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**Keywords:** Bovine mastitis; Bacteria; Antibodies; Serum; Milk

## Introduction

Mastitis is inflammation of the mammary gland due to the injury of any type. However, the udder disease of major concern is that associated with microbial infection. The microbes that are associated with mastitis are: *Staphylococcus* species, *Streptococcus* species and other Gram positive and Gram negative rods [1]. Mastitis is characterized by physical, chemical and usually bacteriological changes in milk and by pathological changes in the glandular tissue [1]. Loss of milk production, cows premature culling, milk discarded or downgraded as well as veterinary expenses and large of some of money is lost to dairy farming each year through poor udder health [2]. Immunoglobulins in mammary secretion are derived from blood serum or are made locally by cells of the lymphocyte-plasma cell series situated close to the glandular epithelium. The major immunoglobulin in colostrum and milk of ruminants, IgG1 is derived from the blood and is transferred into secretion selectively relative to IgG2, probably by a mechanism requiring specific receptor sites on the basal or intercellular membrane of the glandular epithelium. Acute inflammation causes suppression of selective transfer of IgG1, but there is a marked increase in the transfer of proteins, such as IgG2 and serum albumin, which enter secretion non selectively. Infusion of antigen into the mammary gland of ruminants some weeks before parturition induces a persisting local production of antibody, most of which is associated with IgA and IgM. IgA antibodies in the mammary gland probably originate in the intestine, and prior antigenic stimulation of the gut may be required for maximal IgA antibody responses in the gland [3].

Substantial increases in immunoglobulin G subclass 1 (IgG1) and IgG2 antibody titers were detected in serum and lacteal secretions of animals immunized through an intestinal route. IgM and IgA antibody responses were low or undetectable. Low numbers of IgA and IgG1 plaque-forming cells were occasionally detected. It

is proposed on the basis of these data that migration of antigen-stimulated IgG lymphoblasts and perhaps of antigen, to spleen and peripheral lymph nodes may be dominant events after intestinal immunization of ruminants. This is consistent with the predominance of serum-derived IgG antibodies in colostrums and milk. Intramammary infusion of antigen gave rise to increases in antibody titers in all classes which were greater not only in lacteal secretions but also in blood serum than with their systemic route used. Comparison of IgA titers in secretions from the immunized glands with those in serum also suggest that locally synthesized IgA antibodies might have contributed in some measure to serum titers. Local synthesis in both immunized and non immunized glands was also reflected by the presence of increased numbers of IgA and IgG1 plaque-forming cells. It was hypothesized that antibody forming cells responsible for local synthesis originated in lymphoid tissue within the mammary gland or from peripheral lymph nodes, depending upon the route of immunization.

The aim of the study to isolate and identify the bacteria which can cause mastitis in cows and the antibodies forming during the infection by these bacteria and appear in milk and serum.

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**Citation:**

by acid from xylose and hydrolysis of aesculin the two were found positive in this strain but were negative in the main strain, strain 2 (2%) was differed from the main genus by acid from xylose, Salicin and

... were isolated from sub-clinical mastitis these findings were in agreement with the findings [11] who reported that *Bacillus* spp. were isolated in both clinical and subclinical cases. *K. bac.* spp. isolated and this is in agreement with Cullor [12], who found that 20% of bovine mastitic case, in Nordic countries caused by coliform of which about 85% were *E. coli* and *K. bac.* spp., and other Enterobacteria. In this study we isolated coliform bacteria like: *K. bac. ...* and *C. bac. ...* and this is in agreement with findings by Jackson and Bramle [13], mentioned that the Coliform such as *E. coli*, *K. bac. ...*, *K. bac. ...*, *K. bac. ...*, *E. coli*, *E. coli*, *E. coli* and *C. bac. ...* are all associated with bovine mastitis. Other isolated bacteria were *E. coli*, *E. coli* and *E. coli* and this is in agreement with Jayarao [14]. In this study whole cell lysate of bacterial isolates was tested against sera and milk, in order to detect specific antibodies against the isolates. Some bacterial isolates gave frank precipitation lines with their respecting serum antibodies but not with milk. In contrast, *Bac. ...* gave clear precipitation lines with sera and milk although it is not common within the bacteria that cause bovine mastitis and this is in agreement with the finding by Carneiro [15]. The significance of these antibodies in protection against mastitis [16-21] and the immunology of the udder were reviewed by Carneiro [15].

## Conclusion

This study has shown that Gram positive bacteria, especially *Staphylococcus* species were the common causative agent of bovine mastitis. The number of cows with subclinical mastitis was higher than cows than cows with clinical mastitis. The bacteria associated with mastitis can induce local and systemic specific antibodies response as measured by agar gel immune diffusion test. The research need further study to detect the other antibodies for other bacterial agents to simplify diagnosis of bovine mastitis without culturing milk to detect the specific bacteria caused mastitis and apply the method to detect the antibodies to other microorganism causing mastitis like virus and parasites.

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## Discussion

Fifty milk and serum samples were collected and bacteria were isolated from only 38 (76%) milk samples. The most common organism isolated in this study was *Staphylococcus* spp. Coagulase positive staphylococci (60%) were the most frequently isolated bacteria in this study and all of them were isolated from clinical cases these findings were in agreement with the findings other authors [3,6,7]. In this study *Staphylococcus ...* isolated and this in agreement with the finding by Chaer [8] who was isolate *Staphylococcus ...* from mastitis. *Bac. ...* isolated and this is in agreement with Logan [9]. Also an isolated bacterium was *L. ...* from mastitic cow and this is in agreement with Rawool [10]. In this study *Bac. ...* was isolated from clinical mastitis and *Bac. ...*

