastitis (SM) groups were divided by a bacteriological cultivation and SCC level (Fossomatic7 DC). SCC results were logarithmically converted to SCS.

Group	HC	RCM	SCM	CM
SCS	<4.1	4.2-5.3	5.4-6.3	>6.3
No. of cows	4	22	25	34

Identification of isolated bacteria species was carried out by conventional biochemical methods using the API20E, APIStaph, API20Strep tests (bioMerieux SA, France). The antibiotic susceptibility was determined according to NCCLS and EUCAST.

### Results

Number of isolated pathogenic bacteria in CM group was 57 strains of which 33.3% were attributed to Enterobacteriaceae, 45.6% to coagulase-negative staphylococci (CONS), 12.3% to *S.aureus* and 8.8% to *Ps.aeruginosa*. In SCM group there were assigned 48 strains: 32.5% to Enterobacteriaceae strains, 42.5% to CONS, 20.0% to *S.aureus*, 5.0% to *Ps.aeruginosa*. The antibiotic susceptibility was determined according to NCCLS and EUCAST. *S.aureus* isolates showed the highest sensitivity to erythromycin (4.3% of resistant strains) and the highest resistance to ciprofloxacin (100%), tetracycline (95.0%), rifampicin (88.5%), benzylpenicillin (79.3%), novobiocin (69.2%) and fusidic acid (65.5%).

**Conclusion:** The primary analysis of SCC and milk microbiological profile can be able to increase the accuracy of mastitis occurrence diagnosing that contributes to taking the right decision for choosing an antibiotic to preserve the cows' health.

**Acknowledgments:** this work was supported by the Russian Science Foundation (project No. 21-76-20046).

**Contacts:** Olga Artemeva: [vijmikrob@mail.ru](mailto:vijmikrob@mail.ru); Daria Nikanova: [dap2189@gmail.com](mailto:dap2189@gmail.com)

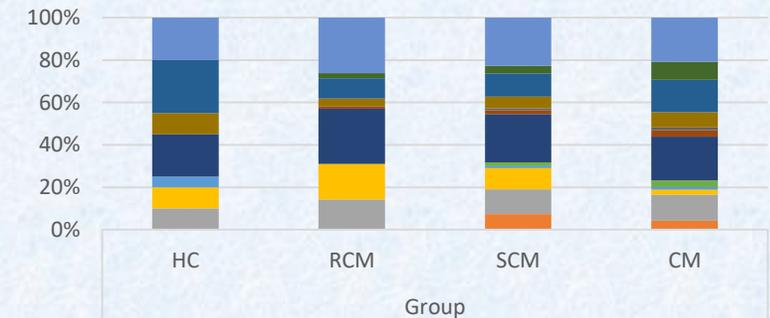


Fig. 1.. Prevalences of known bacterial species in each group of milk samples (HC, SCS<4.1; RCM, 4.2<SCS<5.3; SCM, 5.4<SCS<6.3; CM, SCS>6.3).