CLINICAL MASTITIS AND BACTERIAL ISOLATES IN DAIRY COWS AT ASAS DAIRY FARM, IRINGA, TANZANIA.

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SUMMARY

Clinical mastitis and distribution of pathogens in dairy cows was observed in 100 cows at ASAS dairy farm, Iringa, Tanzania. It was found that 8 animals (8%) had clinical mastitis and 26 cows tested positive (26%) with indicator paper for udder control (Bovi - Vet Denmark). Out of the 26 milk samples cultured for bacteria isolation 15 samples showed bacteria growth. The most isolates were *Staphylococcus aureus* (53.3%), *Streptococcus agalactiae* (13.3%), *Escherichia coli* (13.3%), *Candida albicans* (13.3%) and *Proteus vulgaris* (6.7%). Acute mastitis was observed in cows where *Escherichia coli* was isolated, mild insidous mastitis in cases where *Staphylococcus aureus* was isolated, while in chronic cases the most isolate was *Candida albicans* . It was recommended to observe teat disinfection, hygienic, proper milking management and treatment of mastitis cases.

INTRODUCTION

Mastitis is one of the disease conditions of the mammary gland affecting milk producing animals (Jain 1979). The disease is responsible for decreased milk production, increased veterinary and treatment costs, increased labour costs, decreased sale value of infected dairy cows and increased replacement costs because of higher culling rates, (Dobbins 1977; De Graaf and Dwinger 1996).

The infection is characterised by swelling, heat, redness and pain of the udder (Blood and Radostits 1989). At the sub- clinical level symptoms of the disease may not be virtually evident and the dairyman may be unaware of the problem (Blosser, 1979). Mastitis may arise as a consequence of udder infection with one or more micro organisms, trauma or physiological disturbance (Bramley and Dodd 1984). Several pathogenic bacteria, fungi, mycoplasma and multicellular parasites are known to cause mastitis in cattle (Jasper 1985; Jonsson *et al.*, 1991; Pyorala *et al.,* 1992). Studies conducted by Mbise *et al.,* (1983), Mahlau and Hyera (1984), Njau and Kundy (1985), Mbwambo K.E (1988), Msanga *et al.,* (1989), Shekimweri, (1992) and Kambarage *et al.*, (1996) in Morogoro, Dar es Salaam, Arusha, Mwanza, Mbeya and Kilimanjaro showed that the average annual incidence of clinical mastitis is between 2.2% - 2.8% while for sub clinical matitis 40% - 71.6% and the commonest bactęria isolated were *Coliform spp, Staphylococcus spp* and *Streptococcus spp.*

ASAS dairy farm is a relative medium sized farm producing milk in Iringa town. The farm had 380 cattle including 100 milking cows in June 1997. Maximisation of profits of this dairy farm depend on the amount of milk produced which again depends on health of the udder among other factors. Mastitis as a problem in small holder units and large dairy farms had been carried out in some areas of Morogoro (Mbwambo, 1988; Shekimweri, 1992), Arusha (Mbise *et al.,* 1983; Njau and Kundy, 1985), Mwanza (Msanga *et al.,* 1989), Mbeya, (Kambarage *et al.,* 1996) and Kilimanjaro (Mahlau and Hyera 1984) in Tanzania. Therefore, this observation was a move to establish and document the existence of mastitis in dairy cows, in Iringa and to identify the microorganism isolated from suspected cases.

MATERIALS AND METHODS

Animals and management

Samples were collected from 100 cows of various breeds, stage of lactation and lactation number. These cows were milked at 3.30 a.m - 6.00 a.m and 4.00 p.m - 6.00 p.m. and all cows were milked by hands, each man had to milk 8- 10 animals. In this herd cows were milked in the same position and order. Teat disinfection before milking was by using a towel socked in lukewarm water. Each milkerman used a single towel for all 8 -10 animals but before using to the next animal the towel was washed in cold water and then in lukewarm water twice. After milking there was no teat disinfection. Cattle sheds were used in this herd and provided plenty of space per cow. The sheds and passageways were scraped every day. Clinical cases of mastitis were normally detected visually i.e mostly acute cases, where there were obvious inflammatory reaction of the udder and discolouration in milk and if any case was identified was treated promptly.

Diagnosis of Mastitis

Mastitis was diagnosed by visual observation, indicator papers and bacteriological examination of milk samples.

Visual Observation

The size of the udder and any lesions or anatomical abnormalities were recorded. The size of the rear and fore quarters, indurations and fibrosis were determined by digital palpation. The milk was examined for its odour, colour and other visible abnormalities e.g flecks.

Bovine indicator papers (BOVI-VET Denmark)

Bovine indicator paper for udder control were used to detect any acidity change of milk from each cow from each quarter. Usually when infection occurs in a quarter a change in acidity of the milk occur and this change was confirmed by means of sensitive indicator paper. The test was performed after discarding the first few drops of milk and then milking a couple of drops of milk from each quarter on its own individual spot and change of colour observed immediately within one minute and recorded. Milk from infected quarters changed the colour of the spot from yellow to green or bluish green. Milk from normal quarters did not change the colour of the spot.

