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Early Detection and Prevention of Sub - Clinical Mastitis in Cows Using TANUVAS - Masti-Guard Kit

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Abstract

A study was conducted in lactating dairy cows in Karur District of Tamil Nadu using MASTI - GUARD kit released by TANUVAS, which comprises of somatic cell count kit and teat protect spray. In the present study, a total of 81 dairy cows owned by 35 progressive dairy farmers who maintained at least 4 dairy cows were selected randomly from five different blocks of Karur district for screening subclinical mastitis. Out of 81 lactating dairy cows screened for sub - clinical mastitis, 44 (54.32%) were positive and 37 (45.68%) were negative. Teat protective spray was applied to 44 animals, which were positive for sub - clinical mastitis. Reduction in somatic cell count were observed in 12 cows (27.27 %) during the first week, 11 (25%) cows during the second week, 16 (36.36 %) cows during the third week, 3 (6.82%) cows during the fourth week whereas in 2 (4.55%) cows during the fifth week, there was no response at all even after a period of five weeks. From this study, TANUCHEK SCC test was found as user friendly and hence it could be used as regular mastitis screening test and to reduce the incidence of sub clinical mastitis in dairy cows by spraying the teat protective liquid spray.

Key words: Dairy animals, Mastitis, Somatic cell count

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Mastitis, inflammation of the udder, is a challenging problem in dairy animals accounting for high economic losses. The complexity of mastitis lies not only in its varied causes but also in its potential economic repercussions for dairy industry. Effective diagnostics play a vital role in identifying mastitis early, preventing its spread, and minimizing economic losses linked to reduced milk production, treatment costs, and the risk of culling affected animals (Chakraborty *et al*. 2019). Inflammation of mammary gland is directly accompanied by an increase of somatic cell count (SCC) in milk (SCC) Rodriguez *et al*. (2000).This elevation in SCC serves as an important indicator of the inflammatory response occurring within the udder, making SCC a valuable marker for assessing udder health and diagnosing disease conditions. It is a convenient and reliable diagnostic method (Pati *et al*. 2015). The significance of somatic cell count (SCC) in assessing intra-mammary infection (IMI) and overall milk quality, hygiene, and mastitis control is well-established (Sharma *et al*. 2007). Somatic cells, naturally present in milk, increase notably in response to mammary gland infections. In healthy udders, the SCC in milk typically ranges between 50,000 and 100,000 cells per ml, as reported by Skrzypek *et al*. (2004). However, when the SCC exceeds 200,000 cells per ml, it is often considered a threshold indicating a transition from a healthy to a diseased udder, according to the same study. The study aim to compare the somatic cell count (SCC) in the milk of lactating dairy cows using the MASTI-GUARD kit. This comparison will help assess udder health based on SCC at the

field level. This kind of comparative analysis can provide insights into the effectiveness and reliability of the MASTI-GUARD kit in diagnosing and monitoring udder health by measuring SCC in milk samples from lactating cows.

Materials and Methods

Selection of animals

A total of 81 dairy cows owned by 35 dairy farmers from five different blocks of Karur district of Tamil Nadu were screened for subclinical mastitis.

Somatic cell count determination

MASTI - GUARD kit produced by Tamil Nadu Veterinary and Animal Sciences University, Chennai was used in this study which comprises of TANUCHEK SCC and Teat protect (an unique germicidal teat protective spray that prevents the entry of common mastitis causing microbes via teat canal and also provides extended antimicrobial protection). Before collecting milk samples, the teats were washed properly and first two streams of milk were discarded. Milk samples were collected from all the four quarters of each lactating dairy cow in a separate clean container. From the container, a drop of milk sample was taken using a Pasteur pipette and added to a tube provided in the kit. Immediately, three drops of the enhancer was added and mixed well and kept at room temperature for 30 minutes. A blue colour developed was compared with the TANUCHEK SCC colour card supplied with the kit (Fig. A). The value obtained after matching with the colour card was multiplied by 1000 to determine the Somatic cell count per ml of milk.

Results and Discussion

Out of 81 lactating dairy cows screened for sub - clinical mastitis, 44 (54.32%) were positive and 37 (45.67%) were negative. Among the positive animals where protective spray was applied, reduction in somatic cell count was observed in 12 cows (27.27 %) during the first week, 11 (25%) cows during the second week, 16 (36.36 %) cows during the third week, 3 (6.82%) cows during the fourth week whereas in 2 (4.55%) cows during the fifth week, there was no response at all even after a period of five weeks. This might be due to improper application of the teat spray.

The TANUCHEK SCC Test seems to offer equal benefits in terms of low cost, availability, and adaptability when compared to CMT, except for the longer time required for sample analysis.

