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Review

Diagnosis of Bovine Gastrointestinal Disorders in The Field: A Review

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Abstract

The diagnosis of bovine gastrointestinal disorders can be daunting in the field due to the lack of adequate facilities. The range of digestive diseases which may occur in cattle is challenging and a careful analysis is required before treatment protocol is advised. However, much can be achieved by using a methodical approach, and many diseases may be successfully treated if the correct diagnosis is achieved. This article describes some clinical and diagnostic tests of the bovine abdomen that can be performed under minimal available facilities to better diagnose gastrointestinal disorders in the field. These tests will help to achieve a diagnosis or will help in decision-making for the referral. The detailed clinical examination and laboratory procedure are not discussed in this article. Where appropriate, some specific conditions not related to the digestive system and some infectious diseases have been mentioned for differential diagnosis purposes only.

Keywords: Abdominal Distension, Digestive Diseases, Palpation, Peritoneal Fluid, Rumen Fluid Analysis

Introduction

Digestive system disorders of cattle and buffaloes are a major concern to field veterinarians. Bovine gastrointestinal (GIT) disorders are broadly classified into functional and fermentative disorders (Garry and McConnel, 2009). The fermentative disorders include simple indigestion, acidic indigestion, and alkaline indigestion. The functional disorders are of two types–functional disorders of the forestomach and abomasum (Constable *et al.,* 2017).In forestomach disorders (cranial functional disorders or omasal transport failure) there appears to be achalasia of the reticulo-omasal orifice and in abomasal disorders (Caudal functional disorders or pyloric stenosis) there appears to be achalasia of the pylorus (Constable *et al.,* 2017).The recent changes in animal production and feeding practices have led to an increase in the incidence of bovine gastrointestinal disorders in India (Hussain *et al.,* 2015; Sharma *et al.,* 2015; Kumar *et al.,* 2020; Hussain *et al.,* 2021b). So, field veterinarians must be updated about the diagnosis of the economically important digestive diseases of cattle and buffaloes.

The diagnosis of any disease relies on a detailed clinical examination which should be systematic including a meaningful history, examination of the patient and environment, and further diagnostic investigations. The history taking and detailed examination are not discussed here. Only the clinically relevant and field-applicable findings and economic cow-side tests are discussed in this paper. It is essential to consider these findings of a specific topographic examination holistically to avoid misinterpretation

Specific Clinical Signs of Abdominal Disorders Detected by Observation

Observing an animal at a distance can provide very useful information. Ideally, observation should be performed with the patient in a normal environment. In bovines, the signs of various systematic diseases may overlap and hence detailed clinical examination and laboratory evaluation is warranted to arrive at a diagnosis. The clinical signs of gastrointestinal diseases are not specific to a particular disease but some clinical signs are specific to digestive diseases in general e. g. loss of defecation can occur in many digestive diseases like rumen impaction (Hussain and Uppal, 2012), omasal impaction (Hussain *et al.,* 2013), peritonitis (Hussain and Uppal, 2014), intestinal obstruction (Hussain *et al.,* 2015b), etc. but it is unlikely for a cattle with the non-digestive disease to have a loss of defecation. The specific clinical signs which indicate a GIT disease are described below.

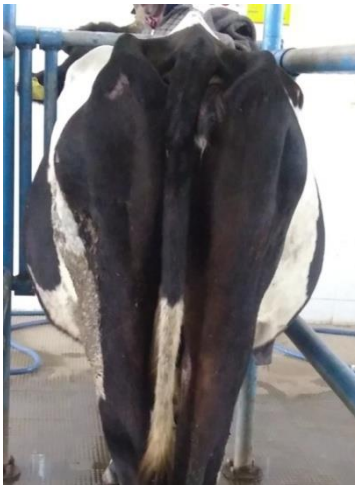
Behavioral Signs: The behavioral signs are usually due to abdominal pain and include kicking at the abdomen, standing with abducted elbows, reluctance to get up and down, movements made with care, grunting, and grinding of the teeth (Belknap and Navarre, 2000; Constable *et al.,* 2017). The most common causes of abdominal pain in cattle are intestinal obstruction, traumatic reticuloperitonitis/pericarditis, and abomasal ulcers (Henniger and Mullowney, 1984; Hussain *et al.,* 2015b; Constable *et al.,* 2017; Hussain *et al.,* 2017b; Hussain *et al.,* 2018b; Bhutia *et al.,* 2019). The other reported causes of abdominal pain in bovines include omasal impaction, caecal dilatation, and late pregnancy indigestion (Hussain *et al.,* 2012; Hussain *et al.,* 2013; Hussain *et al.,*2014b). In addition to digestive disease, some thoracic diseases can also result in abdominal pain e. g. pleuritis, severe pulmonary emphysema, and advanced pneumonia (Constable *et al.,* 2017). It is important to remember that in acute TRP the grunt may be present for only 3-5 days after initial penetration of the reticulum (Constable *et al.,* 2017)

