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Adverse effects of subclinical mastitis on milk production in cows

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Abstract
An experiment entitled "Adverse effects of subclinical mastitis on milk production in cows" was conducted to determine the adverse effects of subclinical mastitis on milk production in cross bred lactating cows. This experiment was conducted during May to June, 2018 on a total of 80 lactating dairy cows. The study was designed to estimate the loss of milk due to subclinical mastitis disease collect the milk samples and compare between the total milk productions of subclinical mastitis affected and normal cows in specific time period of 30 days. The identification of subclinical mastitis in milk samples was carried out using Modified California Mastitis Test (MCMT). The total milk production was recorded higher in normal cows as compared to the cows were affected by subclinical mastitis disease.

Keywords: cow, milk production, mastitis, modified California mastitis test

1. Introduction

India ranks first in the world for milk production, where milk production has been raised from 55.7 million tonnes in 1991-92 to 165.4 million tonnes in 2016-17 [7]. This tremendous increase in milk production is attributed to the policies adapted by government. India has a large livestock population including 190.9 million cattle, 76.7 million adult female cattle, 108.7 million buffaloes; 56.6 million adult female buffaloes constitute 299.6 million total bovines, 135.2 million goats and 65.1 million sheep. These constitute 512.1 million total livestock population [6].

Milk is regarded as complete diet for human beings due to its essential components [3]. During last years the demand for liquid milk has increased tremendously worldwide due to increased population growth [4]. India is the largest producer of milk in the world, is set to produce over 165.4 million tonnes milk during 2016-17 with per capita availability of milk 355gms/day [7] as against only 280 gms, recommended by the nutrition experts of Indian Council of Medical Research. Milk production may be affected by mastitis. Similarly, the quality and quantity of milk is affected to varying degrees. Mastitis is not only responsible for great economic losses to the dairy industry but also acts as one of the biggest obstacles in achieving the "White Revolution".

In mastitis, the economic losses are due to reduced milk production, poor quality milk, increased cost of Veterinary services and drugs, shortened productive life of animal and finally its replacement cost. Besides causing huge losses to milk production, the sub clinically affected animals remain a continuous source of infection too the rherdmates [2]. The subclinical form of mastitis in dairy cows is important because it is15 to 40 times more prevalent than the clinical for mandis difficult to detect, reduces milk production and adversely affects milk quality [9]. California Mastitis Test (CMT) is a simple, inexpensive, rapid and highly sensitive test that accurately predicts the inflammatory cell counts in milk from individual quarters or pooled milk samples [5]. The SCC is account used to screen epithelial cells that have been shed from the lining of the gland and white blood cells (leucocytes) that have entered the mammary glands in response to injury or infection [1]. SCC is a useful predictor of subclinical udder infection; therefore, it is considered as an important component for assessing the quality and milk hygiene for mastitis control protocols [9]. The leucocyte count is the basis for most indirect tests employed for diagnosis. Over135 different microorganisms have been isolated from bovine intra mammary infections (IMI), but the majority of infections are caused by *Staphylococcus* spp., *Streptococcus* spp. and gram-negative bacteria [13] Keeping in view these facts this experimental trial was conducted to determine the adverse effect of subclinical mastitis on total milk production.

2. Materials and Methods

The present investigation entitled "Adverse effects of subclinical mastitis on milk production in cows" was carried out at Dairy Farm and Laboratory, Department of Animal Husbandry and Dairying, Banaras Hindu University, Varanasi during May to June, 2018.

2.1 Methods adopted; Collection of animals

Lactating cows were selected for the present series of investigations. All animals were kept on uniform pattern for feeding and management throughout of the experimental period.

2.2 Housing and management

All the experimental animals were housed in well ventilated cattle shed of Dairy farm, Banaras Hindu University, Varanasi on the pattern of tail-to-tail system. Proper sanitation of the cattle shed was maintained by cleaning it twice day. The animals were left out for grazing and exercising during the day for few hours.

2.3 Feeding of animals

Well balanced ration as per their requirement and fresh drinking water was regularly provided to all the animals each day during experimental period.

2.4 Milking of animals

Just after calving the cows were hand and machine mulched twice a day both morning and evening at regular intervals throughout the lactation period. The amount of milk produced by each cow was individually recorded every day in the milk record register. The lactation yield was considered as the milk produced by a cow in 305 days.

2.5 Sampling of milk

For analysis 100 ml, freshly drawn milk from each quarter of the cows was collected separately in clean, well sterilized and previously dried sample bottle. The samples were taken from morning and evening milking at regular interval for laboratory analysis. Before withdrawing portion for chemical analysis milk samples were brought to the temperature of 68°F (room temperature) and mixed thoroughly into a clean receptacle in order to get homogenous samples.

2.6 Tests used for detection of subclinical mastitis

Modified California Mastitis Test (MCMT) was used to detect subclinical mastitis. MCMT was performed by [8]. Milk affected with subclinical mastitis shows higher number of polymorph nuclear leucocytes which get degenerated due to chemicals present in MCMT reagent and milk sample shows increase in viscosity. This is the basic principle used in MCMT.

2.7 Analysis of milk samples

Milk samples were collected from cows of Dairy Farm, Department of Animal Husbandry and Dairying subjected to know the decrease in the milk production of subclinical mastitis affected cows as compared to none affected. Analyses of milk samples were done at laboratory, Department of Animal Husbandry and Dairying, Banaras Hindu University, Varanasi for the detection of subclinical mastitis. The individual milk samples of cows were recorded daily to know the loss in milk production due to subclinical mastitis.

2.8 Statistical Analysis

At tabular analysis of collected data was used to accomplish the objectives of study. A Student 't' test used to test the significance between normal milk and subclinical mastitis milk of cows described by [12].

