



Comparative Study on Clinical Manifestations Associated with Various Fore-stomach Disorders in Buffaloes

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Fore-stomach disorders significantly impact the health and economic productivity of buffaloes. This study analysed the clinical manifestations associated with various fore-stomach disorders in buffaloes over a one-year period. Out of 2145 screened buffaloes, 615 cases were identified with digestive disorders and out of these, 107 were diagnosed with fore-stomach disorders. Clinical assessments included evaluating feed and water intake, diet changes, regurgitation, defecation patterns, and faecal characteristics. The dominant findings revealed a noticeable absence of feed intake (95.33%) and a reduced in water intake (87.85%), the change in diet played a role in this affection, particularly affecting simple indigestion (80.00%) and alkalosis (100%). A complete lack of regurgitation was observed in tympany, Simple indigestion and the condition of traumatic

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reticuloperitonitic were also reported in affected buffaloes. Common disorders included simple indigestion, acidosis, alkalosis, tympany, ruminal impaction, traumatic reticulo-peritonitis, traumatic pericarditis, and diaphragmatic hernia, often presenting with abnormal defecation patterns. These findings underscore the importance of dietary management and clinical monitoring in preventing and managing fore-stomach disorders in buffaloes.

Keywords: Acidosis; alkalosis; buffaloes; simple indigestion; tympany.

1. INTRODUCTION

Forestomach disorders in buffaloes are predominantly caused by dietary factors. Rapid fermentation of carbohydrates can lead to a decrease in ruminal pH and subsequent hypomotility of the forestomach, while putrefaction of ingested feed materials may contribute to an increase in ruminal pH. Buffaloes are particularly susceptible to ruminal disorders due to dietary disturbances, fluctuating ruminal fluid pH levels, reduced ruminal motility, and alterations in microbial flora composition [1].

Feed and water intake decrease due to upset of stomach or indigestion, most commonly Indigestion occurs in large animals due to excessive feeding of grain results in anorexia and ruminal hypomotility to atony (stasis). In this condition faeces are usually soft to watery and foul smelling. In case of traumatic reticulitis most common clinical signs include an arched back, erect hairs at the withers, anxious expression, reluctance to move, and an uneasy, careful gait. Forced sudden movements, as well as defecating, urinating, lying down, and getting up, may be accompanied by bruxism and groaning.

The forestomach of buffaloes plays a vital role in microbial digestion, where diverse species of microflora and fauna participate in fermenting food materials. However, sudden changes in dietary regimens can disrupt the rumen microflora's ability to adapt to the new environment, thereby affecting digestion and overall health [2]. The most common ruminal disorders such as tympany, indigestion and impaction are characterized by poor appetite, altered pH, reduced rumen motility and decreased microbial counts [1]. This study aims to analyse the clinical manifestations associated with forestomach disorders in buffaloes.

2. MATERIALS AND METHODS

The present investigation was conducted at the Veterinary Clinical Complex, College of Veterinary & Animal Science, Navania,

Vallabhnagar, Udaipur. A total of 2,145 buffaloes from various age groups, parity statuses, and lactational stages were included in the study.

These animals were screened for various health conditions, with particular focus on digestive disorders. Among the screened animals, 615 cases were identified with digestive disorders, out of which 107 buffaloes were diagnosed specifically with fore-stomach disorders.

Data collection encompassed multiple parameters, including feed intake, water consumption, types of feed and recent changes in diet, calving status, defecation patterns, faecal colour and consistency, rumination status, milk yield reduction, general appearance, behaviour, regurgitation, tympany, presence of fever, signs of pain, and any treatments administered.

3. RESULTS AND DISCUSSION

Out of 2145 screened buffaloes, 615 cases were identified with digestive disorders and out of these, 107 were diagnosed with fore-stomach disorders. Clinical assessments included evaluating feed and water intake, diet changes, regurgitation, defecation patterns, and faecal characteristics. The results are shown below in tables.