Abdominal Distension: The abdomen should be observed from a distance of a few meters from behind the animal to get an overall impression of the abdominal shape. Each side of the animal should be viewed from an oblique angle to highlight changes in the lateral contours. The abdomen is split into four quadrants - left dorsal, left ventral, right dorsal, and right ventral. Abnormalities of the contours within each quadrant should be noted. The distension of the abdomen may be asymmetrical or symmetrical, dorsal or ventral, or both. Distension of the left dorsal abdomen because of ruminal tympany is the most common form of distension. In animals that have been anorectic for several days, the abdomen may be smaller than normal and the dorsal sac will be collapsed (Rumen Collapse). Fig. 1 represents various forms of abdominal distension in cattle.

Abnormal Posture: Like behavioral signs, abnormal posture is also usually due to abdominal pain but may also occur in laminitis. *Arching of the back* usually *i*ndicates subacute pain e. g. due to TRP (Fig 2) and *lowering of the back i*ndicates acute pain e. g. intestinal obstruction.

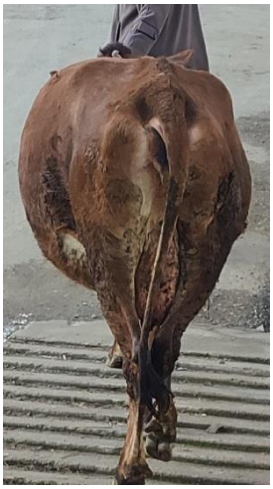
Rocking Horse Posture*:* Lowering the back, stretching the forelegs forwards and the hindlegs backward (intussusception) (Cockcroft and Jackson, 2004).

Type of abdominal distension	Common cause
Distended left dorsal quadrant	Ruminal bloat (Cockcroft and Jackson, 2004)
Distension of right dorsal quadrant	Caecal dilatation, right displaced abomasum, abomasal volvulus, torsion of spiral colon (Hussain *et al.*, 2012; Constable *et al.*, 2017)
Bilateral dorsal symmetrical distension	Pneumoperitoneum (Cockcroft and Jackson 2004)
Bilateral ventral symmetrical distension	Lactic acidosis, hydrops, diffuse peritonitis, advanced pregnancy, uroperitoneum, ascites (Hussain *et al.*, 2014)
Distension of right ventral abdomen	In some cases of Abomasal impaction (Constable *et al.*, 2017)
Sprung left costal arch	Left displaced abomasum (Cockcroft and Jackson, 2004).
Papple shaped abdomen	Vagal indigestion (Hussain *et al.*, 2014)



Normal abdominal contour

Smaller than normal abdomen due to chronic anorexia in TRP



Left side abdominal distension due to frothy bloat

Right dorsal distension due to caecal dilatation

Bilateral abdominal distension and lose feces due to acute grain engorgement

Papple shaped abdomen due to vagal indigestion

Fig. 1: Various forms of abdominal distension in cattle

Fecal Signs

Loss of defecation, Reduction or increase in the quantity of feces: Reduction in the bulk of feces may be due to decreased feed intake or reduced passage through the alimentary tract (functional obstruction) or physical obstruction. In most cases in Bovidae, loss of defecation is due to functional obstruction due to TRP, rumen, omasal and abomasal impaction, and peritonitis (Hussain and Uppal,2012; Hussain *et al.*, 2013; Hussain and Uppal, 2014; Constable *et al.*, 2017; Hussain *et al.*, 2020b; Hussain *et al.*, 2022). In carbohydrate engorgement, the feces are

