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## Incidence of acute ruminal acidosis in Kenguri sheep of Bidar district of Northern Karnataka

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### Abstract

Small ruminants play an important role in Indian economy and are a source of livelihood and employment to millions of rural households. It contributes around 8.5% to the total value of output from livestock sector. Current research is reported from the Bidar district of northern Karnataka Kenguri sheep is one of the famous breed well adopted for the nomadic grazing system of rearing. There was sudden death of the about twenty sheep with the history of accidental grain consumption. Five representative samples of Ruminal contents and intestinal contents were collected aseptically and sent to the Institute of Animal health and Veterinary Biologicals (IAH&VB) Bengaluru-560024, for further analysis like physical examination like colour, consistency of the ruminal fluid, biochemical analysis like the pH, motility of rumen microflora, and Microbiological analysis like gram staining of rumen fluid, Postmortem examination like enlarged liver, hemorrhage in heart, and fluid filled gas accumulated rumen and intestines were observed. The outcome of the current study revealed that the sudden death of the sheep is due to managerial disorders like ruminal acidosis.

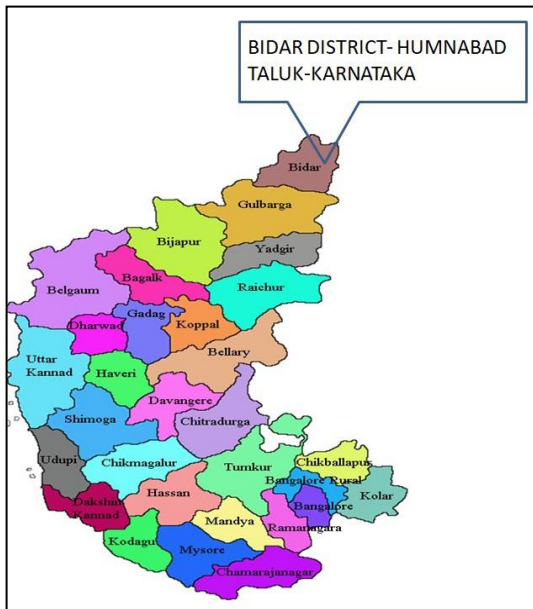
**Keywords:** Small ruminants, ruminal acidosis, Kenguri sheep, grain, examination, analysis

### Introduction

Small ruminants play an important role in Indian economy and are a source of livelihood and employment to millions of rural households. It contributes around 8.5% to the total value of output from livestock sector at current prices (2011-12). Sheep and goats in India are predominantly maintained on natural vegetation on common grazing lands, wastelands and uncultivated (fallow) lands, stubbles of cultivated crops and top feeds. (Chandrappa Shiva Kumar, *et al.* 2017) <sup>[1]</sup>. In northern Karnataka Kenguri sheep is one of the famous breed well adopted for the nomadic grazing system of rearing. Though this breed of sheep is known to be resistant for the diseases but it is prone for the managerial disorders like ruminal acidosis. Ruminal acidosis is one of the commonly encountered clinical conditions in small ruminants like sheep and goat. Incidence of acute ruminal acidosis in small ruminants is severe economical loss to the poor and marginal farmers. Acute ruminal acidosis is mainly caused due to the over accumulation of the lactic acids in the rumen which is further aggravate the condition to cause sudden death of the sheep and goats. Current research is reported from the Bidar district of Karnataka where the nomadic kenguri breed of sheep is affected by acute ruminal acidosis.

### Materials and Methods

Present Study includes the Twenty Kenguri Nomadic Sheep were found to be sudden death with the history of accidental consumption of the grain(jowar) and were not able to drink water in sufficient during the incidence. Five representative samples of Ruminal contents and intestinal contents were collected aseptically and sent to the Institute of Animal health and Veterinary Biologicals (IAH&VB) Bengaluru-560024, for further analysis like physical examination, biochemical analysis, and Microbiological analysis were conducted in order to find out the root cause of the animal death.



**Fig 1:** Depicting the study area in the Humnabad taluk Bidar District Karnataka (17.776147576509015, 77.1301803262141)

