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## Ethno veterinary practices is an alternate system of medicine for treatment of bovine mastitis in small dairy holding farmers

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### Abstract

Bovine mastitis is a prevalent disease in India's dairy cattle, significantly impacting animal health, milk quality, and production, leading to estimated economic losses of approximately Rs 70 billion annually. The indiscriminate use of antibiotics for treatment not only escalates costs but also contributes to antimicrobial resistance (AMR). This study explores the efficacy of ethno-veterinary herbal formulations as a cost-effective alternative to conventional treatments. Conducted across Guntur, Karimnagar, and Mysuru, 279 cases were treated with herbal mixtures containing Aloe Vera, turmeric, and calcium hydroxide. Results indicated an 89% recovery rate, highlighting the potential of ethno-veterinary practices in managing mastitis while reducing antibiotic use. Further research is recommended to enhance adoption and assess effectiveness in diverse settings..

**Keywords:** Bovine mastitis, ethno-veterinary medicine, antimicrobial resistance, herbal formulations, dairy cattle

### Introduction

The bovine mastitis in dairy animals is common diseases in cattle in India. Mastitis adversely affects animal health, quality of milk and lose in milk production and affecting every country, including developed ones and causes huge financial losses (Sharma N *et al.*, 2017) <sup>[1]</sup>. As reported by WHO (2023) the acquired antimicrobial resistance (AMR) in bacteria has been a growing concern worldwide. It is estimated annual economic loss only from bovine mastitis in India was reported to be around Rs 70 billion (Bansal and Gupta, 2009) <sup>[2]</sup>. BAIF livelihoods institute is working in 15 states and providing the livestock services such as breeding, fodder development, animal health, capacity building, and cutting age technologies. During the course of interventions of livestock programmes in the country, it was noticed that, the cost of treatment of mastitis is ranges from Rs 500-2500/-per dairy animal. Besides the higher cost of treatment, the second major concern is indiscriminate use of antibiotics is not only expensive but also leads to its residues in milk and also contributes to the emergence of antimicrobial resistance (AMR) even among the humans. The world is presently gearing up to combat the global threat of antimicrobial resistance (AMR) and, the recent report of the Inter-Agency Coordination Group (IACG) on AMR focuses on creating awareness, monitoring and restrictions on the use of antimicrobials, but is silent on alternatives to antimicrobials (WHO, 2019) <sup>[3]</sup>. Many researchers have reported that, the use of Ethno-veterinary herbal formulations are important to combat mastitis in livestock and reduces the use of antibiotics. Ethno-veterinary practice (EVP) can be used as preventive medicine and cure in the early stage of infection. It has decentralized local resource based applications which are both safe, efficacious and have much fewer adverse effects in the animals. It is difficult to carry livestock to town or district hospital and veterinary services may be scant in the villages and time taking. Therefore, ethno veterinary practices may be the one of best alternate system of medicine, cheapest source and commonly available at farmer's doorstep, so that in time treatment of animals can help to reduce the treatment delay, disease progression economic losses to dairy farmers.

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Hence, an alternate approach was attempted to study the efficacy of ethno-veterinary medicine (EVM) formulation for control of bovine mastitis in cattle which is generally practiced by the local healer in the community. The purpose of this research paper is to compare the EVM efficacy with the standard practices.

### Material and Methods

The study was conducted on dairy animals in the district of Guntur, Karimnagar and Mysuru of Andhra Pradesh, Telangana and Karnataka respectively. The 10 years old Cattle Breeding Centres were identified where the technical person working as Artificial Inseminator (AI) and providing the doorstep services to dairy animals. Since all herbal medicines are available easily at home or in the village so it become very convenient to farmers for adoption of herbal medicine for treatment of Mastitis.

The Artificial Inseminator, field supervisors and farmers were trained by a Veterinary Doctor on mastitis symptoms, method of herbal preparation with therapeutic application and its control measures. These are made using the ingredients like Aloe Vera, Turmeric and Calcium hydroxide taken in given quantity (Table-1) and ground in the machine to make a fine paste and applied to udder for 5 times in a day for 4 days.

Along with its external application half cut 2 lemon were also fed to the cattle twice daily and continue for three days. Similarly, every day a fresh medicine is prepared using the fresh herbal plants collected from the field. During the period of twelve months a total of 279 cases were treated in the study area.

The above medicines were used by the trained AI worker and treated the clinical mastitis using herbal medicine in their respective working areas. Further, the filed survey was carried out to evaluate the efficacy of Ethno veterinary herbal medicine for control of mastitis in the small holding dairy farmers in the.

After the completion of study, a adaptation of EVM practice survey was conducted in prescribed format from randomly selected 54 farmers in all 3 districts who have used EVM. Based on the improvement in clinical signs such as reduction in udder inflammation, normalcy in milk consistency, colour, free from blood, milk yield to normal levels, the animals were considered as recovered from clinical mastitis. The normalcy of clinical symptoms was observed from 3-10 days.

