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An Analytical Study on Mastitis in Cows under Climatic Conditions of Tonk district

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Abstract

Mastitis is the problem in milch animals which affects the quality and quantity of the milk. The study was conducted in cows of at 8 blocks (Newai, Tonk, Deoli, Uniara, Todarai singh, Malpura, Peeplu and Dooni) and dairy unit (250 cows) of Banasthali Vidyapith, Tonk district of Rajasthan. mastitis status in Newai block was 8 cases in 2014-15, 17 cases in 2015-16, 16 cases in 2016-17, 21 cases in 2017-18 and 18 cases in 2018-19 in the district. The overall average (16) of mastitis case in this block was highest than other blocks of the district due to poor quality of drinking water and less availabity, dirty stall, infected animals, calf sucking, open group milking, bad milking method and grazing of the animals. Mastitis status in the Tonk block was 12 cases in 2014-15, 15 cases in 2015-16, 18 cases in 2016-17, 11 cases in 2017-18 and 13 cases in 2018-19. It was less effective compare than Newai block due to awareness of the farmers and availability of sufficient amount of water and good quality. The overall average (13.8) was lower than Newai, Toda rai singh, Malpura and Peeplu blocks. The overall average (11.6) of mastitis status in Uniara block was slightly poor due to dirty stall and poor management of dairy units. The overall average (14.2) of mastitis case in this block was medium than other blocks of the district due to poor quality of drinking water and less availabity, dirty stall, infected animals, calf sucking, open group milking, bad milking method and grazing of the animals. The overall average (11.4) of mastitis status in Dooni block was slightly poor due to trained farmers and good management of dairy units. Environmental factors, poor management and lack of awareness about mastitis was responsible to mastitis. Performance of Devli block was excellent in field conditions and dairy unit of Banasthali Vidyapith in farm conditions.

Key words: Analytical Study, Mastitis, Cows, Climatic Conditions, Tonk

Introduction

Mastitis in dairy cows is the persistent, inflammatory reaction of the udder tissue. Mastitis, a potentially fatal mammary gland infection, is the most common disease in dairy cows in the United States. It is also the most costly to the dairy industry. Milk from cows suffering from mastitis has an increased somatic cell count. Mastitis occurs when white blood cells (leukocytes) are released into the mammary gland, usually in response to bacteria invading the teat canal. Milk-secreting tissue and various ducts throughout the mammary gland are damaged due to toxins released by the bacteria. Mastitis can also occur as a result of chemical, mechanical, or thermal injury. This disease can be identified by abnormalities in the udder such as swelling, heat, redness, hardness, or pain (if it is clinical). Other indications of mastitis may be abnormalities in milk such as a watery appearance, flakes, or clots. When infected with subclinical mastitis, a cow does not show any visible signs of infection or abnormalities (Wikipedia, 2016).

Milk-secreting tissues and various ducts throughout the udder can be damaged by bacterial toxins, and sometimes permanent damage to the udder occurs. Severe acute cases can be fatal, but even in cows that recover there may be consequences for the rest of the lactation and subsequent lactations. The illness is in most respects a very complex disease,

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affected by a variety of factors: it can be present in a herd *subclinically*, where few, if any, symptoms are present in most cows. Practices such as close attention to milking hygiene, the culling of chronically-infected cows, good housing management and effective dairy cows nutrition to promote good cow health are essential in helping to control herd mastitis levels (Dairy Australia, 2016).