**Results and Discussion**



**Fig 2:** Clinical examination of Dead carcass of the Kenguri sheep with the enlarged Rumen and intestine at Humnabad.

**Table 1:** The details of the animals with their age, breed and sex with probable cause of sudden death.

SL No	Breed	Age	Sex	Suspected death due to
1	Kenguri	1.0 yr 6 month	M	Ruminal acidosis
2	Kenguri	2.0 yr	F	Ruminal acidosis
3	Kenguri	1yr 4month	F	Ruminal acidosis
4	Kenguri	1yr 8month	F	Ruminal acidosis
5	Kenguri	2 yr 3month	M	Ruminal acidosis
6	Kenguri	1yr 5month	M	Ruminal acidosis
7	Kenguri	2yr 1month	M	Ruminal acidosis
8	Kenguri	1yr 6month	F	Ruminal acidosis
9	Kenguri	2yr 4 month	M	Ruminal acidosis
10	Kenguri	3yr	M	Ruminal acidosis
11	Kenguri	2yr 5month	F	Ruminal acidosis
12	Kenguri	2yr	M	Ruminal acidosis
13	Kenguri	1yr 2month	M	Ruminal acidosis
14	Kenguri	1yr 3month	F	Ruminal acidosis
15	Kenguri	2yr 2month	M	Ruminal acidosis
16	Kenguri	3yr 2month	M	Ruminal acidosis
17	Kenguri	2yr 2month	F	Ruminal acidosis
18	Kenguri	1yr 8month	M	Ruminal acidosis
19	Kenguri	1yr 2month	F	Ruminal acidosis
20	Kenguri	1yr 9month	M	Ruminal acidosis

The aseptically collected representative samples of ruminal contents were subjected to different examination and the results were depicted as below.

**a. Physical examination**

Ruminal contents were subjected for the physical examined for the physical examination revealed that there is presence of the semi-digested jowar grains and also rumen fluid was in straw colour which is also not the normal colour of the rumen fluid. Further the consistency of the rumen fluid is watery and having putrified smell as per the lab report.

**b. Biochemical Analysis**

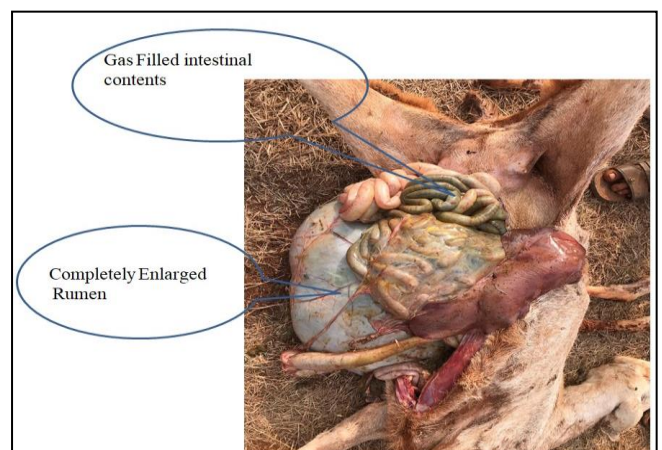
Samples were subjected for the biochemical analysis for the presence of the acidic contents in the rumen and were found to be in the pH range of 3.6 to 4.8. Which is not found to be the normal pH of the rumen as reported earlier 6.4 to6.8 (Jasmin BH *et al.*, 2011) [2]. Also the animals under acute ruminal acidosis did not show any motility in the rumen function.

**c. Microbiological examination**

Further there was no ruminal micro flora was found upon microscopic examination. In addition upon the gram’s staining of the ruminal contents clearly showed the presence of the gram positive organisms suggesting that the animals were died due to the formation of the excessive production of the lactic acids which are easily digestible carbohydrates from the grains.

**d. Postmortem Examination**

Post mortem examination of the sheep carcass clearly shows that the accumulation of watery fluids in the rumen and intestine. Further upon examination there is a gas filled bulged intestinal tissues suggesting the presence of the lactic acid and abnoxious fermented gas accumulated in the intestine. The heart showed epicardial and endocardial hemorrhages also with the enlarged liver as reported by Rahul Kumar *et al.*, 2019 [4]



**Fig 1:** Postmortem Examination of the animal carcass depicting the bulged gas filled conditions of Rumen and Intestine.

The fundamental pathogenesis of accute ruminal acidosis is due to the Ingestion of large quantities of a highly fermentable carbohydrate (grain) by an animal not adapted to such a diet results in rapid production of massive quantities of lactic acids in the rumen (Fig.2). These produced acids have several deleterious effects on the health of the sheep like Acid

damages the epithelium of the rumen, resulting in ruminitis and allowing leakage of bacteria from the rumen into the systemic circulation as reported (N.A. Tufani *et al* 2013) [3]. In the current study during clinical examination, rumen motility, heart rate and respiratory rate were examined found to be nil and are the consequences of the sudden death in the sheep

The drop in pH noticed in the current study is associated with acid production has profound effects on microbial populations in the rumen, resulting in proliferation of lactic acid-producing bacteria and death of others populations, including protozoa with further reduction in pH as reported earlier by Rahul Kumar *et al.*, 2019 [4].

Absorption of lactic acid produced in the rumen into blood results in a profound metabolic acidosis as a sequelae and further leads to the death of the sheep by anoxia and respiratory arrest.

### Conclusion

The outcome of the present study revealed that the cause of the death of the nomadic sheep in humnabad taluk of the Bidar district in Karnataka are due to acute ruminal acidosis and care should be taken to avoid feeding these small ruminants with easily fermentable carbohydrates.

### Acknowledgments

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