3. Results

The present investigation was conducted to investigate the loss in milk production by subclinical mastitis affected cows during May, 2018 at Animal Farm, Department of Animal Husbandry and Dairying, Banaras Hindu University, Varanasi. The experimental findings are discussed below.

3.1. Milk production

The milk production of 20 sub clinically affected and 20 normal cows of same age and weight were recorded for the period of 31 days of May, 2018 and the difference between them was calculated to report the adverse effect of subclinical mastitis disease on milk production.

Table 1: Milk production of subclinical mastitis affected and normal cows

Type of cow	Milk Production			
	Number of Normal Cow (Liter)	Total Milk Production of 30 Days (Liter)	Number of Subclinical Mastitis affected Cow (Liter)	Total Milk Production of 30 Days (Liter)
Crossbred cows	494	297	489	226
Crossbred cows	523	366	515	227
Crossbred cows	538	386	545	175
Crossbred cows	550	342	563	132
Crossbred cows	554	267	568	188
Crossbred cows	603	312	606	174
Crossbred cows	604	316	613	130
Crossbred cows	605	304	637	178
Crossbred cows	607	316	639	142
Crossbred cows	610	285	653	160
Crossbred cows	612	315	666	198
Crossbred cows	617	309	668	143
Crossbred cows	621	334	673	179
Crossbred cows	622	390	760	134
Crossbred cows	625	360	764	145
Crossbred cows	640	392	766	199
Crossbred cows	647	369	768	119
Crossbred cows	649	322	789	214

Crossbred cows	762	380	798	260
Crossbred cows	767	313	800	214
Average	-	333	-	171
Significant at 5% level	't' cal = 7.01			

The data of this table 1 showing that a significant decrease were recorded in the total milk production of sub clinically affected cows as compared to total milk production of normal cows. There was about 48.6% drop in total milk production of 20 cows of the same age and weight of 31 days of May, 2018.The maximum milk production was recorded of normal cow number 640 (392 liter) as compared to other cows. The maximum decrease was recorded in the milk production of sub clinically mastitis affected cow number 766(99 liter). The data regarding milk production of cows reduced due to mastitis. The values of milk production in table are the mean of 62 samples of morning and evening from May1 to 31, 2018.

4. Discussion

To estimate the loss of milk production due to subclinical mastitis disease; total milk collected and their weight was recorded. The comparison of milk production data of subclinical mastitis affected and normal cows in specific time period of 30 days indicating that a significant decrease was noticed in the total milk production of sub clinically affected cows as compared to none sub clinically affected cows. Our results are supported by finding of [11], they showed that a significant decrease in the total milk production of sub clinically affected cows as compared to normal cows.

5. Conclusion

This study was concluded that the subclinical mastitis infected cows were found to reducing the percentage of milk production. The reason behind occurrence of subclinical mastitis is due to the interaction between microbial agent, host and environmental factors at dairy farm, Banaras Hindu University, Varanasi. Time to time milk samples of every cows of dairy should be tested to knows the cows are infected or non-infected by this mastitis disease because the milk of mastitis affected cows are also harmful to consumers.

6. Acknowledgements

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7. References

1. Bradley A. Use and interpretation of somatic cell count data in dairy cows. In Practice. 2005;27:310-315.
2. Islam MA, Islam MZ, Islam MA, Rahman MS, Islam MT. Prevalence of Subclinical Mastitis in Dairy Cows in selected areas of Bangladesh. Bangladesh Journal of Veterinary Medicine. 2011;9(1):73-78.
3. Javaid A, Shafique S, Shafique S. Invasion of noxious alien weed *Parthenium hysterophorus* L. in grazing lands of Lahore, Pakistan Journal of Animal and Plant Science. 2009;19:149-153.
4. Klaas IC. Untersuch ungenzum Auftreten von Mastitiden und zur Tiergesundheit in 15 Milch viehbetrieben Schleswig-Holsteins. Dissertation, Free University Berlin, 2000.
5. Madut NA, Gadir AE, Jalii AIM. Host determinants of bovine mastitis in semi-intensive production system of Khartoum state, Sudan. Journal of Cell and Animal Biolology. 2009;3(5):7177.
6. National Dairy Development Board report: Data: milk production in India. 2012. In http://www.nddb.org/information/stats/milkprodindia
7. National Dairy Development Board report: Total livestock population of India, 2017 http://www.nddb.org/information/stats/pop
8. Pandit AV, Mehta ML. Sodiumlauryl sulphateasa substitute for CMT reagent California Mastitis Test Reagent) for diagnosis of subclinical mastitis in buffaloes. Indian Veterinary Journal. 1969; 46:111-119.
9. Seegers H, Fourichon C, Beaudeau F. Production effects related to mastitis and mastitis economics in dairy cattle herds, Veterinary Research. 2003; 34:475-491.
10. Sharma N, Singh NK, Bhadwall MS. Relationship of somatic cell count and mastitis: an overview. Asian Australian Journal of Animal Science. 2011;24(3):429-438.
11. Sinha MK, Thombare NN. Incidence and impacts of clinical mastitis in dairy cattle farms: case of Maharashtra farmers, 2013.
12. Snedecor GW, Cocharan WG. Statistical methods. 6th edn. Oxford and IBH Publishing Co., New Delhi, 1968.
13. Tenhagen BA, Koster GB, Wallmann J, Heuwieser JW. Prevalence of Mastitis Pathogens and Their Resistance against Antimicrobial Agentsin Dairy Cows in Brandenburg, Germany. Journal of Dairy Science. 2006;89:2542-2551.