The herbal combinations and method of use for control of mastitis were practiced by various healers was published by BAIF (2018) in Kannada and English "by National Dairy Development Board (NDDB).

**Table 1:** Show these are made using the ingredients like Aloe Vera, Turmeric and Calcium hydroxide taken in given quantity

Disease condition	Ingredient used	Preparation Procedure	Application procedure
Bovine Mastitis	Aloe Vera -500gm Turmeric powder-50gm Calcium hydroxide (lime)-15g	Mix Aloe Vera Pulp, turmeric powder and lime were mixed to form a red colour paste. 60-75g of this paste was taken into a bowl and add 150 ml of water to make it liquid 2. Besides its external application, 2 lemon were also fed to the affected cattle twice daily and continued for three days.	Wash the udder of Cattle and milk stripped out completely. The mixture was applied thoroughly with firm pressure of palm. The application is repeated 5 times a day for 4 days.

### Results and Discussion

The study shows that 89% animals including HF Cross, Jr Cross, Graded Murrha and Gir were clinically recovered from mastitis after the application of above said formulation. The breed wise recovery recorded was 90%, 96%, 81% and 100% in HF cross, Jr cross, graded Murrha and Gir respectively with variable sample size (Table-2). Management of common ailments of dairy animals with ethno-veterinary herbal preparations in Gujarat recorded the recovery 92.6% and 89% in cattle and buffalo (P Dutta *et al.*, 2020) <sup>[4]</sup>. Cost of application of EVM preparation for 8-10 days is variable farmers to farmers depending upon availability of plants and duration of application.

The cost of Ethno veterinary medicine for treatment of Mastitis is Rs. 500 to 400 as compared the allopathic medication cost of around Rs. 500 to 4000 (Dutta., *et al.*, 2020) <sup>[4]</sup> i.e. 88% saving!

A detailed lactation wise analysis of EVP treatment carried out for clinical mastitis shown in Table 3. Recovery rate is increasing as lactation increases. The cure rate was higher in Lactation-2 and lactation-4, 93% and 94% respectively, whereas in lactation-1 and Lactation-3 the cure rate is low 82% and 89% respectively.

The adoption of Ethno Veterinary practice by the farmers was recorded over 3 months post training period, through direct interview with the farmers. It shows that a quarter (28%) of the farmers adopted the EVP and 72% families discontinued. The reasons for non-adoption of Ethno veterinary Practice by the dairy farmers were because of Application of medicine for 5 time in day is a laborious and time consuming (26% of farmers), The duration of application is more (49%), Not enough time to follow the therapy (21%) and no result (5%), The similar kind of constraints for adoption of Ethno veterinary Practices for Dairy Cattle Disease Management were also recorded by Christy *et al.* (2018) <sup>[5]</sup>.

**Table 2:** The table shows breed wise recovery of animals by Treating Ethno Veterinary Practice (EVP).

Breed	Total Number of animals Treated	Total Recovered animals	Recovery %
HF Cross	148	134	90
Jr Cross	53	51	96
Graded Murrha	75	61	81
Gir	3	3	100
	279	249	89

**Table 3:** Lactation wise result

Lactation No.	Total Number of animals Treated	Total Recovered animals	Recovery %
Lactation 1	65	53	82
Lactation 2	122	113	93
Lactation 3	76	68	89
Lactation 4 and above	16	15	94
	279	249	89

**Table 4:** Adaptation of Ethno Veterinary Medicine by small dairy farming farmers

Total Families surveyed	No. of family discontinued	No. of families adopted	% discontinued	% adopted
54	39	15	72	28

**Table 5:** Reason for non-adaptation of Ethno Veterinary Medicine (N=39)

Constrain for adaptation	Families discontinued	%
Application of medicine for 5 time in day is a laborious and time consuming	10	26
The duration of application is more	19	49
Not enough time to follow the method of application/Therapy	8	21
No result	2	5



### Conclusion

The results of Ethno veterinary practice (EVP) were shows very encouraging in control of clinical bovine mastitis in cattle and buffalo. EVP has a great potential as a cost effective and efficacious in Bovine mastitis and it has an advantage to the small holding dairy farmers. Additionally, this also helps to minimise the use of antibiotics, thereby the residues in milk and milk product can also be reduced. In view of adaptation of Ethno Veterinary Practices has many constrains in application like laborious and time consuming etc. Therefore, is need to make and readymade herbal products to livestock owners at low cost for cure of mastitis in rural areas.

Since this work is carried out with limited scope to carry the study in control condition at field level in the villages and availability of affected animals during the study period, a follow up or another location study at controlled condition with proper experimental design is advised for precisely measuring the effect of herbal plants for the control of mastitis in dairy animals.

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