usually increased in amount and are sweet-sour smelling. In most other diseases of ruminant stomachs, the feces are reduced in amount (scant) and they are pasty, foul smelling, and appear over-digested because of increased transient time in the alimentary tract. A complete absence of feces for 24-48 hrs is not uncommon with diseases of the ruminant stomach and may be confused with an intestinal obstruction or the earliest stages of hypocalcemia in a recently calved mature cow (Constable *et al.*, 2017).

Fig. 2: Arched back in a cow suffering from foreign body syndrome

Perineal Staining: Occurs in diarrhea

Communition of feces and other substances in feces: A high content of poorly digested plant fibres indicates poor rumen function. Excessive communition occurs due to increased transient time *e. g.* due to abomasal displacement and abomasal ulcers. Poor communition suggests dental disease and reticulo-omasal transport failure. The main causes of omasal transport failure are TRP and vagal indigestion. The presence of a mucus plug in the rectum suggests functional obstruction (Fig. 3) (Hussain and Uppal, 2012; Hussain *al*., 2013). Fibrinous casts suggest chronic enteritis. The presence of undigested grain particles in feces suggests grain engorgement.

Fig. 3: Frank mucus balls collected during a rectal examination of a cow suffering from omasal impaction

Fig. 4: Black pasty feces from a cow suffering from bleeding abomasal ulceration

Disease	**Characteristic findings with respect to feces**
Salmonellosis	Dysentery, fibrinous casts, foul-smelling feces
Winter dysentery	Acute profuse watery diarrhea and dysentery
Johne's disease	Chronic diarrhea
Molybednosis	Chronic diarrhea without smell, mucous or blood
Ostertagiasis	Persistent diarrhea without smell, mucous or blood
Coccidiosis	Subacute dysentery
Carbohydrate engorgement	Profuse foul-smelling diarrhea
Renal amyloidosis	Profuse chronic diarrhea

Color and odor of feces: Melena (Fig. 4) is often associated with abomasal ulcers (Hussain *et al.*, 2011), and hemorrhage from the intestine usually results in frank blood in feces. Minor abomasal ulcers may not result in frank melena but occult blood in feces (Hussain *et al.*, 2015a). The objectionable odour may be due to putrefaction or fermentation of ingesta due to inflammation, peritonitis, Salmonellosis, and pericarditis.

Other Signs

Straining in an attempt to defecate: Suggests rectal tenesmus.

***Dropping of the cud*:** Associated with straw impaction of the rumen, esophageal dilatation, ruminitis (usually due to sub-acute rumen acidosis), and pathology involving the cardia.

***Dyspnea*:** Occurs due to severe bloat and pain.

***Vomition*:** Occurs rarely in ruminants but has been reported in the reticular diaphragmatic hernia (Fig. 5) (Hussain *et al.*, 2021c), vagal indigestion, and some organophosphorus toxicity (Constable *et al.*, 2017).

Fig. 5: Vomition through nostrils in buffalo suffering from RDH

Field Level Procedures/Test for Diagnosis of Various GIT Disorders

The tests that can be performed in the field for the diagnosis of bovine gastrointestinal disorders are summarized below.

1. **Oro-gastric intubation**: Patency of the esophagus is determined by passing a stomach tube in conscious cattle. The stomach tube should be 2m long with a 1-2 cm internal diameter.

2. **Determination of rumen fill and consistency:** Rumen fill is examined by inspection and palpation. Anorexia of prolonged duration results in a collapsed rumen. Overfilling of the rumen in spite of chronic anorexia occurs if there is a failure of transport of ingesta from the reticulo-rumen or in free gas bloat. The dorsal sac of the rumen is directly examined by palpation through the left paralumbar fossa to characterize its consistency. In a normal animal, the contents of the upper part of the rumen have a doughy consistency, but digital pressure should not leave a lasting impression once palpation ceases. Rumen consistency gets altered in different gastrointestinal disorders.

