Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.7684

ISSN: 2582 – 2845

Ind. J. Pure App. Biosci. (2019) *7*(4), 385-389

Research Article

Indian Journal of Pure & Applied Biosciences

Relationship between Parity, Period of Calving, Season and Incidence of Mastitis in a Hariana Cattle Dairy Farm

Rajeshwar Dayal, Rajbir Singh*, Nazim Ali and D. S. Sahu

Department of Animal Husbandry, Sardar Vallabh Bhai Patel University of Agriculture and Technology, Meerut Uttar Pradesh, India

*Corresponding Author E-mail: rajbirsinghsvbp@gmail.com

Received: 8.06.2019 | Revised: 15.07.2019 | Accepted: 22.07.2019

ABSTRACT

Mastitis in dairy animals is the most frequently reported disease all over the world. The most common treatment of this condition is use of antimicrobials, which poses risk of development of antimicrobial resistance. Prevention of mastitis is always considered better than its treatment. For controlling the diseases, there is a prerequisite of identification of risk factors of mastitis in Haryana breed of cattle. The data about the livestock farm, breeding and management of animals was collected at Government Livestock Farm, Gastinapur, Meerut during the visit. A total of 258 Hariana cows lactating cows for their 983 calving records over 25 years (1992-2016) were studied for the incidence of mastitis and related risk factors. The incidence of clinical mastitis was found to be 16.68 percent in this herd. The mastitis incidence was observed to be significantly increased with increase in lactation number from 13.37 percent among first calver to 19.75 percent in third calver and it was similar (17.83 percent and 17.67 percent) in fourth parity and fifth & later lactations. The incidence of mastitis was found highest in rainy season (27.57%) and lowest in autumn season (12.84%). The overall incidence of blood in milk was found 3.66 percent. The incidence of blood in milk did not varied significantly with the parity, period of calving and season. It can be concluded that the occurrence of mastitis in rainy season during late lactation period were more prevalent especially in lower parities. The present study was able to confirm some risk factors factors to reduce the probability of mastitis occurring in Hariana cows, with particular relevance for the dairy farms in the state.

Keywords: *Clinical Mastitis, Cow, Lactation, Season, Parity, Hariana.*

INTRODUCTION

Mastitis in dairy animals is the most common economic problem for the growth of the dairy industry (Sharma et al., 2015, Kutar et al., 2015). This leads to reduction in the milk yield, poor quality of milk, increased rate of culling and additional cost for the treatment of animals such as veterinary services, treatment etc (Firth et al., 2019). There is various etiology of mastitis in animals like bacterial, viral, fungal, managemental, genetic etc (Deb et al., 2013).

Cite this article: Dayal, R., Singh, R., Ali, N., & Sahu, D.S. (2019). Relationship between Parity, Period of Calving, Season and Incidence of Mastitis in a Hariana Cattle Dairy Farm, *Ind. J. Pure App. Biosci. 7*(4), 385-389. doi: http://dx.doi.org/10.18782/2320-7051.7684

Apart from that production stage of animal, parity, lactation number, herd management, and various environmental factors *viz.*, temperature, humidity and season play significant role in the occurrence of mastitis (Olde Riekerink et al., 2007, Nyman et al., 2007). Thus, it is not possible to completely eradicate the disease. So, the reduction in its incidences may be achieved by vaccinating the animals or controlling the risk factors for the disease by good management practices (Sharma et al., 2015, Rahman et al., 2009, Sharma et al., 2016, Yadav et al., 2018). Understanding the season and lactation period and patterns of mastitis will be helpful in reducing the occurrence of disease in dairy farm (Moosavi et al., 2014).

The objectives of this study were to use data from large dairy farm located in Hastinapur, Meerut to compare the occurrence of clinical mastitis in different seasons, stages of lactation period and parities in Haryana cattle.

MATERIALS AND METHODS

2.1 Data collection: The study was conducted on Hariana cows maintained at Government Livestock Farm, Hastinapur, Meerut, Uttar Pradesh from by obtaining data of 983 calving records of 258 adult cows over a period of 25 years (1992-2016). The animals were kept in semiintensive system and fed with mineral mixture according to age and concentrate ration as per the milk production. The animals were hand milked twice a day after proper washing of teats and udder. The ill animals were kept separated and treated by the veterinarian. All the animals were vaccinated against foot-and-mouth disease and hemorrhagic septicemia. The data on lactation disorders were collected from different registers/reports. The data was spread and classified according to the parity of lactation, periods and calving season.

a) ***Parity of lactation***: The parities of animals were considered upto the last parity in the history sheet of animal.
b) ***Period of calving***: The data of 25 years were divided in to 5 periods viz., 1992-96, 1997-2001, 2002-06, 2007-11 and 2012-16.
c) ***Season of calving***: The climatic conditions were also grouped into winter (December to March), summer (April to June), Rainy (July to September) and Autumn (October to November).

