

Short Communication

**A Short drug trial of Mastitis in Cattle**

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**Abstract**

Mastitis is characterized as an inflammation of glandular tissue of the udder with physical, chemical and microbiological changes in the milk. An antibiotic susceptibility trial was conducted, of farmox (amoxycillin), floxatryl (norfloxacin), tyloject (tylosin), tribriksen (sulphadiazine-trimethoprim) and rasomycine (oxytetracycline) under field conditions in cattle naturally infected with mastitis. The isolated bacterial pathogens isolated from milk samples of affected cattle were susceptible in the ascending order to oxytetracycline, sulphadiazin-trimethoprim, norfloxacin amoxycillin and tylosin. The comparative drug efficacy against mastitis was 90% tyloject, 85% farmox, 35% rasomycin, 55% floxatryl and 75% tribriksen. The total economic loss due to mastitis at a village level was assessed as 8405 (\$) rupees per annum per farmer.

**Key words:** Mastitis, cattle, medicine, efficacy

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**Introduction**

Productive capacity of dairy animals is affected adversely by poor nutrition, lack of management and various diseases. One of the most important obstacles defying the economics of milk production in third world countries is mastitis. It is the most inflated disease of the dairy industry throughout the world [1]. Mastitis is characterized as an inflammation of glandular tissue of the udder with physical, chemical and microbiological changes in the milk [2]. It can also transmit major zoonotic diseases like brucellosis, tuberculosis, leptospirosis, gastroenteritis and streptococcal sore throat [3]. The clinical mastitis could be per acute, acute, sub-acute and chronic. Subclinical mastitis is a major problem in dairy animals of Punjab so; there should be keen observation in various farming systems due to its potential effect on milk production and food security. It causes about two third losses of the total milk production in affected quarters of animal. Cattle have been reported to be more susceptible to mastitis than buffaloes [4,5].

Microorganisms that can cause mastitis vary from community to community. The microorganisms most commonly involved udder diseases are staphylococci (*S. aureus* and *Staph. epidermidis*), coliforms (mostly *E. coli* and *Klebsiellapneumoniae*) and streptococci (*Str. agalactiae*, *Str. dysgalactiae*, *Str. Uberisand Str. bovis*) [6]. *Staphylococcus aureus* and *Streptococcus agalactiae* are the principal microorganisms in all the pathogens of bovine mastitis [7].

In lactating cows most of the cases of mastitis occur in lactating cows, often soon after calving, with the abnormal milk [8]. Early diagnosis of mastitis with reliable tests facilitates successful treatment and control. It is needed to detect and treat the udder infection at the sub clinical phase has long been known as a significant approach for the accomplishment of mastitis control program [9]. Antibiotic susceptibility testing can be performed which help the clinicians to assess the potential drug for the appropriate antibiotic treatment [10]. Therefore, the present study was conducted to check the antibiotic susceptibility of different antibiotics against mastitis pathogens in cattle, to evaluate drug efficiency by using five broad spectrum antibiotics against the cases of mastitis and evaluation of overall cost/benefit ratio.

**Materials and Methods**

The mastitis test was performed in lactating animals of four different herds as described by Seguya AG, Mansell [11]. The positive milk samples were processed for bacterial isolation and identification according to procedures described by National Mastitis Council Inc., USA. Briefly, the samples were shaken to get a uniform suspension of the bacterial pathogens. 0.01 ml of milk sample was taken by platinum loop, streaked onto Esculin-blood agar and MacConkey's agar plates and incubated at 37°C for 48 hours. The typical colonies of the microorganisms were isolated and purified by streaking onto fresh

Esculin-blood agar plates. Slides of fresh purified culture were prepared and Gram's staining was performed.

**Table 1: Medicine composition, dose and route of administration**

Medicine /composition (Inj.)	Dose Rate(mg/kg)	Route of Administration	Manufacturer
Tribressen 48%	48mg/kg body weight	I/M	Glaxo-Wellcome
Farmox 15%	10 mg/kg body weight	I/M	Prix-Pharmaceuticals
Floxatryl 5%	10 mg/kg body weight	I/M	Prix-Pharmaceuticals
Tyloject 5%	10 mg/kg body weight	I/M	Vety-Care

Catalase and coagulase test positive, Gram positive organisms were identified as Staphylococci or Micrococci. Organisms other than Staphylococci were identified as per criteria recommended by National Mastitis Council, Inc. USA [12].