Rumen consistency	**Indication/s**
Doughy	Normal rumen consistency
Mushy	Frothy bloat, vagus indigestion, reticular abscess, reticular diaphragmatic hernia (RDH), and peritonitis (Hussain and Uppal, 2014; Hussain *et al.*, 2014b, Hussain *et al.*, 2021c)
Soft and fluid like	Ruminal acidosis, diffuse peritonitis, and intestinal obstruction (Hussain and Uppal 2014; Hussain *et al.*, 2015b)
Firm or hard	Rumen impaction (Hussain and Uppal, 2012; Hussain *et al.*, 2020b)

3. **Rumen motility:** The rumen motility can be detected by observation (at the left paralumbar fossa), palpation, and auscultation using a stethoscope (Constable *et al.*, 2017). Auscultation is the most sensitive of the three methods. The normal rumen motility is 3 per 2 minutes and changes in rumen motility are an important indicator of many diseases. Hypomotility is associated with a number of conditions, including TRP, carbohydrate engorgement, simple indigestion, rumen impaction, abomasal ulcers, milk fever, endotoxemia, and other painful conditions of the abdomen (Garry and McConnel 2009; Hussain *et al.*, 2011; Hussain and Uppal 2012; Hussain *et al.*,2017b, Bhutia *et al.*, 2019). Hypermotility is less common and is associated with conditions such as frothy bloat, vagal indigestion (initial stages) (Hussain *et al.*, 2017a), reticular abscess, and some cases of reticular diaphragmatic hernia (Hussain *et al.*, 2021c).

4. **Reticular Auscultation:** It is done at the 6-7th intercostal space on the left side of the abdomen at the costochondral junction (Leek, 1983). The reticular sounds are fluid splash sounds, generally occurring at of intervals one minute. Simultaneous auscultation of the reticulum and palpation of the rumen is done to differentiate primary and secondary reticulo-rumen motility cycles (William's method of auscultation). Auscultation of reticular sounds at the 3rd-5th intercostal space is suggestive of reticular diaphragmatic hernia (Hussain *et al.*, 2020a).

5. **Palpation of Liver:** In cattle, the liver is situated entirely in the right half of the abdominal cavity. Topographically it is covered by the right ribcage and cannot be palpated in its normal state. If the liver in cattle is grossly enlarged its edge can be felt on deep palpation caudal to the costal arch, usually at the middle third. The edge of the enlarged liver is usually rounded and thickened, compared to the more defined edge of its normal counterpart. The liver may be enlarged and palpable in case of advanced right-sided congestive heart failure, multiple liver abscesses, chronic liver fluke infection, diffuse hepatitis, and sometimes hydatid cysts of the liver (Cockcroft and Jackson, 2004).

6. **Percussion and simultaneous auscultation:** Percussion and simultaneous auscultation over both sides of the abdomen is a useful diagnostic technique to elicit 'pings' or 'pungs'- resonant sounds indicating the presence of excessive quantities of gas in the lumen of the gastrointestinal tract or in the peritoneal cavity. A ping is high pitched resonant musical sound, a pung is a low-pitched resonant musical sound. The commonly known ping is associated with left or right displacement of the abomasum and caecal dilatation (Hussain *et al.*, 2012) (Fig.6). Pneumoperitonium results in bilateral ping sounds (Belknap and Navarre, 2000). Percussion over distended loops of the intestine containing fluid and gas will also result in a ping. A pung is a low-pitched sound commonly heard by percussion and auscultation over an atonic rumen containing some gas. The other causes of ping in the right flank are torsion of the spiral colon, and gas in the distended colon and rectum.

   A combination of deep palpation, ballottement, and simultaneous percussion and auscultation and succession of the right abdomen is used to detect the viscera distended with gas and/or fluid or ingesta. The fluid splash sounds on a succession of the right abdomen may be due to fluid-filled intestines in acute intestinal obstruction, enteritis, paralytic ileus, and fluid-filled abomasum in right side displacement. A fluid splash on the left ventral quadrant is indicative of rumen lactic acidosis (Nagy, 2017) and obstruction of the cardia (Hussain *et al.*, 2014a).

