International Journal of Veterinary Sciences and Animal Husbandry 2023; 8(6): 146-148

ISSN: 2456-2912
VET 2023; 8(6): 146-148

www.veterinarypaper.com
Received: 03-09-2023
Accepted: 07-10-2023

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Evaluating the efficacy of ethno veterinary medicine (ENTEROHERB*) in cattle diarrhoea

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Abstract
Ethnoveterinary medicine is the most common alternative medicine that includes the belief and traditional practices about the health of animals using various herbs. The present study was carried out to evaluate the remedial efficacy of an ethnoveterinary compound, the ENTEROHERB against neonatal calf diarrhea and non-specific diarrhea of adult cattle. A total of 15 calves and 20 adult cattle that were showing signs of diarrhea were selected for the present investigation. Watery diarrhea in all the calves with mucous and blood in 6 and 1 calf along with reduced appetite, dry skin and coat, and dehydration were recorded signs in calves. All these calves were negative for any parasitic ova but found positive for *E. coli* on fecal culture in 09 calves. Whereas, all the 20 adult cattle were showing similar signs *viz*., semisolid to watery dung for a couple of weeks with slightly reduced appetite, milk yield, and rumen motility. All these cattle were also negative for any endoparasitic ova and bacteria. Following treatment with ENTEROHERB @ 5-10 g in calves and 15 g in adult cattle orally for 3-5 days showed a marked improvement in the clinical signs along with improvement in fecal consistency, appetite, and hydration status.

Keywords: Neonatal calf diarrhea, non-specific diarrhea in cattle, EVM, ENTEROHERB

Introduction
The use of various herbs and their parts as medicinal components is one of the options for livestock farmers who are interested in alternative medicinal practice. Some of the livestock farmers are into this practice keeping the associated side effects of using allopathic drugs. The traditional practices involved in the health and care of livestock is now considered as ethnoveterinary practice or medicine. Research into ethnoveterinary medicine is often undertaken as part of a community-based approach that serves to improve animal health and provide basic veterinary services in rural areas. Ethno-veterinary practice is based on folk beliefs, traditional knowledge, skills, methods and practices to cure diseases and maintain the health of animals (Tabuti *et al*., 2003) [12]. At the same time, ethno-veterinary practices are also equally economical and is being used for animal health and production (Kudi, 2003) [6]. The present study was undertaken to evaluate the remedial efficacy of a plant-based ethnoveterinary product, *ENTEROHERB* against diarrhoea in cattle for its safety and efficacy in a non-experimental method.

Materials and Methods
The study was conducted for documentation of the remedial efficacy of *ENTEROHERB*, an ethnoveterinary product from M/s Yourfarm, Animeta Agritech PVT Ltd., Coimbatore, Tamil Nadu. Cattle and neonatal calves that were showing signs of semi-solid to watery dung with or without other associated manifestations were considered for the evaluation protocol. Fecal samples from diarrhoeic calves were collected for microscopic evaluation followed by culture to detect the presence of enterobacteria and the dung from the diarrhoeic cattle was also collected for microscopic evaluation to rule out the presence of any endoparasitic load. Based on the results, calves with neonatal diarrhea and cattle with non-specific diarrhea were confirmed. All these affected animals were treated with ENTEROHERB @ 5-10g (calves) and 15g (adult cattle), orally twice a day for 3-5 days. However, the required supportive medication and other supplements were also included on an SOS basis.

Results and Discussion

A total of 15 neonatal calves and 20 adult cattle that were presented with loose watery diarrhea were included in the present investigation. Out of 15 neonatal calves, all the calves were showing watery diarrhea, with mucous (6) and blood (1). Calves were dull on presentation with reduced appetite, dry skin and coat and dehydration. Temperature, pulse, and respiration were within the normal range. All these calves were negative for any parasitic ova. However, fecal culture revealed *E. coli* in 09 calves. Neutrophilic leukocytosis was the significant abnormality in CBP. Whereas, all the 20 adult cattle were showing similar signs *viz*., semisolid to watery dung for a couple of weeks with slightly reduced appetite and rumen motility. All these cattle were also negative for any endoparasitic ova and bacteria. A slight drop in milk yield was also reported in 7 cattle. Diarrhea and other digestive diseases are some of the common causes of calf mortality that may account for about 5% of total mortality from birth to weaning (UDSA 2002) [13]. The most commonly recognized causes of neonatal calf diarrhea are *Rotavirus, Coronavirus*, enterotoxigenic *Escherichia coli*, and Cryptosporidia, which is associated with malabsorption (Snodgrass *et al*., 1986) [11].

