NSAP 47th Annual Conference (JOS 2022) CONFERENCE PROCEEDINGS
THEME: SECURING ANIMAL AGRICULTURE AMIDST GLOBAL CHALLENGES

PREVALENCE OF MASTITIS OF DAIRY COWS IN KANAM LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA

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Abstract
The study was conducted in Kanam Local Government Area of Plateau state to determine the prevalence of mastitis of dairy cows. Two hundred (200) lactating dairy cows of different breeds at different parities, and stages of lactation were used for the study. The cows were randomly selected from four dairy farms managed intensively and semi-intensively. Milk samples were collected aseptically from all the four quarters diagnosed and were taken for bacteriological examination. Data entry and management was done using Microsoft Excel 2016, while data analysis was done using STATA version15.Descriptive statistics was used to calculate the prevalence of clinical and subclinical mastitis. The result showed that majority(50.94%) of the cows examined were between 4 to 8 years while 19.83% were < 4 years. California Mastitis Test(CMT) test shows that 34 (9.81%) were positive while 90.19% negative. Out of 200 quarter milk samples, 86(9.81%) gave positive reactivity to California Mastitis Test, while 45 (26.28) and 69 (63.9) recorded as doubtful and negative respectively. High prevalence (89.50%) of sub-clinical mastitis according to (CMT) was obtained from farms examined while low prevalence (10.50%) of clinical mastitis was observed. The isolated bacteria were *Staphylococcus spp*. 101 (52.5%), *Streptococcus spp*. 25 (12.3%), *Enterobacterium spp.* 4 (2%), *Lactobacillus spp*. 4 (2%), *Coryneform bacteria* 27 (13.2%), *Micrococcus spp*. 10 (4.9%), *Pseudomonas spp.,* 11 (5.9%), *Bacillus spp.,* 10 (4.9%) and *Aercoccus spp*. 7(3.2%). It was therefore concluded that, there was prevalence of mastitis (89.50%) for the sub-clinical mastitis while low prevalence (10.50%) for clinical mastitis in farms examined. Hygiene measurements were recommended to be followed to reduce mastitis in dairy farms.

Key words: mastitis, dairy, cows and milk

Introduction

Bovine mastitis remains one of the most critical diseases of dairy cows globally (Seegers *et al*., 2003). This disease is of particular concern, especially in Africa, including Nigeria, where there is limited research on mastitis (Cervinkova *et al*., 2013). Apart from the substantial economic losses associated with the disease, mastitis has serious zoonotic potential and has been associated with the increasing development and the rapid emergence of multidrug resistance strains globally (Smith *et al*., 2008). Mastitis, which is the inflammation of the udder and teats, exists in two primary forms: clinical and subclinical mastitis. Clinical mastitis, which is less prevalent, is characterized by systemic signs in the cow and visible abnormalities in the udder and milk. In contrast, subclinical mastitis is more common and results to reduced milk production without observable clinical signs or abnormalities in the udder or milk. For this reason, subclinical mastitis is challenging to diagnose, persists longer in the herd, and is associated with higher losses compared to clinical mastitis.

Bacteria are the primary causes of mastitis, and more than 140 different pathogenic species have been reported (Belayneh *et al*., 2015). Previously, studies had documented major pathogens of mastitis such as *Staphylococcus aureus*, *Streptococcus agalactiae*, and Coliforms. Prompt identification and understanding diversity of pathogens associated with mastitis is essential for effective prevention and control.

Materials and Methods

The study was conducted in Kanam Local Government Area of Plateau State, Nigeria. The study animals were lactating dairy cows of different breeds. During the farm visits, data was collected using a well structured questionnaire administered on each farm through personal interviews.

Milk samples were collected aseptically from all the four quarters and diagnosed using California Mastitis Test (CMT) The samples were sent for bacteriological examination in the laboratory in colders with ice blocks and stored at −20°C until analyzed

The isolation and identification of bacterial pathogens were performed according to the procedure described by Mbindyo *et al*. (2011). Descriptive statistics was used to calculate the prevalence of clinical and subclinical mastitis. Prevalence was calculated as the proportion of sick over the total population that will be analyzed.