Fig. 6: Demarcated ping area in the right flank of a cow having caecal dilatation

7. **Rumen fluid examination:** The evaluation of rumen fluid parameters is an essential procedure for the diagnosis of fermentative disorders (Garry and McConnel, 2009). Rumen fluid can be collected via an oro-gastric tube

(Constable *et al.,* 2017) or by puncture of the ventral sac of the rumen (Nordlund and Garret, 1994; Hussain *et al.,*2013). Under field conditions, the following parameters of rumen fluid can be evaluated.

a) **Color:** Normal color varies with nature and type of feed. Olive green or greenish brown is considered as normal color.

Grasses	Yellowish green
Leguminous fodder	Dark green
Straw	Yellow-brown or brownish
Frothy bloat	Yellowish
Ruminal acidosis	Milky gray
Putrefaction of contents	Blackish green

b) **Consistency:** Normal fluid is slightly viscous in consistency (Nagy, 2017). A more viscous sample indicates salivary contamination or frothy bloat (primary or secondary to vagal indigestion and RDH). Watery consistency indicates inactive microflora due to fermentative disorders (acidic or alkaline indigestion, rumen impaction) and secondary indigestion.

c) **Odor:** Normal odor is slightly aromatic. The odor is less prominent when the microflora is inactive. The abnormal odors include the sour or acidic smell of ruminal acidosis, the ammoniacal smell of urea poisoning, and the foul odor of putrefied contents (Garry and McConnel, 2009)

d) **pH:** The rumen fluid pH should be examined immediately after the sample is obtained using a wide range (1-11) pH paper (Nagy, 2017). The rumen fluid pH is normally 6.2 to 7.2 in cattle on a roughage-based diet and 5.5 to 6.5 in cattle on a concentrate-based diet. In anorexic cattle, because of the constant production of saliva which has an alkaline pH and a lack of substrate for the rumen flora to produce volatile fatty acids, the pH will be alkaline and usually in the range of 7.5 to 8.0. The functional disorders which result in increased rumen pH are generally chronic in nature e. g. vagal indigestion, RDH, and chronic peritonitis due to any cause (Hussain *et al.*, 2021c). As it is impossible to exclude saliva completely from the rumen fluid sample collected by the stomach tube, a minor false elevation of the rumen pH likely occurs in such cases (Nordlund and Garret, 1994; Garret *et al*., 1999).

   Primary rumen alkalosis should be only considered when the diet fed to animals suggests the possibility of rumen alkalosis. Excessive feeding with non-protein nitrogenous substances like urea or accidental ingestion of ammonium salts may cause rumen alkalosis.

e) **Sedimentation-flotation test:** This test is an indirect measure of the activity of the rumen microflora (Driksen and Smith, 1987). It must be performed immediately after the collection of the sample otherwise it may not be an accurate measure of microflora activity. The sample of rumen fluid is placed in a glass tube or measuring cylinder. The time is measured for complete sedimentation and flotation of solid particles. The finer particles sink and the coarser particles float, buoyed by gas bubbles of fermentation. In healthy cattle, the normal time for sedimentation and floatation is 4 to 8 minutes. Inactive microflora results in rapid sedimentation with little floating material, and this may occur in lactic acidosis, prolonged anorexia, and inactive microflora caused by indigestible roughages. When ingesta are frothy (frothy bloat or some cases of vagal indigestion and RDH), there may be no appreciable sedimentation and floatation.

f) **Elicitation of anterior abdominal pain:** Tests of pain sensitivity in the anterior abdomen are performed by subjecting the animal to various physical tests namely deep palpation, withers pinch, xiphoid pressure, Nikow's pole test, and slope test (Belknap and Navarre, 2000; Cockcroft and Jackson, 2004). The grunt in these tests is heard (with or without a stethoscope) due to the discomfort caused by pain. These test help in the localization of pain due to TRP, perforated abomasal ulcers (Braun *et al.,*2018; Hussain *et al.,* 2011; Hussain *et al.* 2017b), or some thoracic diseases as mentioned earlier.