All dairy herds have cows with subclinical mastitis; however, the prevalence of infected cows varies from 5%–75%, and quarters from 2%–40%. Many different pathogens can establish a chronic infection in which clinical signs of mastitis will manifest only occasionally. The primary focus of most subclinical mastitis programs is to reduce the prevalence of the contagious pathogens *S agalactiae* and *S aureus*, as well as other gram-positive cocci, most notably *Streptococcus dysgalactiae* (which may also be contagious or an environmental pathogen), *Streptococcus uberis*, enterococci, and numerous other coagulase-negative staphylococci, including *Staphylococcus hyicus*, *Staphylococcus epidermidis*, *Staphylococcus xylosus*, and *Staphylococcus intermedius*. Herds have been identified that have considerable subclinical mastitis caused by gram-negative rods such as *Klebsiella* sp, *Serratia marcescens*, *Pseudomonas aeruginosa*, and other atypical pathogens such as mycotic and algal microbes. For contagious pathogens, adult lactating cow are most at risk of infection, either while lactating or during the dry period. The primary reservoir of infection is the mammary gland; transmission occurs at milking with either milkers' hands or milking equipment acting as fomites. Primiparous heifers have been reported to be infected with staphylococci and streptococci before calving, although the prevalence varies greatly among herds and geographic regions. Teat-end dermatitis caused by the horn fly, *Haematobia irritans*, which can harbor *S aureus*, has been associated with increased risk of infection in heifers, especially in warmer climates. For the contagious pathogens and coagulase-negative staphylococci, there is little or no seasonal variation in incidence of infection (Erskine, 2014).

Soil, manure, bedding, calving pads and water host bacteria that cause environmental mastitis. They also occur on parts of the cow other than the mammary gland. Housed cows tend to be more at risk than grazing cows. The main bacteria are Strep uteri's which can sometimes persist, and can spread at milking. The other culprit is E. coli which does not thrive in the lactating udder and often the infections do not persist. Transition and post-calving cows are very susceptible to these infections because their natural defenses are low. Large infections of environmental mastitis bacteria can contaminate teats, especially if udders are wet and exposed to mud and manure, such as when animals lie down during calving (AHDB, 2016).

Materials and Methods

The area under this study is Tonk District, Rajasthan, which is located in Eastern part of the state between 75 0 07' 00" E to 760 19'00" E and 25 0 41' 00" N to 26 0 34'00" N. The total geographical area covered by the District is 7194 km^2. The climate of the area is semiarid type. The average annual rainfall of the district is 598 mm. The area is having general flat to undulating topography. The Banas River, 135 kms in length, is major one running through Tonk district (Sharma et al., 2015). The study was conducted in cows of at 8 blocks (Newai, Tonk, Deoli, Uniara, Todarai singh, Malpura, Peeplu and Dooni) and dairy unit (250 cows) of Banasthali Vidyapith, Tonk district of Rajasthan. There were treated and diagnose mastitis cases in the districts during five years (2014 - 2019).There were cows were treated and diagnose in the whole district. The data were collected by discussion with the dairy farmers and self-records at Krishi Vigyan Kendra Bansthali Vidyapith Tonk Rajasthan.

Results and Discussion

It was observed from Table 1 that the mastitis status in Newai block was 8 cases in 2014 -15, 17 cases in 2015- 16, 16 cases in 2016- 17, 21 cases in 2017- 18 and 18 cases in 2018 -19 in the district. The overall average (16) of mastitis case in this block was highest than other blocks of the district due to poor quality of drinking water and less availabity, dirty stall, infected animals, calf sucking, open group milking, bad milking method and grazing of the animals.

The results laid down in Table indicated that the mastitis status in the Tonk block was 12 cases in 2014 -15, 15 cases in 2015-16, 18 cases in 2016-17, 11 cases in 2017-18 and 13 cases in 2018-19. It was less effective compare than Newai block due to awareness of the farmers and availability of sufficient amount of water and good quality. The overall average (13.8)