3.1 Feed Intake

In buffaloes affected by fore-stomach disorders, feed intake varied significantly. Most notably, disorders like acidosis, alkalosis, traumatic pericarditis, diaphragmatic hernia, and omasal impaction resulted in complete absence of feed intake (100%). Simple indigestion, tympany, and ruminal impaction also showed high percentages of absent feed intake (91.43%, 95.24%, and 90.90%, respectively). Previous studies have similarly reported anorexia or reduced feed intake in cattle and buffaloes with various fore-stomach disorders by Nagarajan and Rajamani [3]; Prasad and Joshi [4]; Hedao et al. [5]; Rao, [6]; Nwity and Chaudhary, [7]; Gavali et al., [8]; Kumar, [9]; Shah, [10]; Mohan et al., [11]; Turkar et al., [12].

Table 1. History of feed and water intake in various fore-stomach disorders affected buffaloes

S. No.	Characteristic	Observations	Number of fore-stomach affected buffaloes								Total	
			Simple Indigestion (n=35)	Acidosis (n=18)	Alkalosis (n=4)	Tympany (n=21)	Rumen Impaction (n=11)	Traumatic reticulo-peritonitis (n=9)	Traumatic pericarditis (n=5)	Diaphragmatic hernia (n=3)		Omasal Impaction (n=1)
	Feed intake	Reduced	03 (8.57)	00 (00.00)	00 (00.00)	01 (4.76)	01 (9.09)	00 (00)	00 (00.00)	00 (00.00)	00 (00.00)	05 (4.67)
		Absent	32 (91.43)	18 (100)	04 (100)	20 (95.24)	10 (90.90)	09 (77.78)	05 (100)	03 (100)	01 (100)	102 (95.33)
	Water Intake	Decreased	28 (80.00)	18 (100)	04 (100)	20 (95.24)	10 (90.90)	06 (66.67)	04 (80.00)	03 (100)	01 (100)	94 (87.85)
		Normal	07 (20.00)	00 (00.00)	00 (00.00)	01 (4.76)	01 (9.90)	03 (33.33)	01 (20.00)	00 (00.00)	00 (00.00)	13 (12.15)

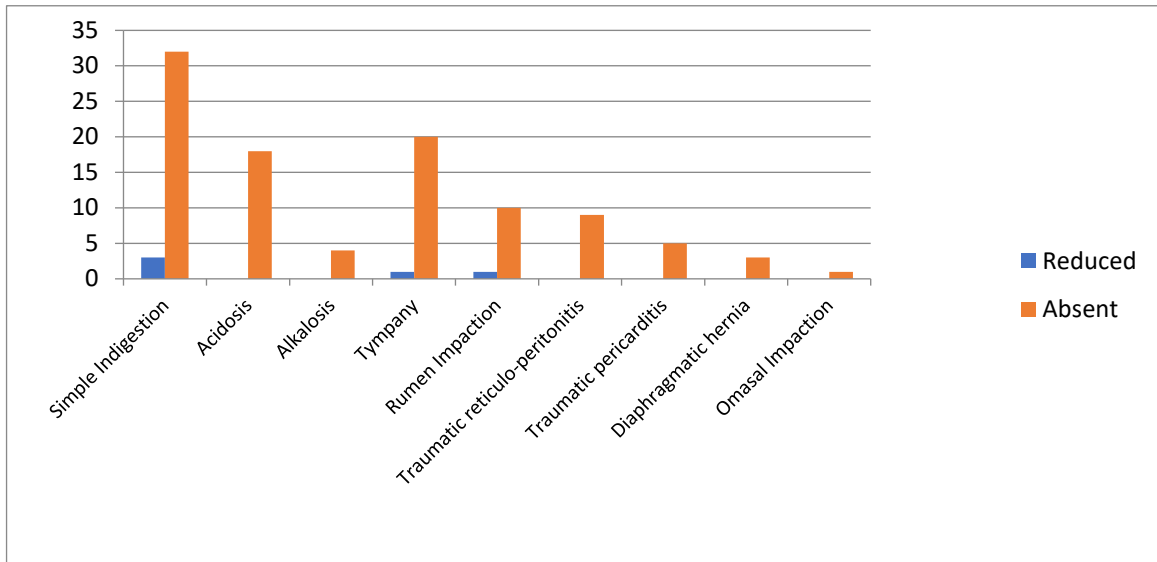


Fig. 1. History of feed intake in various fore-stomach disorders affected buffaloes

