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Prevalence of Bovine Mastitis in Selected Dairy Farmsof Benadir Region, Somalia.

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Abstract
Mastitis in Cattle is an important animal production disease that affects the dairy industry globally. Somalia is known for its large livestock population in Africa. This study aimed to evaluate the prevalence of bovine mastitis in selected dairy farms andto identify breeds which are susceptible for mastitis according to their age, body condition in different dairy farms of Benadir Region, Somalia.
A cross-sectional study was conducted from 1st January 2020 December 2020, in selected dairy farms of Jamhuriya, Juungal, Oodweyne and Xamar Jadiid of Benadir region, Somalia.
The overall prevalence of mastitis in cattle species were 63.2% positive which indicates that examined cattle having a higher number of positive results when compared to number of negative however there is no statistically significant association ($p < 0.05$). The prevalence of mastitis in 3 years, 3-4 years, 4-5 years and >5 years age groups are 21.3%, 19.9 %, 14.0%, 8.1%, respectively, though the highest number of positive results were seen in 3 years old. In this study, there is no a significant difference observed in the prevalence of mastitis between age groups. According to different body condition, the number of positive is (22%) good, (36%) fair, and (26%) poor.
Our findings indicates cattle with fair body condition are most likely to be affected with bovine mastitis and had a significant association ($P= 0.005$) with bovine mastitis.
In this study displays positive results of different farms in Benadir region affected with cattle mastitis as follows (29%) Jamhuriya farms, (17%) Juungal farms, (20 %) Oodweyne farms and (20%) Xamar Jadiid farms, respectively.

Keywords: *Mastitis, Cattle, CMT, Prevalence*

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I. Introduction

Mastitis, an inflammation of the mammary gland caused by bacterial/microbial infection, trauma, or injury to the udder, remains the most common and expensive disease affecting dairy cattle throughout the world, Mastitis is caused by several different bacteria that can invade the udder, multiply there and produce harmful substances that result in inflammation. Bovine mastitis is an important animal production disease that affects the dairy industry globally. It reduces the productivity of the cow as well as the quality of milk causing enormous losses for breeders and consequently, to the national income of the country. (Tewari, 20 February 2015.).

Mastitis can also be classified as either clinical or subclinical. Clinical mastitis is characterized by sudden onset, alterations of milk composition and appearance, decreased milk production, and the presence of the cardinal signs of inflammation in infected mammary quarters. It is readily apparent and easily detected. In contrast, no visible signs are seen either on the udder or in the milk in case of sub-clinical mastitis, but the milk production decreases and the somatic cell count increases. It is more common and has serious impact in older lactating animals than in first lactation heifers (Khan MZ, J. 2006;26:204–8.).

The diagnosis of sub-clinical mastitis is a challenge in dairy animal management and in veterinary practice (Asmare, No. 13. Rome; 2014.).

In Africa: Ethiopia has the largest livestock population in Africa, where cows are among the huge number of the cattle population, where the milk harvested from these animals serves an important dietary source for most of the rural, urban, and periurban population (O. Williams, 2010).

Nonetheless, milk production from these animals is below its potential failing the demands of the population in the country. The factors that contributed to the poor performance of the dairy subsectors in the

countries include but are not limited to poor productivity, inappropriate technology, poor infrastructures, and inadequate animal feed and animal health services. (DeRosa, 45–68, Addis Ababa, Ethiopia, 1995.).
Nevertheless, the quality and quantity of milk in the country were tremendously declined due to various causes including mastitis.

Mastitis is a multi-etiologic disease of the mammary gland characterized mainly by reduction in milk production and considered an economically important disease in the dairy subsector in developed and developing nations. (L. & A., University of Helsinki, Helsinki, Finland, 1995.).

Studies have estimated the prevalence of this disease an approximately 30% of African countries, with the highest prevalence found in Ethiopia. This is despite the wide cattle distribution in Africa, and the largest number of dairy farms and herds in countries such as South Africa, Kenya and Uganda. Furthermore, the estimated financial losses due to direct and indirect impacts of bovine mastitis are lacking in this continent. Therefore, intensive research efforts will help to determine the continent-wide economic (Thekisoe, 13 June 2017). Here, published cases supporting the occurrence and importance of bovine mastitis in certain regions of Africa are outlined.

In Somalia: Cattle are important milk producers in arid lands and cattle milk is an essential food for livelihood of people and it may be the only milk available in places where other milking animals cannot be maintained. In pastoral conditions, milk is always consumed either fresh or in varying degrees of sourness, in the raw state without heat treatment, and it can pose a health hazard to the consumer. (Abdurahman, 2006).