g) **Rectal examination** should be done in a systemic manner. First examine the left abdomen, then the mid, and finally the right abdomen. Normal rectal mucosa is slippery and soft. Abnormal mucosa can be sticky, thickened,

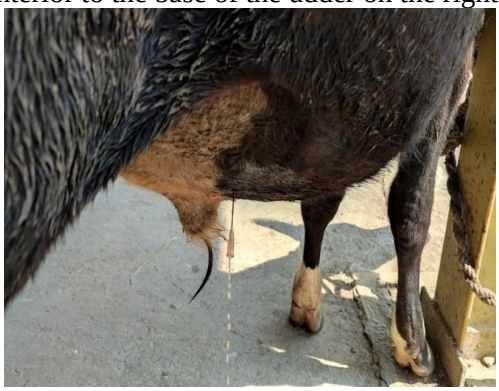
rough, and bleeds easily (Hussain and Uppal, 2014; Hussain *et al.*, 2014b). Palpate the rumen for size and consistency. Normally abomasum is not palpable but may be occasionally palpable in right-sided torsion of the abomasum. Normal intestines are palpable as soft indistinguishable loops. Gaseous distension is not a marked feature of small intestine obstruction in cattle. The presence of a firm sausage-shaped mass, which may be painful to touch is suggestive of intussusception (Constable *et al.*, 1997). Multiple dilated intestinal loops palpable in the pelvic cavity are reported to be suggestive of intestinal volvulus (Hussain *et al.*, 2015b) in Presence of a large blind sac at the pelvic inlet suggests caecal dilatation. The rectal examination also helps in the diagnosis of rumen impaction (Hussain and Uppal, 2012; Hussain *et al.*, 2020b) and could also help in the subjective assessment of omasal impaction and peritonitis (Hussain *et al.*, 2013; Hussain and Uppal, 2014).

The purpose of the rectal examination is to determine the presence or absence of abnormalities of the gastrointestinal tract which are not detectable with general clinical examination or abnormalities that might explain certain clinical findings. The presence of ping over the right abdomen in a cow may suggest the presence of dilated caecum, dilated abomasum, or intestinal tympany. A rectal examination may reveal the presence of gas-filled viscous which accounts for the ping, and the location of the viscous may provide clues to its identity. In other situations, the general clinical examination may reveal no evidence of specific abnormality in an animal with gastrointestinal dysfunction, but a rectal examination may reveal the presence of peritoneal adhesions, distended viscera, or multiple intra-abdominal masses. As a part of the differential diagnosis of digestive tract diseases in the postparturient cow, the uterus should be carefully examined for evidence of retained placenta and metritis. So, both rectal and vaginal examinations should be performed in such a cow (Constable *et al.*, 2017).

8. **Collection of peritoneal fluid and its physical characteristics:** Examination of peritoneal fluid is one of the important diagnostic tests in bovine gastroenterology to assess the status of the peritoneal cavity (Hussain *et al.*, 2021d). But unfortunately, this procedure has not been utilized to its potential in the Indian scenario. The procedure is routinely performed at only a few Veterinary Institutes in India like Guru Angad Dev Veterinary and Animal Sciences University (Hussain *et al.*, 2015b; Hussain *et al.*, 2022). With the increase in the incidence of TRP in Kashmir valley, there is a need to perform this test routinely, especially for chronic anorexia cases (Hussain *et al.*, 2021a) and there is a need to train field veterinarians for performing this procedure in field conditions. At the Faculty of Veterinary Sciences and Animal Husbandry, SKUAST-Kashmir, peritoneal fluid analysis has been utilized for the evaluation of bovine obstructive urolithiasis (Parrah *et al.*, 2010), TRP in cattle (Hussain *et al.*, 2021a) and peritonitis in sheep (Hussain *et al.*, 2018a).