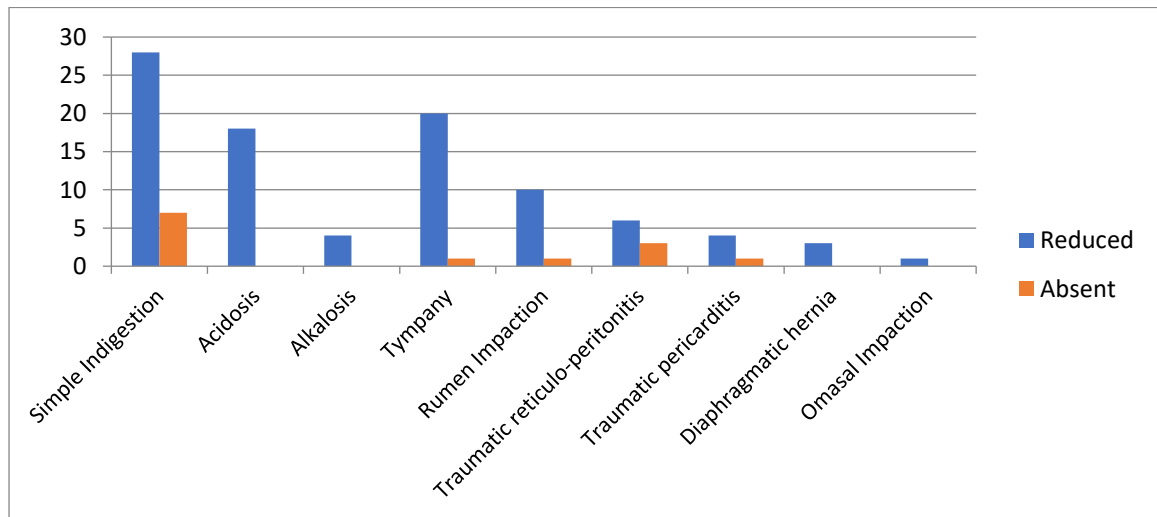


Fig. 2. History of water intake in various fore-stomach disorders affected buffaloes

3.2 Water Intake

87.85% of buffaloes affected by fore-stomach disorders showed reduced water intake, whereas only 12.15% maintained normal water intake. This finding aligns with previous research Nagarajan and Rajamani [3]; Prasad and Joshi [4]; Hedao et al. [5]; Rao, [6]; Nwity and Chaudhary, [7]; Gavali et al., [8]; Kumar, [9]; Shah, [10]; Mohan et al., [11]; Turkar et al., [12] indicating decreased water consumption in buffaloes suffering from fore-stomach disorders.

3.3 Change in Diet

Except for traumatic reticulo-peritonitis, traumatic pericarditis, and diaphragmatic hernia, most

buffaloes affected by fore-stomach disorders had experienced a recent diet change. Percentages varied among disorders, with simple indigestion (80.00%) and alkalosis (100%) showing higher incidences of diet change. This observation is consistent with findings reported by Ather et al. [13].

3.4 Regurgitation

Regurgitation was observed in a minority (5.60%) of cases across different fore-stomach disorders, primarily in simple indigestion, tympany, and traumatic reticulo-peritonitis. Bhutia [14] similarly reported regurgitation in 5.40% of cases, indicating a low occurrence in these disorders.