Bacterial examination of samples

Twenty mililiters of milk sample from quarter which tested positive with indicator paper were collected aseptically in McCarteney bottles from each cow. The samples were kept on ice and transported quickly (18 - 24 hours) to the laboratory for bacterial isolation.

Each milk sample was cultured on 5% sheep blood agar and McConkey agar (Oxoid) and incubated at 37°C for 24 hours. Fungal growth was detected by culturing the samples on Sabouraud dextrose agar (Oxoid) at 25°C for 3 - 5 days. For obtaining pure cultures, suspected colonies on incubated plates were identified and streaked over nutrient agar (Oxoid) and incubated at 37°C for 24 hours.

Bacterial identification

Pure bacterial colonies were identified by their appearance, Gram's staining reaction and biochemical reactions. Isolates of staphylococci, streptococci and coliforms were biochemically identified according to Carter *et al.*, (1991). Culture were considered to be positive when one or more species of bacteria known to cause mastitis was isolated and negative when no bacteria growth was observed on the culture plates.

RESULTS

Clinical examinations

Out of 100 cows examined clinically, 8 cows (8%) had clinical mastitis. Two animals out of these clinical cases had an acute infection and their udders were inflamed, swollen and painful upon palpation. Chronic udder infections with fibrosis were detected in three cows. All clinically diagnosed cases of mastitis had a history of previous infection.

Indicator papers

Out of 100 cows examined 26 (26%) tested positive with the indicator paper.

Bacterial findings

Bacterialogical growth was detected in 15 out of 26 samples which had tested positive with indicator papers. Types of isolates and percentages of the total isolates are presented in Table 1.

Escherichia coli was isolated in two acute cases which had inflammed quarter and milk with abnormal colour. *Staphylococcus aureus,* were isolated in mild cases whereas cases associated with *Streptococcus agalactiae* had milk samples with a watery appearance. *Candida albicans* were isolated in chronic cases.

DISCUSSION

Mastitis is one of the costly diseases affecting the dairy industry, as it is responsible for decreased milk production, increased veterinary and tratment costs, higher labour costs and the culling of affected animals , in addition to altering the quality of milk. Twenty six percent of the examined milk sample were found to be positive using Bovine indicator paper out of these 57.8% showed bacteria growth responsible for mastitis. *Staphylococcus aureus* was the major bacteria isolated. Similar result have been reported by a number of researchers (Mbise *et al.,* 1983, Mahlau and Hyera 1984 and Miltenburg *et al.,* 1996: Lafi and Hailat,1998). Coliform spp were not a major cause of mastitis as was the cases in Mbeya region (Kambarage *et al.,* 1996).

It has been reported that several factors can influence the distribution of pathogens, including freezing. Freezing has a significant effect on the survival of *Escherichia coli* and *Actinomyces pyogenes*,(Schukken *et al.,* 1989). Schukken *et al.,* (1989) observed that with a longer period of freezing there was a significant decrease in the number of samples positive for *Escherichia coli, Actinomyces pyogenes* and no effect on *Staphylococcus aureus.* It is possible that failure to isolate more *Escherichia coli* or any *Actinomyces pyogenes* pathogens from sample tested positive with indicator paper was due to either pathogens being killed by freezing before culturing.

The contamination of milkers hands, wash cloths has been reported to increase the incidence of *Staphylococcus aureus* and that the infection is common in areas where the treatment of mastitis with penicillin has been practised intensively (Lafi and Hailat, 1998).

The use of lukewarm water and single towel for 8 - 10 cows could be a reason for high rate of isolation of *Staphylococcus aureus*. The use of individual towels for each cow is a well established factor as an important control measure for mastitis (Torgerson *et al.,* 1992). Premilking and postmilking teat disinfection is highly effective in the control of *Staphylococcus aureus* and *Streptococcus agalactiae* infections (Neave *et al.,* 1966; Galton *et al.,* 1986).

Galton *et al.,* 1986, demonstrated that premilking dipping with iodophor, hypochlorite or dedecylbenzenesuphonic acid preparations the total bacterial counts in milk, particularly when the teats were throughly wiped afterwards. Premilking or postmilking teat preparation were not practised in the farm, hence a factor in high number of pathogens.

Table 1: Bacterial species isolated from milk sample from milking herd ASAS dairy farm Iringa, Tanzania.

No	Bacterial species	Number of isolates	% of total isolates N = 15
1	*Staphylococcus aureus*	8	53.3
2	*Streptococcus agalactiae*	2	13.3
3	*Escherichia coli*	2	13.3
4	*Candida albicans*	2	13.3
5	*Proteus vulgaris*	1	6.7
	Total	15	

CONCLUSION

The results reported here show that mastitis is a problem in Iringa and many other dairy herds in Tanzania. The use of hot water to rinse the towels, individual towels for each cow, premilking and postmilking teat disinfection or proper treatment of mastitic cases should be encouraged to the farmer as a means of controling mastitis.

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