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Satish Kumar K

Professor and University Head,
Department of Veterinary
Medicine, C.V.Sc.,
Rajendranagar, Telangana, India

Tirupati K

Post-Graduate Student,
Department of Veterinary
Medicine, C.V.Sc.,
Rajendranagar, Telangana, India

Srikanth K

Veterinary Assistant Surgeon,
District Veterinary Hospital,
Karimnagar, Telangana, India

Corresponding Author:

Satish Kumar K

Professor and University Head,
Department of Veterinary
Medicine, C.V.Sc.,
Rajendranagar, Telangana, India

Efficacy of *Rumifi-H* in ruminal dysfunctions of cattle

Satish Kumar K, Tirupati K and Srikanth K

Abstract

Proper digestion and assimilation of feed impacts the productivity of animals and thus the economy of livestock farmers. Anorexia caused by indigestion, and tympany are the most common dysfunctions of rumen among cattle that are commonly associated with abnormal quality and quantity of feed and its ingredients. In the present study, 30 cattle presented with anorexia, suspended rumination, tympany, drop in milk yield, and generalized weakness were subjected to thorough physical examination and rumen liquor analysis. Subsequently, they were diagnosed with rumen acidosis (16), bloat (8), and simple indigestion (6). The rumen liquor was milky white in colour, viscous consistency, and had an acidic odour, with a pH ranging from 5.5-6.8. Rumen microbes were very much less with sluggish motility to complete dead protozoa. Following treatment with an ethnoveterinary medicine (EVM), *Rumifi-H* @ 30 g as electuary with jaggery, improvement in clinical signs was noticed from day 3 in 80% of the affected cattle and whereas 100% recovery was noticed by day 5. The herbal constituents present in the *Rumifi-H* act as stomachic and rumenotonic that induce reticulon-rumen contractions and gastrointestinal motility. These ingredients also have antioxidant properties which also act as buffering agents thus improving digestion. Hence, the EVM *Rumifi-H* can be used as an herbal mixture against rumen acidosis, bloat and simple indigestion in cattle.

Keywords: Rumen dysfunctions in cattle, acidosis, bloat, simple indigestion, *Rumifi-H*

Introduction

Generally, livestock is considered as complementary to the agriculture sector as it is most commonly practiced in the rural parts of the country. Thus, the livestock is the backbone of the rural farmers next to agriculture. At present, the state governments and the government of India is also encouraging and promoting livestock rearing on par with agriculture through various schemes as an alternative for income sources thereby reducing farmer suicide due to crop failure. Of all the diseases affecting livestock, rumen dysfunctions are the most common which are actually precipitated due to modern feeding systems. Farmers are forced to feed high grain and energy feed anticipating high yield and productivity. An intensive feeding system with a high grain ration is leading to the production of more volatile fatty acids and thus lactic acid, predisposing rumen acidosis and other rumen dysfunctions (Askar *et al.*, 2011 and Smith R. 1998) ^[1, 17]. Allopathic medicine is the first priority of treating any disease of animals as it gives immediate results but is the most common reason for adverse drug resistance. It is also one of the important causes of adverse drug effects resulting in anaphylactic reactions. In the present scenario, ethnoveterinary medicine is one of the emerging alternative medicines that includes herbal mixtures or drugs used to treat various diseases of livestock including rumen dysfunctions. These herbal medications are economical, easily available, and also less toxic to non-toxic (Mishra *et al.*, 2015) ^[12]. The present paper puts on record the efficacy of an ethnoveterinary herbal mixture *Rumifi-H* (*Your Farm, Coimbatore, Tamil Nadu) against certain rumen dysfunctions in cattle.

Materials and methods

The present investigation on the efficacy of *Rumifi-H* against rumen dysfunctions was carried out in clinically occurring cases of farmer-owned crossbred cattle in certain districts of Telangana State. A total of 30 crossbred cattle that were showing the clinical signs suggestive of rumen dysfunctions *viz.*, reduced appetite to complete anorexia, suspended rumination, distended abdomen, generalized weakness reduced milk yield, etc., were selected for the study.