Table 2. History of diet change and regurgitation in various fore-stomach disorders affected buffaloes

S. No.	Characteristic	Observations	Number of fore-stomach affected buffaloes								Total	
			Simple Indigestion (n=35)	Acidosis (n=18)	Alkalosis (n=4)	Tympany (n=21)	Rumen Impaction (n=11)	Traumatic reticulo-peritonitis (n=9)	Traumatic pericarditis (n=5)	Diaphragmatic hernia (n=3)		Omasal Impaction (n=1)
	Change in diet	Yes	28 (80.00)	16 (88.88)	04 (100)	20 (95.23)	08 (72.72)	00 (00.00)	00 (44.44)	00 (00.00)	01 (100)	79 (73.38)
		No	07 (20.00)	02 (11.11)	00 (00)	01 (4.76)	03 (27.27)	09 (100)	03 (66.66)	03 (100)	00 (00.00)	28 (26.17)
	Regurgitation	Yes	01 (2.85)	00 (00)	00 (00)	02 (9.52)	01 (9.09)	01 (11.11)	00 (00.00)	01 (33.33)	00 (00.00)	06 (5.60)
		No	34 (97.14)	18 (100)	04 (100)	19 (90.48)	10 (90.90)	08 (88.88)	05 (100)	02 (66.66)	01 (100)	101 (94.39)

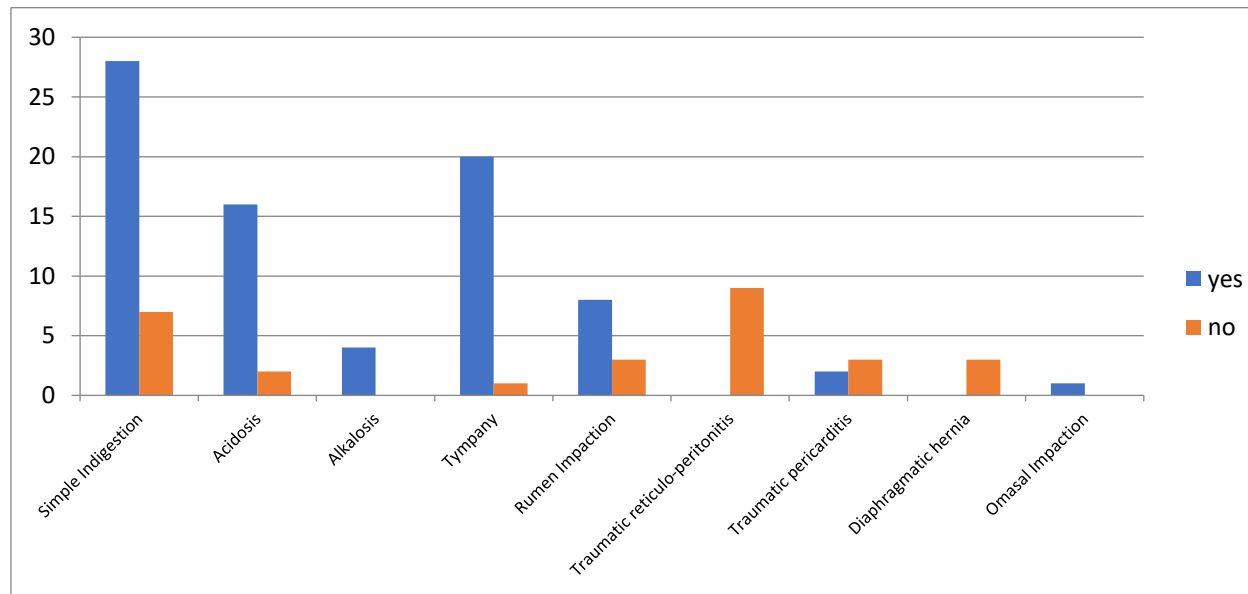


Fig. 3. History of diet change in various fore-stomach disorders affected buffaloes

Table 3. History of defaecation various fore-stomach disorders affected buffaloes

