

Acknowledgements

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List of Abbreviations

Abbreviations	Elaborations
%	Percentages
≥	Greater than or equal to
≤	Less than or equal to
95% CI	95% Confidence Interval
ANOVA	Analysis of variance
BA	Blood agar
BFDA	Bangladesh dairy farmers association
BMSCC	Bulk milk somatic cell count
BHB	Brain Heart Infusion Broth
CFU	Colony forming unit
CM	Clinical mastitis
CVASU	Chattogram Veterinary and Animal Sciences University
DLS	Department of livestock services
ES	Environmental streptococci
et al.,	and others
GDP	Gross domestic product
IDF	International Dairy Federation
IMI	Intramammary infection
MAC	MacConkey agar
MALDI-TOF	Matrix assisted laser desorption/ionization time of flight
MIC	Minimum inhibitory concentration
MR test	Methyl Red test
MRSA	Methicillin resistant <i>Staphylococcus aureus</i>
MSA	Mannitol salt agar
NAS	Non-aureus staphylococcus
NMC	National mastitis council
OR	Odd ratios
PCR	Polymerase chain reaction
PRM	Packaged raw milk
PRTC	Poultry Research and Training Centre
SCC	Somatic cell count
SCM	Sub-clinical mastitis
SVA	National Veterinary Institute, Sweden
TBC	Total bacterial count
TCC	Total coliform count
TESC	Total environmental streptococcal count
TSC	Total staphylococcal count
VP test	Voges-Proskauer test
µg	microgram

Abstract

Dairying is an important source of subsidiary income generation for farmers in Chattogram. At present, there is an enormous development in the dairy sector. But milk quality issues are a concern among milk consumers and producers who collect milk from Chattogram. Although, measures have been taken to increase the quality of milk has not been thoroughly evaluated in this area.

A cohort study was conducted on 24 randomly selected commercial dairy farms with 72 samples (3 samples from each of 24 farms with 2 months interval) in Chattogram for six months (from May to October 2018) and data were recorded using validated questionnaire. The aims of the study were to determine the hygienic quality and zoonotic hazard of bulk milk by measuring somatic cell count (SCC) and total bacterial count (TBC), determination of prevalence of *Staphylococcus (S.) aureus* and the proportion of MRSA isolated from *S. aureus*, and by assessing the relation between bulk milk somatic cell count (BMSCC) and other farm factors.

The BMSCC varied from 291,000 - 1,156,670 cells/mL and TBC varied from 400-1,890,567 CFU /mL of milk during three repeated counts. The prevalence of *S. aureus* was 16.7% (95% CI: 4.7 to 37.2%) and methicillin resistant *S. aureus* (MRSA) was 8.3% (95% CI: 1 to 27%). Two isolates were MRSA and found resistant against penicillin, oxacillin, cefoxitin, gentamicin and tetracycline. Negative correlation ($r=-0.71$; $p=0.07$) was estimated for total staphylococcal count (TSC) vs. BMSCC at Pearson's correlation. In a linear regression model, own stock as replacement was positively correlated ($p=0.09$) with lower level of BMSCC. This study suggests that dry floor condition and introducing own stock at dairy herds can reduce bulk milk somatic cell count. Findings of this study shows that the bulk milk at Chattogram are contaminated with multidrug resistant *S. aureus* which can be a potential risk of MRSA infection which is a great concern for both human and animal health.

Keywords:

Bulk milk somatic cell count, quality of milk, total bacterial count, methicillin resistant *Staphylococcus aureus*.