   The choice of sites for paracentesis is a problem because the rumen covers such a large portion of the ventral abdominal wall and avoiding penetration of it is difficult. Cattle have a low volume of peritoneal fluid, and failure to obtain a sample is not unusual. The most profitable sites are those that, on an anatomical basis, consist of recesses between the forestomach, abomasum, diaphragm, and liver (Constable *et al.*, 2017, Hussain *et al.*, 2021d). These are usually

   a) Caudal to the xiphoid sternum and 4-10 cm lateral to the midline
   b) Left of the midline, 3-4 cm medial and 5-7 cm cranial to the foramen for the left subcutaneous abdominal vein (Fig. 7A).
   c) Just anterior to the base of the udder on the right side (Fig. 7B)



Midway between the xiphisternum and the umbilicus avoiding the milk vein

Anterior to the mammary gland attachment to the body wall

Fig. 7: Sites for abdominocentesis

A 16-gauge 5 cm hypodermic needle can be used. The needle is pushed carefully and slowly through the abdominal wall, which will twitch when the peritoneum is punctured. When this happens the fluid will usually run out into a vial without the aid of a vacuum. However, if it does not, a syringe may be used and the needle may be moved backward and forwards in a search for fluid, with the piston of the syringe withdrawn.

Failure to obtain a sample does not preclude the possibility that peritonitis may be present: the exudate may be very thick and contain large masses of fibrin, or the peritonitis may be localized (Hussain *et al.,* 2021d). Also, animals that are dehydrated may have less peritoneal fluid than normal (Constable *et al.,* 2017) but practically the clinical cases of peritonitis yield peritoneal fluid despite the fact that the animals are dehydrated (Hussain and Uppal, 2014; Hussain *et al.,* 2015b; Hussain *et al.,* 2021a; Hussain *et al.,* 2022). However, most animals from which samples cannot be obtained are in fact normal. In animals in which peritonitis is strongly suspected for clinical reasons, up to four attempts of paracentesis should be made before aborting the procedure. The fluid should be collected into an anticoagulant, preferably EDTA, to avoid clotting. Abnormal peritoneal fluid in cattle is a highly sensitive indicator of peritoneal disease, but not a good indicator of the nature of the disease. Under field conditions, the peritoneal fluid should be examined for volume, color, consistency, odor, and clotting time.

Volume: In normal animals, the volume of collected fluid may range from 1 to 5 ml. The continuous flow of 10-20 ml per sample indicates excessive fluid. The causes of excessive fluid are ruptured bladder, ascites (clear yellow), acute diffuse peritonitis (yellow, turbid), infarction, or necrosis of the gut wall (thin, red-tinged).

Color: (Belknap and Navarre 2000; Hussain and Uppal 2014; Constable *et al.,* 2017; Bhutia *et al.,* 2019) (Fig. 8).

Normal fluid	Straw to yellow color
Green	Food material
Orange green	Rupture of the biliary system
Pink-red	Hemoglobin, degenerated or entire RBCs, damage to the vascular system by infarction or perforation
Red-brown	Late stages of necrosis of the gut wall, degenerated blood, or hemoglobin
Blood like	Hemoperitonium, dicoumarol poisoning, or rupture of the uterus or bladder (rare)

Fig. 8: Photograph showing different colors of peritoneal fluid collected from the individual animals suffering from peritonitis

Consistency/turbidity: Normal fluid is crystal clear. Turbidity indicates the presence of an increased number of leukocytes and proteins, which may include fine strands of fibrin (Hussain *et al.,* 2018a).

Odor: The presence of smell may be due to the presence of gut contents within the peritoneal cavity, due to septic

peritonitis, or a ruptured bladder.

Clotting time: The normal peritoneal fluid rarely clots on standing. Fluid with high viscosity clots on standing.

Conclusion

Due lack of diagnostic facilities in the field the diagnosis of bovine GIT diseases is a challenging job. This paper describes some characteristic clinical signs of specific GIT diseases and a few cow-side tests for the diagnosis of GIT diseases in the field. Remember that failing to look can lead to more errors than failing to know. Without a competent clinical examination, it is doubtful that a disease will be correctly diagnosed, and mistakes may be made in the treatment, control, and prognosis of the condition.

Contribution by Authors

The authors contributed equally.

Conflict of Interests

There is no conflict of interest.

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