S. No.	Characteristic	Observations	Number of affected buffaloes								Total	
			Simple Indigestion (n=35)	Acidosis (n=18)	Alkalosis (n=4)	Tympany (n=21)	Rumen Impaction (n=11)	Traumatic reticulo-peritonitis (n=9)	Traumatic pericarditis (n=5)	Diaphragmatic hernia (n=3)		Omasal Impaction (n=1)
1.	Defaecation	Absent	20 (57.14)	10 (55.56)	02 (50)	14 (66.67)	00 (00)	01 (11.11)	00 (00)	00 (00)	00 (00)	47 (43.92)
		Normal	13 (37.14)	02 (11.11)	02 (50)	03 (14.28)	04 (36.36)	01 (11.11)	01 (20)	00 (00)	01 (100)	27 (25.23)
		Constipated	00 (00)	06 (33.33)	00 (00)	01 (4.76)	07 (63.64)	06 (66.67)	04 (80.00)	03 (100)	00 (00)	27 (25.23)
		Loose	02 (5.71)	00 (00)	00 (00)	03 (14.29)	00 (00)	01 (11.11)	00 (00)	00 (00)	00 (00)	06 (5.60)
2.	Colour& Consistency of faeces	Black or Tary	00 (00)	00 (00)	00 (00)	00 (00)	07 (00)	08 (66.67)	04 (80.00)	00 (00)	00 (00)	19 (17.75)
		Mucous coated	09 (25.71)	03 (16.67)	00 (00)	03 (14.29)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	15 (14.01)
		Clay	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	03 (100)	00 (00)	03 (2.80)
		Scanty/Pasty	13 (37.14)	13 (72.22)	02 (50)	15 (83.33)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	43 (40.19)
		Normal	13 (37.14)	02 (11.11)	02 (50)	03 (14.28)	04 (36.36)	01 (11.11)	01 (20)	00 (00)	01 (100)	27 (25.23)

3.5 Defecation

Among buffaloes affected by fore-stomach disorders, 43.92% exhibited complete loss of defecation, 25.23% reported constipation, and 5.60% had loose feces. Only 25.23% had normal defecation. Various disorders displayed abnormal defecation patterns, consistent with previous findings with Radostitis et al., [1]; Saini et al., [15]; Ather et al., [13]; Hussain and Uppal, [16].

3.6 Faeces Characteristics

In buffaloes affected by fore-stomach disorders, 40.19% passed scanty or pasty feces, 25.23% had normal feces, and 17.75% exhibited black or tarry-colored feces indicative of foreign bodies in the reticulum. Specific disorders like alkalosis (83.33%), acidosis (72.22%), and tympany (50%) showed high occurrences of passing scanty or pasty feces. Similar feces abnormalities were reported in previous studies by Singh et al., [17]; Venu et al., [18]; Radostitis et al., [19].

Due to indigestion, gas accumulation and presence of foreign body, animal feeling pain and a burning feeling or discomfort in abdomen. Occasional indigestion or upset the stomach is normal but due to foestomach affection it happens regularly for a few weeks or months. In this condition affected buffaloes suffering from gastroesophageal reflux issues, ulcer and other diseases and finally results comes in form of anorexia, bloating, excess production of gases, stop the regurgitation, change the colour of faeces and loud growling. Primary ruminal tympany is a disorder in animals caused by the accumulation of gases in the rumen. This leads to small gas bubbles being trapped in the stable foam of the rumen contents. As a result, Intraruminal pressure increases because animals cannot blech. this condition can occur for so many reasons, forestomach disorders are main causes, which only affect their formation and show impact.

4. CONCLUSION

This study concludes that stomach disturbances in buffaloes directly affect their diet and other physiological parameters. Buffaloes affected by fore-stomach disorders exhibited a complete absence of feed intake and low water intake. Most of the buffaloes showed congested mucous membranes and mild dehydration. In chronic

cases of fore-stomach disorders, the consistency, volume, and composition of feces become abnormal, likely due to prolonged retention of ingested food in the alimentary tract or increased intestinal peristaltic movements.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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