2.2 Statistical analysis: The data gathered from the farm was entered in the Microsoft Excel worksheet. The prevalence of mastitis in the animals was calculated in the percentage of mastitis affected animal over the total lactating animals. The significance of the effect of various non genetic factors *viz.* parity, period and season of calving on various lactation disorders were estimated by the analysis of variance (F-test).

RESULTS AND DISCUSSION

The data on the incidence of mastitis and blood in milk in relation to non genetic factors and their statistical analysis have been presented in table 1 and 2, respectively. The incidence of clinical mastitis was found to be 16.68 percent in this herd and it was found within the range reported in previous studies (Mukharjee et al., 1993, Tesfaye & Shamble, 2013, Getaneh & Gebremedhin 2017, Rathod et al., 2017). The mastitis incidence was observed to be significantly increased with increase in lactation number from 13.37 percent among first calver to 19.75 percent in third calver and it was similar (17.83 percent and 17.67 percent) in fourth parity and fifth & later lactations (Table 1). This increase in mastitis incidence with parity has also been reported by various researchers (Patil et al., 1995). in buffaloes. On the contrary, previous studies (Mukharjee et al., 1993, Shinde et al., 2001). have indicated that parity of lactation did not influence the incidence of mastitis. The period of calving was not significantly related with incidences of mastitis in animals (Table 2). Similarly, previous study (Patil et al., 1995). had also found that period could not influence the incidence of mastitis. However, previous study (Tomar & Tripathi, 1984). reported that period had significant effect on mastitis incidence. The incidence of mastitis

was found highest in rainy season (27.57%) and lowest in autumn season (12.84%) (Table1). The analysis of the data have indicated that season of calving had significant effect (P<0.01) on the incidence of mastitis (Table 2). Previous study reported the higher incidence of mastitis in rainy season (Shinde et al., 2001). whereas another study (Tomar & Tripathi, 1984). have found that the incidence of mastitis was low in rainy season and high in winter season. Season had no effect on the incidence of mastitis (Mukharjee et al., 1993, Patil et al., 1995).

The overall incidence of blood in milk was found 3.66 percent. Previous study (Shinde et al., 2001). found low incidence of blood in milk (1.41) in Murrah buffaloes whereas another study (Mukharjee et al., 1993) reported the incidence of blood in milk to be 5.1 percent in Karan Fries cows. The incidence of blood in milk did not varied significantly with the parity, period of calving and season. Previous studies (Mukharjee et al., 1993, Tomar & Tripathi, 1984). reported that parity order, period of calving and season affected the incidence of blood in milk significantly. The high incidence of blood in milk in older cows have been explained due to weakness of suspensory ligaments as a result of senility, high engorgement of mammary gland as the animals grew older and erythrocytes appear through capillary bleeding (Mukharjee et al., 1993).

Table 1: Incidence (%) of udder problems in relation to non genetic factors

Effects	No of observation	Mastitis	Blood in milk
Overall	983	16.68 (164)	3.66 (36)
Parity			
1	258	13.57 (35)	2.33 (6)
2	202	16.34 (33)	3.47 (7)
3	162	19.75 (32)	4.32 (7)
4	129	17.83 (23)	3.88 (5)
5	232	17.67 (41)	4.74 (11)
Period			
1	86	16.82 (14)	3.49 (3)
2	197	15.73 (31)	3.55 (7)
3	303	16.17 (49)	3.30 (10)
4	217	16.13 (35)	4.15 (9)
5	180	19.44 (35)	3.89 (7)
Season			
Winter	417	13.91 (58)	3.36 (14)
Summer	204	13.73 (28)	2.45 (5)
Rainy	214	27.57 (59)	5.14 (11)
Autumn	148	12.84 (19)	4.05 (6)

Figures in parenthesis are the number of affected cows.

Table 2: ANOVA showing the effect of non-genetic factors on udder problems

Sources of variation	DF	Mastitis	Blood in milk
Lactations	4	0.4375**	0.039
Periods	4	0.0029	0.010
Seasons	3	0.6121**	0.062
Error	971	0.1198	0.029

** P< 0.01

CONCLUSION

In conclusion, it is necessary to focus on diagnosis and treatment of clinical mastitis in Harian cattle in winter season particularly of animals in 5th or more lactation period. Therefore, this study sheds some light on the importance of the mastitis control program as a herd management practice.

Acknowledgements

The authors are sincerely thankful to the Hon'ble Vice Chancellor, Sardar Vallabh Bhai Patel University of Agriculture and Technology, Meerut Uttar Pradesh, India for the financial support on the research.