After a thorough clinical examination rumen liquor was collected through amniocentesis and subjected to its evaluation. All the animals diagnosed with various rumen dysfunctions were treated with an Ethnoveterinary medicine *Rumifi-H* @30g mixed with jaggery as an electuary daily for 3-5 days (depending on the severity). *Rumen liquor* was collected on day 0 (before therapy), 3 (during therapy), and 5 (after therapy) to evaluate physical, chemical, and microscopic aspects. Efficacy was assessed based on clinical improvement, improvement in rumen liquor parameters, and milk yield.

Results and discussion

Almost all the thirty cattle included in the present study were showing similar manifestations viz., reduced appetite (07), anorexia (13), suspended rumination (12) rumen atony (18), distended left flank (09), bilateral distension of abdomen (08), rumen impaction (07), reduced milk yield (22), generalised weakness (27) and respiratory distress (13). Rumen liquor analysis revealed pale brownish to milky white (07), viscous (08), highly viscous (14), acidic odour (14), slightly acidic pH of 6.5-6.9 (21), acidic pH of 5.5-6.5 (09), reduced protozoal motility (19) and completely dead rumen protozoa (11). Based on these clinical signs and rumen liquor analysis thirty rumen dysfunction cattle were classified as rumen acidosis (16), bloat (08), and simple indigestion (06), respectively. Rumen is an anaerobic chamber that not only stores feed, it also ferments, grinds, mixes, and thereby maintains optimum pH for proper microbial digestion. The rate and strength of reticulo-rumen contractions are important in the propulsion of well-masticated and fermented feed for further digestion and absorption (Yellappa *et al.*, 2021) [19]. Various disorders associated with rumen dysfunction are the primary cause of reduced production in cattle. These conditions may sometimes have a high morbidity and mortality resulting in huge

economic loss (Kimberling, 1998) [8]. Indigestion is the most common primary term used to describe any rumen dysfunction. The common reticulo-rumen dysfunctions include ruminal acidosis, bloat, and simple indigestion that are characterized by reduced appetite or complete loss of appetite, suspended rumen motility, alterations of rumen pH along with alterations in rumen microflora (Radostits *et al.*, 2010) [14]. Similar to our present findings, ruminal acidosis comprised the highest percentage of all the other rumen dysfunctions like frothy and gaseous bloat and simple indigestion (Kinde and Edom, 2021) [9]. Such dysfunctions may be due to either over-feeding or sudden changes in the quality or quantity of diet, consumption of indigestible roughages, etc. The authors are of the opinion that the highest prevalence of acid indigestion in the present study might be due to improper feeding practices in the area where the study was carried out. In acute ruminal acidosis, the ruminal pH will be less than 5.5 and the affected animals have depression, loss of appetite, reduced rumination, diarrhoea, and dehydration with consequent fluid loss, increase in hematocrit, and decreasing the elasticity of the skin (Hernandez 2014; Laskoski *et al.* 2014) [6, 10].

All the rumen dysfunction in cattle was treated with Ethnoveterinary medicine *Rumifi-H* @ 30g mixed with jaggery as an electuary daily for 3-5 days. Following treatment 24/30 animals showed marked improvement in clinical signs with respect to the distended rumen, appetite, rumen motility, milk yield, and overall general health by day 3 and whereas 6/30 cattle that were showing severe rumen acidosis (pH 5.5), rumen atony and severe dehydration did not recover fully but were showing slight improvement with respect to clinical parameters and rumen liquor. However, all these cases also recovered fully and returned to normal by day 5 (Tables 1 and 2).