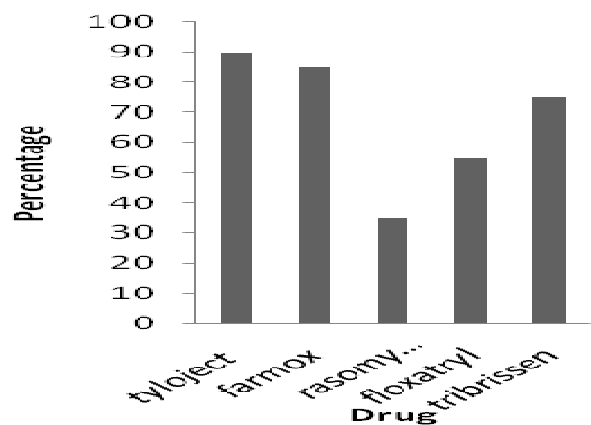
The antibiotic susceptibility test was performed to observe the susceptibility of pathogens to the antibiotics according to Arshad et al [9]. Briefly, the zone of the inhibition was measured after 18 hours of incubation. The largest clear zone is considered + + + + (four plus); While, others 3 or 2 are also considered positive. The zone with bacterial colonies demonstrated antibiotic resistance. The selected animals from the herds were treated with the selected medicine. Each drug was used for randomly selected 20 animals according to the dose rate and route of administration as mentioned in the Table 1.

Economic losses because of mastitis were calculated by comparing milk production of cattle for the previous lactation. The assessment of economic losses was done with cost of treatment charges the value of milk production. The data was analyzed by quantitative statistical software SPSS.

### Results and Discussion

*Staphylococcus aureus* was the most frequently recovered bacterial species of all the isolates. It shows that *Staphylococcus aureus* is the leading cause of mastitis in dairy cattle. Our results are in accordance with Ali et al [1]. Our results were also similar with the results of study conducted by Arshad et al [9]. In their study they also find *Staphylococcus aureus* more prevalent. The antibiotic susceptibility of different drugs was calculated. The percentage of organisms sensitive to the drugs is given in Figure 1.

Arshad et al [9] also find almost same percentages of antibiotic susceptibility against mastitis causing pathogens in buffalo milk. The comparative drug efficacy of five different broad spectrum antibiotics farmox (amoxicilline), floxatryl (norfloxacin), rasomycin (oxytetracycline), tyloject (tylosin) and (sulphadiazine-trimethoprim) were detected against the clinical mastitic animals in the field condition. The efficacy was determined after 3 and 5 days post-treatment. On the basis the clinical trial tylosin and farmox were found the best choice for the chemotherapy of mastitis, while effect of oxytetracycline minimum. In our study the efficacy of farmox (amoxicilline), floxatryl (norfloxacin), rasomysin (oxytetracycline), tribriessen (sulphadiazine-trimethoprim) and tyloject (tylocine) in cattle was 85%, 55%, 35%,75% and 90% respectively.



**Figure 1: Efficacy and susceptibility of drugs used in this study**

The highest efficacy rate was 90% for tyloject (tylosin), which was similar with the results of Zeconi et al who reported 96% efficacy of tylosin against clinical mastitis in buffaloes and cattle [13]. Our results were also in accordance with Boloruchi et al, who found that tylosin was drug of choice to the control of mastitis [14]. Our findings are also similar with the study of Dudrikova et al who reported that liquid chromatographic analysis of milk samples from 6 cows treated with tylosin in a veterinary practice indicated that tylosin persisted in milk for more than 3 days after the final treatment [15].

The second drug of choice was farmox (amoxicillin) which showed 85% efficacy against mastitis in cattle. Intra-mammary amoxicillin was the most efficacious treatment for environmental streptococci in mastitis according to the studies of Roberson et al [16]. Results of our study were also matching with findings of Wilson et al, who reported that antibiotic treatments that significantly differed from the untreated cure rate of 65% were amoxicillin (82%). These findings are in agreement with previous studies who reported 89% efficacy of amoxicillin against mastitis [17, 18].

**Table 2: Medicine ingredients and composition**

Medicine (Inj.)	Ingredients	composition
Tribressen	Trimethoprim+Sulphadiazine	8%+40%
48%		
farmox	Amoxicillin	150mg
15%		
Floxatryl	Norfloxacin	50 mg
5%		
Tyloject	Tylosin	50%
5%		

In conclusion, mastitis is an important obstacle defying the economics of milk production in Pakistan. Proper screening of animals should be done in animal herds after a period of few months. Antibiotic therapy should be done in clinical and sub-clinical cases in cattle. According to our findings tylosin is the drug of best choice. In addition, precautionary measures such as proper washing of milker's hand and use of dry and clean utensils can minimize the chances of spread of this disease.

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