Conflict of interest statement

The authors do not have any conflict of interests.

REFERENCES

1. Sharma, L., Verma, A. K., Kumar, A., Rahal, A., Neha & Nigam, R. (2015). Incidence and pattern of antibiotic resistance of Staphylococcus aureus isolated from clinical and subclinical mastitis in cattle and buffaloes. *Asian Journal of Animal Sciences, 9*(3), 100-109.
2. Kutar, K., Verma, A. K., Sharma, B., Kumar, A., & Yadav, S. K. (2015). Analysis of mecA gene and antibiotic resistance in Staphylococcus aureus isolates from bovine mastitis. *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases 36*(1), 22-27.
3. Firth, C. L., Laubichler, C., Schleicher, C., Fuchs, K., Käsbohrer, A., Egger-Danner, C., Kofer, J., & Obritzhauser, W. (2019). Relationship between the probability of veterinary-diagnosed bovine mastitis occurring and farm management risk factors on small dairy farms in Austria. *J Dairy Sci*. *102*(5), 452-4463.
4. Deb, R., Kumar, A., Chakraborty, S., Verma, A. K., Tiwari, R., Dhama, K., Singh, U., & Kumar, S. (2013). Trends in diagnosis and control of bovine mastitis: A review. *Pak. J. Biol. Sci*. *16*(23), 1653-1661.
5. Olde Riekerink, R. G. M., Barkema, H. W., & Stryhn, H. (2007). The effect of season on somatic cell count and the incidence of clinical mastitis. *J Dairy Sci*. *90*(4), 1704–1715.
6. Nyman, A. K., Ekman, T., & Emanuelson, U. (2007). Risk factors associated with the incidence of veterinary-treated clinical mastitis in Swedish dairy herds with a high milk yield and a low prevalence of subclinical mastitis. *Prev Vet Med*. *78*(2), 142–160.
7. Rahman, M. A., Bhuiyan, M. M. U., Kamal, M. M., & Shamsuddin, M. (2009). Prevalence and risk factors of mastitis in dairy cows, *The Bangladesh Veterinarian, 26*(2), 54-60.
8. Sharma, L., Verma, A. K., Rahal, A., Kumar, A., & Nigam, R. (2016). Relationship between serum biomarkers and oxidative stress in dairy cattle and buffaloes in clinical and subclinical mastitis. *Biotechnology, 15*, 96-100.
9. Yadav, S., Kumar, A., Yadav, S. K., Singh, V. K., Verma, A. K., Gururaj, K., & Rahal, A. (2018). Formulation of nanoparticle polymer gel based bivalent mastitis vaccine and its safety studies in mice mastitis model. Multilogic in Science. VII (special issue): 262-266.
10. Moosavi, M., Mirzaei, A., Ghavami, M., & Tamadon, A. (2014). Relationship between season, lactation number and incidence of clinical mastitis in different stages of lactation in a Holstein dairy farm. *Vet Res Forum, 5*(1), 13–19.
11. Mukharjee, K., Tomar, S. S., & Sadana, D. K. (1993). Factors affecting reproductive disorders and their association in Karan Fries herd. *Indian J. Dairy Sci*., *46*, 110-113.
12. Tesfaye, D., & Shamble, A. (2013). Reproductive health problems of cows under different management systems in Kombolcha, Noetheast Ehiopia. *Adv. Biomed. Res*., *7*, 104-108.

13. Getaneh, A. M., & Gebremedhin, E. Z. (2017). Meta-analysis of the prevalence of mastitis and associated risk factors in dairy cattle in Ethiopia. *Trop Anim Health Prod*. *49*(4), 697-705.
14. Rathod, P., Shivamurty, V., & Desai, A. R. (2017). Economic Losses due to Subclinical Mastitis in Dairy Animals: A Study in Bidar District of Karnataka, *Indian J. Vet Sci. Biotech*. *13*(1), 37-41.
15. Patil, N. A., Harpanhalli, M. D., Mulia, J. A., Hosmani, S. V., & Pugashetti, B. K. (1995). Comparative study on prevalence and diagnosis of subclinical mastitis in cows and buffaloes. *Indian J. Dairy Sci*., *48*(7), 478-79.
16. Shinde, S. S., Kulkarni, G. B., Gangane, G. R., & Degloorkar, N. M. (2001). Incidence of mastitis in buffaloes in Parbhani Distt., (M.S.). *Proc. Indian Vet. Cong*., 22-23 February, 2001, at PAU, Ludhiana.
17. Tomar, S. S., & Tripathi, V. N. (1984). Inheritance of udder disorders in Muurrah buffaloes. *Indian J. Anim. Genet & Breeding*, *5*, 19-21.