Table 1: Clinical signs associated with rumen dysfunctions in cattle (N=30)

Sl. No	Parameter	Day 0 (N=30)	Day 3 (N=24)	Day 5 (N=30)
1	Appetite	Sluggish-completely absent	Normal	Normal
2	Rumen	Bloated	Normal	Normal
3	Rumen consistency	Impacted	Resilient	Resilient
4	Rumen motility	0-1/2min	3-5/2min	3-5/2min
5	General Appearance	Dull and depressed	Active	Active
6	Hydration	Dehydrated	Normal	Normal
7	Muzzle	Dry	Moist	Moist
8	Milk yield	Reduced	Reached normal	Reached normal

Table 2: Rumen liquor findings of cattle with Rumen acidosis (N=16)

Sl. No	Parameter	Day 0 (N=16)	Day 3 (N=10)	Day 5 (N=16)
1	Colour	Milky white	Greenish	Greenish
2	Consistency	More viscous	Less viscous	Less viscous
3	pH	5.5-6.7	6.9-7.2	6.9-7.2
4	Odour	Acidic	Dung	Dung
5	Rumen microbe motility	Zero-sluggish	Vigorous	Vigorous

Motility inducers, alkalizing agents, and antifoaming agents along with those that restore the rumino-reticular environment are commonly used in treating rumen dysfunction in cattle. When used irrationally, there is a risk of adverse reactions particularly fluid and electrolyte imbalance and further disturbance of the rumen environment (Boothe and Jenkins, 1995) [2]. To avoid these side effects and adverse reactions a variety of herbal mixtures or drugs are available commercially for the management of rumen dysfunctions of cattle (Jayakrishnan and Alex, 2002) [7].

The *Rumifi-H*, an EVM used in the present study contains *Cissus* sp., *Zingiber* sp. and *Trachyspermum* sp. in botanical base as the major ingredients. These individual constituent herbs are scientifically well known to possess appetizer, restorative, carminative, stomachic, and tonic activity (Rajiv *et al.*, 2011) [15]. *Cissus* is also termed *Vitis quadrangularis*, *Lycopodium imbricatum* or *Heliotropium indicum*. In Ayurveda, it is used as Pachan dravya (digestive aid), Sara (relieves constipation), Athiyuk (strengthening bones) and Vrushya (aphrodisiac). *Cissus quadrangularis*, also known as

veldt grape, adamant creeper, or devil's backbone, is a plant that belongs to the grape family. The healing properties of this plant are attributed to its high contents of vitamin C and antioxidant compounds like carotenoids, tannins, and phenols. The young shoots of this herb are dried, powdered, and burnt to ashes. These ashes are used in many digestive dysfunctions like dyspepsia, indigestion, and motility disorders. The leaves are considered alternatives for the treatment of certain gastrointestinal disorders (Sundaran *et al.*, 2020; Chauhan, 2019) [18, 4]. The rhizome *Zingiber officinale*, commonly known as ginger has been used as a phytomedicine against many digestive disorders and most commonly as a stomachic (Borrelli *et al.*, 2004; Mamaghani *et al.*, 2013; Nemati *et al.*, 2021) [3, 11, 13]. It is also popularly known for its laxative, prokinetic, antidiarrheal, antispasmodic, and anti-colic properties (Ghayur and Gilani, 2005) [5]. *Trachyspermum ammi* commonly known as 'Ajwain' is used traditionally against several digestive problems as a digestive stimulant, carminative, antifatulent, and antidiarrhoeal. It has been also proven for antifungal, antioxidant, antimicrobial, antinociceptive, and cytotoxic properties (Ranjan *et al.*, 2011) [16].

Rumifi-H is recommended for use as a stomachic and rumenotonic in cattle. The drug could help improve rumen motility due to the presence of potent herbs that act as rumenotonic, carminative, and stomachic. In the present study following treatment with *Rumifi-H*, cattle suffering from rumen acidosis, bloat and simple indigestion showed a marked improvement that could be due to its activity on rumen microflora, motility, fermentation, and other rumen functions.

Conclusion

The maintenance of optimal animal health and the safe and efficient production of high-quality animal products are the major goals of modern animal production. 30 cattle of various rumen dysfunctions like rumen acidosis, bloat, and simple indigestion were evaluated and managed successfully with an ethno-veterinary medicine, *Rumifi-H* without any side effects. However, further studies involving a larger sample are warranted.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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