II. Materials And Methods

2.1 Study Area

Benadir region consists of 17 districts. It borders with middle Shebelle in the north and the east, lower Shebelle in the west and Indian Ocean in the south. The study was carried out in dairy farms located in Benadir region of Somalia. The region lies between latitude 2°2′59″N and longitude 45°15′44″E. Although by far the smallest administrative region in Somalia, it has the largest population estimated to be about 2.3 million and covers an area approximately 96,878 km (Wikipedia, 2018).
There is no information on Benadir Animal population in particular. Therefore, these four districts were selected purposively due to their Animal population. Samples were collected randomly from the semi intensive and intensive dairy herds.
Study design was a cross-sectional study by collecting milk from sampled animals. The prevalence of dairy cattle mastitis considered in study animals were age, breeds, animal species, body scores and their location.

2.2.1 Sample size

136 milk samples were collected from randomly selected 204 animals
Calculation of Confidence Level 95% and Confidence Interval 5%.
The researcher will use Slovene's formula to select the respondents of the study from the population; using the following formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the required sample size, N is the target population size and e is the standard error or level of significance, which is popularly known to be =0.05 or 5%. For this study, N = 204and so the sample size was calculated as follow $n = \frac{204}{1 + 204(0.05)^2} = 136$

2.2.2 Sampling Procedure

The procedure for conducting the CMT is simple. Draw foremilk from each quarter into separate cups of a four-cup plastic paddle. Tilt the paddle to equalize milk quantities in the cups at about 1/2 teaspoon each. Add 1/2 teaspoon of test reagent to each cup. Make sure the use of reagent produced under license to ensure standardized concentration.
Rotate the paddle to mix, and observe changes in color and gel formation within 10 to 15 seconds after mixing. Milk from a normal quarter remains liquid and flows freely. In a moderate reaction, the gel that forms is fragile and breaks into small masses or clumps. Milk samples that react strongly form a gelatinous mass that clings together as the paddle is rotated.

2.3 Sample Collection

To collect sample from lactating cows, the researcher used Put on clean gloves. Label the sample vial with the date, cow ID and quarter to be sampled. RF = right front, LF = left front, RR = right rear, LR = left rear.

2.4 Examination of Milk

The California Mastitis Test (CMT) is a simple, inexpensive, rapid screening test for mastitis. The test is based upon the amount of cellular nuclear protein present in the milk sample.

2.5 Data Analysis

The data was collected through quantitative methods. The data collected from the study area, edited, collated and tabulated. Both MS Excel Windows® 2010 data base and SPSS statistical analysis tool.

III. Results

Table 1: The Overall Prevalence of Cattle Mastitis

Species	No. of animal examined	No. of positive and %	No. of negative and %	P- value
Cattle	136	86 (63.2%)	50 (36.8%)	0.675
Total		136	100%	

Table 1: The overall prevalence of mastitis in cattle species were 63.2% positive which indicates that examined cattle having a higher number of positive results when compared to number of negative however there is no statistically significant association ($p < 0.05$).

Table 2: Prevalence of Cattle Mastitis Based on Age

Ages	Number of cows examined	No. of positive &its percentages	No. of Negative &its percentages	p-value
3yrs	49	29 (21.3%)	20 (14.7%)	0.975
3-4yrs	42	27 (19.9%)	15 (11.0%)	
4-5yrs	27	19 (14.0%)	8 (5.9%)	
>5ys	18	11(8.1%)	7 (5.2%)	
Total	136	86(63.2)	50(36.8)	

Table 2: Age distribution of large ruminants having mastitis are (3yrs, 3-4yrs, 4-5yrs and >5yrs old) however the percentage prevalence of these age categories are 21.3%, 19.9 %, 14.0%, 8.1% respectively , though the highest number of positive results were seen in 3 years olds.

Table 3: Prevalence of Cattle Mastitis Based on Breeds

Cattle breeds	Number of cows examined	No. positive and its%	No. negative and its %	p-value
Local	74	48(35.3)	26(19.1)	0.02
Exotic	61	35(25.7)	27(19.9)	
Total	136	83(61)	53(39)	

Table 3: Positive results in both local and exotic breeds were 35.3% and 25.7% respectively.
This reveals that prevalence of mastitis is higher in local breeds than exotic though prevalence of mastitis in this study area indicates that sex had significant relations ($P < 0.05$) with presence of mastitis.

Table 4: Prevalence of Cattle Mastitis Based on Body Score

Body condition	No of cattle examined	No of positive and its %	No of negative	p-value
Good	30	22	10	0.364
fair	64	36	26	
Poor	42	26	14	
Total	136	86	50	

As shown in the table above different body conditions according to the number of positive are (22%) good, (36%) fair and (26%) poor. Our result indicates that cattle with moderate body condition are most likely to be

affected with mastitis .These results show that body condition had a significant association (P= 0.005) with mastitis in cattle.