Fig. 1: Identification of mastitis in cows

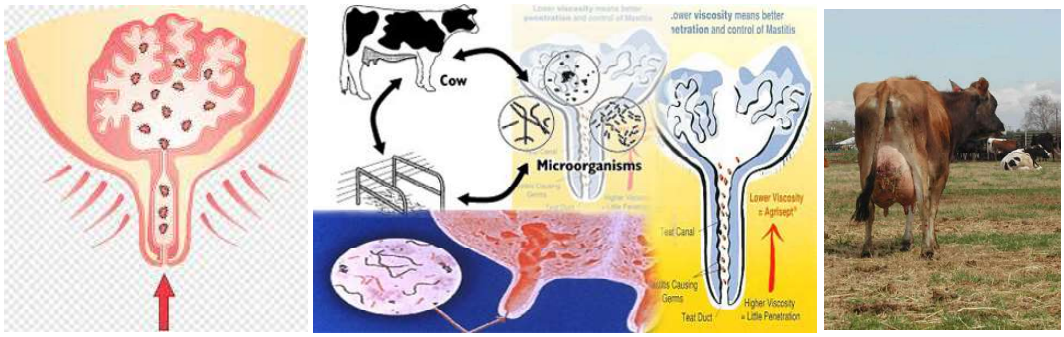

Fig 2: Infection Process of mastitis in cows

Table 1: Mastitis effect and block level analysis in cows

S. No.	Name of Block	Case studied 2014-15	2015-16	2016-17	2017-18	2018-19	Overall Average	Causes
1.	Newai	8	17	16	21	18	16	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
2.	Tonk	12	15	18	11	13	13.8	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
3.	Devli	10	14	10	12	9	11	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
4.	Uniara	6	12	16	14	10	11.6	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
5.	Todarai Singh	11	18	17	15	10	14.2	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
6.	Malpura	12	17	14	13	9	15	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
7.	Peeplu	14	19	20	18	16	15.4	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
8.	Dooni	9	11	9	8	10	11.4	Dirty stall, Infected animal, calf sucking, open group milking and Grazing
9.	Dairy Unit Banasthali	5	4	3	3	1	3.2	Infected animal, calf sucking and open group milking

was lower than Newai, Toda Rai Singh, Malpura and Peeplu blocks.

It is clear from above table that the status of mastitis in Devli block was 10 cases in 2014-15, 14 cases in 2015-16, 10 cases in 2016-17, 12 cases in 2017-18 and 09 cases in 2018 -19 The overall average was lower (11) in the whole district due to Bisalpur water supply, trained dairy farmers and good management of dairy units. The overall average of Devli block was lower than all other blocks.

It is observed from the Table that the overall average (11.6) of mastitis status in Uniara block was slightly poor due to dirty stall and poor management of dairy units.

It was observed from Table 1 that the mastitis status in Todarai Singh block was 11 cases in 2014-15, 18 cases in 2015- 16, 17 cases in 2016-17, 15 cases in 2017-18 and 10 cases in 2018-19 in the district. The overall average (14.2) of mastitis case in this block was medium than other blocks of the district due to poor quality of drinking water and less availabity, dirty stall, infected animals, calf sucking, open group milking, bad milking method and grazing of the animals.

The results laid down in Table indicated that the mastitis status in the Malpura block was 12 cases in 2014-15, 17 cases in 2015-16, 14 cases in 2016-17, 13 cases in 2017-18 and 09 cases in 2018-19. The overall average (15) was medium compare than other blocks of the district due to awareness of the farmers and availability of sufficient amount of water and good quality.

It is clear from above table that the status of mastitis in Peeplu block was 14 cases in 2014-15, 19 cases in 2015-16, 20 cases in 2016- 17, 18 cases in 2017-18 and 16 cases in 2018-19 The overall average was medium (15.4) in the whole district due to Dirty stall, Infected animal, calf sucking, open group milking and Grazing.

It is observed from the Table that the overall average (11.4) of mastitis status in Dooni block was slightly poor due to trained farmers and good management of dairy units.

The results laid down in Table indicated that the mastitis status in the dairy unit Banasthali Vidyapith was 05 cases in 2014-15, 04 cases in 2015- 16, 03 cases in 2016-17, 03 cases in 2017-18 and 01 cases in 2018-19. The overall average (3.2) was lowest compare than other blocks of the district due to scientific management of dairy unit.

The results of the study are similar with Haltia et al 2006 who have reported lowest case in farm management compare than field rearing.

Our findings are agreed with Nordhoug et al 1994 who have reported the udder problem created by dirty stall and poor management of dairy units.

The results of this study are fully corroborated with Kurjogi and Kaliwaln 2014 who have reported that the environmental factors are also responsible to mastitis problem in cows.

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