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T Geetha

Assistant Professor, Livestock
Farm Complex, Veterinary
College and Research Institute,
Udumalpet, Tamil Nadu, India

A Kirubakaran

Professor and Head, Livestock
Farm Complex, Veterinary
College and Research Institute,
Udumalpet, Tamil Nadu, India

C Manivannan

Dean, Veterinary College and
Research Institute, Udumalpet,
Tamil Nadu, India

Evaluation of bovine subclinical mastitis based on somatic cell count in different farming systems

T Geetha, A Kirubakaran and C Manivannan

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Abstract

Incidence of sub clinical (SCM) was studied during the period from April 2022 to January 2023 in the various organized and unorganized small scale private dairy units (<10 animals) located in and around Tirupur district of Tamil Nadu. A total of 48 cows were examined in both organised (18 animals) and unorganised farms (30 animals), of which 25 cows were found positive for SCM in both farms. The incidence of SCM was 61.11 per cent (11 animals) and 70.00 per cent (21 animals) in organized and unorganized farms respectively. In the present study, the incidence of grade I SCM in organized and unorganized farms were 36.4 and 52.4 per cent respectively, and grade III SCM accounted for 63.6 and 33.3 per cent in the respective farms. Based on this study the incidence of subclinical mastitis in organized and unorganized small scale farms are almost similar and the grade III subclinical mastitis is comparatively less in unorganized farms.

Keywords: Somatic cell count, subclinical mastitis, different farming systems

Introduction

Mastitis is one of the most prevailing diseases of high yielding dairy animals. It has been recognized for more than a century and still continues to be an evergreen cause of economic loss (Patil *et.al.*, 2000) [7]. A dairy herd without mastitis is virtually impossible under modern intensive farming condition. Subclinical mastitis (SCM) is more important than clinical mastitis (CM), because it causes huge economic losses, which is often undetected and given less importance than CM (Schukken *et al.*, 1995) [10]. In India, the estimated loss due to udder infections was Rs 6053.21 crores and out of which 70-80 per cent of losses attributed to subclinical mastitis (Dua, 2001; NAAS, 2013) [2, 6]. Which is an alarming situation for the dairy sector. In this situation early identification of SCM in dairy cows are warranted.

Somatic cell count (SCC) is a useful predictor of intra-mammary infection (IMI) and udder health status, hygiene and mastitis control. It is a measure of the nucleated cells in the milk, which is good indicator of both resistance and susceptibility of cows to mastitis and can be used to monitor the level or occurrence of SCM in dairy herds or individual cows. Somatic cells are mainly milk-secreting epithelial cells that have been shed from the lining of the gland and white blood cells (leukocytes) that have entered the mammary gland in response to injury or infection. During inflammation (mastitis) the major increase in SCC is due to the influx of neutrophils into the milk to fight infection and estimated at over 90 per cent (Harmon, 1994) [4]. Normally, the SCC is lower than 1×10^5 cells / ml in milk from a healthy mammary gland, but bacterial infection can increase it to above 1×10^6 cells /ml (Bytyqi *et al.*, 2010) [1]. Therefore, somatic cell count plays a crucial role in early detection of subclinical mastitis. Hence the present study was carried out to be detecting the incidence of subclinical mastitis in organized and unorganised farms by somatic cell count using an automatic cell counter.

Case History and Observations

The study was carried out during the period from April 2022 to January 2023 in the various organized and unorganized small scale private dairy units (<10 animals) located in and around Namakkal district, Tamil Nadu. A total of 48 animals of which 18 from organized farms and

Corresponding Author:

T Geetha

Assistant Professor, Livestock
Farm Complex, Veterinary
College and Research Institute,
Udumalpet, Tamil Nadu, India

30 from private unorganized dairy units were selected for this study. Milking was done twice daily by milking machine in organized farms and full hand milking in all the unorganized private farm units. However, towards the end of the milking, strip milking was also practiced by the milkers.

Before collection of sample, teats were cleaned thoroughly and disinfected by 70 per cent ethyl alcohol. Screw capped sterile tubes of 15 ml capacity were used for collection of milk samples. About 10-12 ml of milk was collected after discarding the first few stripping from each quarter and cap was replaced tightly. The milk sample were kept in ice box and brought to the laboratory as soon as possible for further processing.

The somatic cell count was carried with all the milk samples by using Porta SSC milk test strips and automatic somatic cell counter. Based on the somatic cell count the SCM was graded as grade I, GRADE II, grade III (Patil *et al.*, 2015) [8].

Treatment and Discussion

Milk somatic cell counts (SCC) were recorded from all the

milk samples collected from the cows in different stage of lactation and the incidence of subclinical mastitis in different farms are shown in Table I. A total of 48 cows were examined in both organized (18 animals) and unorganized farms (30 animals), of which 32 cows were found positive for SCM in both farms (organised farm n = 11/18; unorganized farms n=21/30). The incidence of SCM was 61.11 and 70.00 per cent in organized and unorganized dairy farms, respectively. The result of SCM observed in organized farms is consistent with the observation of saxena *et al.* (1993) [9]. In unorganized farms, the incidence is comparable to the earlier findings of Mubarak *et al.* (2012) [5] who observed the prevalence of mastitis at cow level as 66.0 per cent, out of which 26.06 and 75.30 per cent were clinical and subclinical mastitis, respectively. In the present study, the incidence of grade I SCM in organized and unorganized farms were 36.4 and 52.4 percent respectively, and grade III SCM accounted for 63.6 and 33.3 per cent respectively.

Table 1: Incidence of SCM in organized and unorganized farms

Groups	No. of cows Examined	No. of cows positive for SCM	Incidence rate (%)	Grade I (2-6 x 10 ⁵ cells/ml)	Grade II (6-8 x 10 ⁵ cells/ml)	Grade III (8-10 x 10 ⁵ cells/ml)
Organized farm	18	11	61.11%	4(36.4%)	-	7 (63.6%)
Unorganized farm	30	21	70.00%	11(52.4%)	3(14.3%)	7 (33.3%)

All lactating animals have a low baseline SCC even if they do not have intramammary infections. When an infection is detected by the immune system in a healthy buffalo or cow a rapid influx of leukocytes will quickly raise the SCC far beyond the baseline level, usually more than a million cells/ml (Hallen *et al.*, 2008) [3]. Somatic cell count could be considered as an important tool for early diagnosis of subclinical mastitis, milk quality and hygienic conditions of a dairy herd.

Summary

The study revealed that the incidence of subclinical mastitis in organized and unorganized small scale farms are almost similar and the grade III subclinical mastitis is comparatively less in unorganized farms. These findings clearly indicate that continuous intrusion of scientific knowledge on importance of udder health, the loss due to subclinical mastitis and culling of older cows with repeated mastitis by field extension people have created awareness among the farmers of small scale dairy units.

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Conflict of Interest

Not available

Financial Support

Not available

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