Table 5: Prevalence of Cattle Mastitis Based on farm sites

selected farms sites	No. of animal examined	No. of positive	No. of negative	p-value
Jamhuriya farms	40	29	13	0.003
Juungal farms	35	17	18	
Oodweyne farms	30	20	8	
Xamar Jadiid farms	31	20	11	
Total	136	86	50	

In this table display positive results of different farms in Benadir region affected with cattle mastitis as follows (29%) Jamhuriya farms, (17%) Juungal farm, (20 %), Oodweyne farms, (20%) and Xamar Jadiid farms. Percentage prevalence of cattle mastitis in Jamhuriya farms was higher as compared to other farms in Benadir regionin this study. There is no significant difference observed in the prevalence between these farms.

IV. Discussion

This study was conducted betweenJanuary and December 2020, several villages of four districts in Benadir region of Somalia to assess the prevalence of cattle mastitis using CMT(California mastitis test) to asses age, sex, body condition score ,breeds and location.

The percentage prevalence of mastitis in cattle species were 63.2% positive which indicates that examined cattle having a higher number of positive results when compared to number of negative however there is no statistically significant association ($p < 0.05$) . Our results strongly agreed witha study conducted in Ethiopia (Abebe, 2016).

Age distribution of large ruminants having mastitis are (3yrs, 3-4yrs, 4-5yrs and >5yrs old) however the percentage prevalence of these age categories are 21.3%, 19.9 %, 14.0%, 8.1% respectively, though the highest number of positive results were seen in 3 years olds. This findings is contradicted to the study reported by (MAHMMOD, Y. S, 2013). In relation to age susceptibility, 5-8 years old cows (15.43% at the cow level and 4.36% at the quarter level) were susceptible than those of 3-4 years.

Positive results in both local and exotic breeds were 35.3% and 25.7% respectively. This reveals that prevalence of mastitis is higher in local breeds than exotic though prevalence of mastitis in this study area indicates that sex had significant ($P < 0.05$) on mastitis. This study dis agrees with the research reported by (Abdirahman bare Dubad, 2019).

However different body conditions according to the number of positive are (22%) good, (36%) fair and (26%) poor. Our result indicated that cattle with moderate body condition are most likely to be affected with mastitis .These results show that body condition had a significant association (P= 0.005) with cattle mastitis.

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6. Conflict of interest

The authors have declared no conflict of interest

Reference

[1]. Abdirahman Bare Dubad, Mohamed Shiekh Mahmud and Hasan Mohamed Hasan, 2019 Prevalence of Mastitis in Camel, Cattle and Goats at Benadir Region in Somalia

[2]. Abdurahman, O. A. (2006). Udder health and milk quality among camels in the Errer valley of eastern Ethiopia. *livestock research for rural devolopment*.

[3]. Abebe, R., Hatiya, H., Abera, M. *et al*. Bovine mastitis: prevalence, risk factors and isolation of *Staphylococcus aureus* in dairy herds at Hawassa milk shed, South Ethiopia. *BMC Vet Res* **12,** 270 (2016).

[4]. Asmare, K. a. (2016). *solation of Staphylococcus aureus in dairy.* at Hawassa milk shed, South Ethiopia

[5]. Khan MZ, K. A. (J. 2006;26:204–8.). A. Basic facts of mastitis in dairy animals: A review. Pakistan. *Abebe et al. BMC Veterinary Research (2016) 12:270* .

[6]. L. K., & A. J. (University of Helsinki, Helsinki, Finland, 1995.). "Changes in the composition of milk induced by mastits," in The Bovine Udder and Mastitis, M. Sandholm,. *Veterinary Journal, vol. 164, no. 2, pp. 116–128, 2002.*

[7]. MAHMMOD, Y. S. – KLAAS, I. C. – NIELSEN, S. S. – KATHOLM, J. – TOFT, N. 2013. Effect of presampling procedures on real-time PCR used for diagnosis of intramammary infections with Staphylococcus aureus in dairy cows at routine milk recordings. Journal of Dairy Science, vol. 96, 2013, p. 2226–2233.

[8]. O. Williams, D. A. (2010). Livestock and Livestock Characteristics, Agricultural Sample Survey vol. 2, no. 468, Statistical Bulletin,. *(Central Statistical Agency*.

[9]. Tewari, A. (20 February 2015.). BOVINE MASTITIS IA AN IMPORTANT OF DAIRY CATTLE DISEASE. *Dartmouth College · Department of Microbiology and Immunology*.
[10]. Thekisoe, K. R.-M. (13 June 2017). Importance of bovine mastitis in Africa. *Animal Health Research Reviews>Volume 18 Issue 1>Importance of bovine mastitis in Africa*.

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