Ethnoveterinary medicine is a branch of alternative medicine that involves conventional/traditional beliefs and their practice for a considerable period coupled with scientific research for the benefit of animal health. In the present time, ethnoveterinary medicine plays an important role in rural areas as a chief source of medicine to cure livestock (Khan *et al*., 2019) [5]. All the conventional healing practices were derived from various herbs and play an essential role in treating and preventing a variety of diseases by local inhabitants (Rates 2001) [10]. Documented reports estimated that approximately 50% of today's modern drugs have been derived from plants and their various components (Ahmed *et al*., 2021) [1].

Following treatment with ENTEROHERB for 3 days, improvement in general condition with change in fecal consistency was noticed from day 2 in a majority of calves (12) and cattle (15). However, following treatment for 2 more days showed complete clinical recovery with normal consistency and frequency of dung, appetite, and general health. Rumination and milk yield also reached normal. The ENTEROHERB is an ethnoveterinary product that contains *Cassia* sps and *Curcumin* sps as the two chief herbal ingredients. The *Cassia* sps like *C. occidentalis* and *C. tora* is one of the medicinal herbs that have antimicrobial, anti-inflammatory, antioxidant, and hepatoprotective effects that are associated with certain phytochemicals such as anthraquinones, alkaloids, and flavonoids. Another species of *Cassia*, the *Cassia fistula* (Linn) is widely known for its medicinal properties. The *in vitro* studies on methanol extract of *Cassia fistula* revealed a significant efficacy against diarrhea and microorganisms. The use of extracts of *Cassia fistula* (Linn) leaves significantly (p<0.001) decreased the frequency of defecation and wet stools when used in diarrhea. The extract also showed significant growth inhibition on the selected bacteria in a concentration-dependent manner. The documented reports also reveal that the effects elicited by the extract are comparable to those of loperamide and chloramphenicol, the respective standard antidiarrheal and antibacterial drugs. Isaac *et al*., (2022) [4] documented the use of *Cassia fistula* (Linn) leaves as an effective antidiarrheal and antibacterial agent. The rich phytochemical composition and wide range of pharmacological activities make *Cassia* species a valuable resource in the field of natural medicine. Several authors documented the efficacy of other herbal agents against diarrhea and enteric bacteria. Aegle marmelos, commonly known as bilwa or bael, was used for indigestion and also possesses antidiarrheal, antimicrobial, and antiviral properties (Rahman *et al*., 2014) [9]. Various bioactive compounds present in this plant have been reported to be effective against several bacterial strains and showed significant inhibitory action against castor oil-induced diarrhea (Rahman *et al*., 2014; Heitzman *et al*., 2005) [9, 3]. Punica granatum is also said to be an astringent and antioxidant that is effective in diarrhea and dysentery (Muhammad *et al*., 2005) [8]. The seeds of Kodtumba are found to an effective antidiarrheal activity due to their inhibition of the increased watery secretions that occur in diarrhea (Lans *et al*., 2000) [7]. *Curcuma longa* and its major bioactive constituent (Curcumin) possess various pharmacological properties. *Curcuma* sps leaves were also scientifically evaluated for their antidiarrhoeal and antioxidant properties and reported their efficacy in castor oil and MgSO4-induced diarrhoeal models and charcoal-induced gastrointestinal motility test in Swiss Albino mice. The authors opined that the extract displayed remarkable antidiarrhoeal activity, evidenced by a reduction in the rate of defecation as well as by retardation of intestinal transit of charcoal meal in test animals throughout the study period (Akter *et al*., 2010) [2].

Conclusion

From the present investigation, it may be concluded that the *Cassia* and *Curcumin* sps present in the ethnoveterinary compound, ENTEROHERB are effective in treating and alleviating the signs associated with the neonatal diarrhea of calves and non-specific diarrhea in adult cattle when treated for 3-5 days.

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