Results and Discussions

The results of the study were as presented in Table 1-5

Table 1: Summary of the questionnaire survey responses by owners of the dairy farms in the study area

Unit	Frequency (%)
Common disease	
Mastitis	10 (33.3)
Tick borne diseases	5 (16.7)
Other diseases	15 (50.0)
Tick infestation	
Yes	26(86.7)
No	4(13.3)
Veterinary services	
Yes	30(100)
No	0(00.0)
Herd composition	
Dry	1(3.33)
Fresh	2(6.67)
first calving heifer	1(3.33)
heavy producing cow	26(86.7)
Combination	0(00.0)
Treatment of mastitis	
Yes	30(100)
No	0(00.0)
Type of housing	
free stall	0(00.0)
loose corral	30(100)
Stanchion	0(00.0)
Stall surface	

Concrete	0(00.0)
Mats	0(00.0)
Clay	30(100)
Sand	0(00.0)
Cleaning teat and udder	
Yes	0(00.0)
No	30(100)
Teat disinfectant	
Yes	0(00.0)
No	30(100)
Milking fresh cows with previously infected ones	
Yes	30(100)
No	0(00.0)
Regular examination of cows for mastitis	
Yes	30(100)
No	0(00.0)
Washing hands before milking	
Yes	0(00.0)
No	30(100)
Milk loss due to mastitis	
Yes	29(96.7)
No	1(3.3)
Culling due to mastitis	
Yes	0(00.0)
No	30(100)

Level of hygiene	
Excellent	1(3.3)
Good	14(46.7)
Poor	15(50)
Housing condition	
Excellent	0(00.0)
Good	11(36.7)
Poor	19(63.3)

Table 2: The frequency and percentage of the results of mastitis survey

Unit	Frequency
Total number of animals examined	200
Age (years)	
< 4	11(19.83)
< 8	101(50.94)
< 12	88(29.23)
Stage of lactation(month)	
First (1-3 month)	43(23.08)
Second (4-7 month)	99(46.84)
Third (7-9 month)	58(30.09)
Condition of the animal	
Healthy	150(97.78)
Not healthy	50(2.22)
Milk production(kg) day	
≤ 8	66(42.22)
≤16	111(51.62)
≤ 24	23(6.15)
California Mastitis Test (CMT)	
Positive	30 (9.81%)
Negative	170 (90 .19%)
Presence of mastitis	
Positive	34 (9.81%)
Negative	166 (90 .19%)

Table 3: California Mastitis Test Reaction

CMT	Frequency (%)
+++	22 (2.67)
++	26 (4.60)
+	38 (2.54)
±	45 (26.28)
-	69 (63.9)
Total	200 (100.0)

Table 4: The prevalence of clinical and sub-clinical mastitis based on CMT in examined farms at cow level

Total number of animal examined	Prevalence (%)	
	Clinical	Sub-clinical
200	(21) 3.58	(179) 20.17

Clinical mastitis- based on detection of udder and milk; Sub-clinical mastitis- based on CMT; Cut off level of CMT: +++, ++, + ≡ + ve ±, - ≡ - ve

Table 5: Gram positive and Negative bacteria isolated

Isolates	Clinical No (%)	Sub-clinical No (%)	Total No (%)
Staphylococcus spp.	8 (38.1)	93(53.8)	101 (52.5)
Streptococcus spp.	4(19)	21(11.4)	25(12.3)
Enter bacterium spp.	--	4(2.2)	4(2)
Lacto bacillus spp.	--	4(2.2)	4(2)
Coryneform bacterium	4(19)	23(12.5)	27(13.2)
Micrococcus spp.	1(4.8)	9(4.9)	10(4.9)
Pseudomonas spp.	3(14.3)	8(4.3)	11(5.9)
Bacillus spp.	1(4.8)	9(4.9)	10(4.9)
Aercoccus spp.	--	7(3.8)	7(3.2)
Total	21(100.0)	178(100.0)	199(100.0)

The questionnaires survey revealed that, most of the owners poorly managed their farms because they did not know the basic of farm production management and also they are do not have consult professionals to help them on managing their farms. This resulted in a poor performance of dairy production. (Saluiemi, 2010) stated that current knowledge on the impact of the production environment on udder health is considerable. The present study also revealed a close positive relationship between isolation of bacteria from mastitic milk samples and California Mastitis Test. This means that CMT was a good diagnostic tool in the detection of sub-clinical mastitis hence it could be most reliable test to be conducted to investigate sub-clinical mastitis in the dairy farms

Conclusion and Recommendations

From the study conducted it was concluded that, the prevalence of mastitis found to be High (20.17%) for the sub-clinical mastitis while low prevalence (3.58%) for clinical mastitis in farms examined.Poor farms management affect occurrence of mastitis in the study farms. It was therefore recommended that, farm management should be seriously considered in controlling mastitis. Hygiene measurements should also be followed to reduce mastitis in dairy farms.

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