The TANUCHEK SCC Test's advantage lies in its precise detection of increased SCC. This aligns with the findings from Sharma *et al.* (2007) and Hoque (2013), reinforcing the accuracy and reliability of the test. Despite the longer analysis time (30-40 minutes) for the TANUCHEK SCC Test compared to the CMT, its ability to accurately detect SCC changes and correlate with established research findings seems to be a significant advantage.

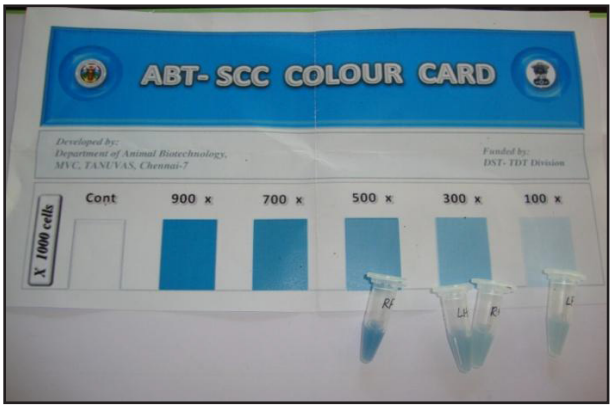

Fig : A TANUCHEK SCC TEST - Colour developed by the test is compared with the score card

There is a great significance of somatic cell count (SCC) in monitoring udder health and milk quality. SCC tends to rise in correlation with udder inflammatory conditions, primarily due to an increase in leukocytes, including macrophages, lymphocytes, and especially neutrophils. During inflammation, the influx of neutrophils leads to a significant rise in SCC, with over 90% of the cells being polymorphonuclear leukocytes (PMN leukocytes) during this period. Jones (2006) highlighted a critical point: as SCC increases, so does the risk of raw milk contamination with pathogens and antibiotic residues, indicating the importance of maintaining a healthy SCC level for good milk quality. Yasothai (2017) suggested using the TANUCHEK SCC Test and CMT for regular mastitis screening, even by individuals with less training in field conditions that underscores

their practicality. The TANUCHEK SCC Test's ease of interpretation and specificity, attributed to the specific substrate changing to a blue color due to membrane-bound enzymes from cells, makes it a valuable tool for such screening. Moreover, its cost efficiency at Rs. 2.50 per test enhances its suitability for routine screening in practical settings.

This information highlights the crucial role of SCC in assessing udder health and the suitability of TANUCHEK SCC for efficient mastitis screening in field conditions, even by personnel with minimal training.

Conclusion

From this study, it can be inferred that the TANUCHEK SCC test could be a valuable tool for mastitis screening in dairy cows, even in field conditions. This test seems to be user friendly and provides easily interpretable results, making it a potentially effective way to regularly screen for mastitis. Implementing such a screening process could indeed help in reducing the occurrence of subclinical mastitis in dairy cows by identifying potential cases early and allowing for timely intervention, such as applying teat protective liquid spray.

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References

Hoque. M.M, (2013). Comparison between California Mastitis Test and Somatic Cell Count as Diagnostic Tools for Bovine Sub - clinical Mastitis.M.V.Sc., Thesis Submitted to Bangladesh Agricultural University, Mymen Singh.

Jones, G.M (2006). Understanding the Basics of Mastitis.Virginia Cooperative Extension.Publication No. 404-233. Virginia State University, USA, pp: 1-7.

Patil, M.P, Nagvekar, A.S, Ingole, S.D, Bharucha, S.V and Palve V.T. (2015). Somatic cell count and alkaline phosphatase activity in milk for evaluation of mastitis in buffalo. *Vet. World*. **8**(3) : 363–366. doi: 10.14202/vetworld.2015.363-366

Rodriguez, S.I, Gianola, D and Shookg, E, (2000). Evaluation of Models for Somatic Cell Score Lactation Patterns in Holsteins.*Livestock Prod. Sci*, **67**: 19-30. https://doi.org/10.1016/S0301-6226(00)00193-7

Sharma, N, Gupta, S.K, Sharma, U and Hussain, K.(2007). Treatment of Clinical Mastitis in a Buffalo: A Case Report, *Buff. Bull.* **26**(2): 56-58. : https://www.researchgate.net/publication/285079982

Skrzypek, R, Wtowski, J and Fahr, R.D, (2004). Factors Affecting Somatic Cell Count in Cow Bulk Tank Milk - A Case Study from Poland. *J. Vet. Med. Anim. Physiol. Pathol. Clin. Med*.**20**. DOI: 10.1111/j.1439-0442.2004.00611.x

Yasothai, R, (2017). Comparison of Diagnostic Tests for the Detection of Sub-Clinical Mastitis in Dairy Farms of Erode District. *Int. J.Sci.Env. Tech*, Vol. **6**(2) : 1321 – 1326. https://www.ijset.net/journal/1685.pdf