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Diarrhoeain Ruminantsand Its Control. A Review

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Abstract: *Several enteropathogens are associated with diarrhoea in adult ruminants & newborn calves. Their relative prevalence varies geographically, but the most prevalent infections in most areas are Bacterial, Viral, Parasitic and Protozoal.Specific therapy and prevention are detailed under the individual headings. Out of all the combinations, Norfloxacin and Tinidazole is found to be most effective treatment in bacterial and protozoal diarrhoea. Also herbs like Aeglemarmelos (Belgiri), Acacia catechu (Kattha) and Zingiberofficinale (Sonth) showing significant results in the treatment of diarrhoea in ruminants.*

Keywords:*Diarrhoea, Aeglemarmelos (Belgiri), Acacia catechu (Kattha), Zingiberofficinale (Sonth)*

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I. Introduction

Diarrhoea is a common problem in ruminants. The clinical presentation can range from mild diarrhoea without systemic disease to profuse, acute diarrhoea associated with rapid dehydration, severe disturbance of acid-base and electrolyte balancewith fatal manifestation in new born calves, lambs & kids. This discussion emphasizes the disease in adult ruminants and new born calves, but the principles of pathophysiology and treatment apply to lambs and kids as well.

II. Etiology

Several enteropathogens are associated with diarrhoea in adult ruminants & newborn calves. Their relative prevalence varies geographically, but the most prevalent infections in most areas are Bacterial, Viral, Parasitic and Protozoal. Cases of diarrhoea are commonly associated with more than one of these agents and the cause of most outbreaks is multifactorial. Determining the particular agents associated with an outbreak of diarrhoea is important. Broadly, diarrhoea may beof infectious or non-infectious origin.

1.1 Infectious diarrhoea is caused by Bacteria, Virus and Protozoa.

1.1.1 Bacterial Diarrhoea is caused by: E coli, Salmonella spp, Staphylococcus spp, Clostridium Perfringens,

1.1.2 EnterobacterSpp, Mycobacterium paratuberculosisetc.

1.1.3 Viral Diarrhoea is caused by: Rotavirus, Coronavirus etc.

1.1.4 Parasitic Diarrhoea is caused by: Strongylus spp., Trichonema spp. Etc.

1.1.5 ProtozoalDiarrhoea is caused by: Giardia spp,Eimeriabovis,Entamoebaspp, Trichomonasspp etc.

1.2 Non Infectious diarrhoeamay be due to

1.2.1 Dietary indiscretions- Cases of simple indigestion may lead to diarrhoea and is common in grain overload. It also follows ingestion of toxic amounts of chemicals (eg, arsenic, copper, zinc, and molybdenum) or certain poisonous plants and mycotoxicoses, and organophosphate poisoning can also cause diarrhoea.

1.2.2 In Calves milk replacers with poor quality, heat-denatured proteins or with excessive amounts of soybean or fish protein or carbohydrates of non-milk origin have a higher risk of producing diarrhoea.

1.2.3 There is some evidence that oral administration of chloramphenicol, neomycin, or tetracycline to young calves for 3–5 days can result in villous change with resultant malabsorption and mild diarrhoea. Prolonged and high-dose antibiotic treatment of calves can lead to diarrhoea associated with reduction of beneficial bacteria of the gastro intestinal track.

II. Pathophysiology Of Diarrhoea

2.1 Diarrhoea in ruminants is usually associated with disease of the small intestine and can be caused by hyper secretion or malabsorption. Hyper secretorydiarrhoea develops when an abnormal amount of fluid is secreted into the gut, exceeding the absorptive capacity of the mucosa.

2.2 In malabsorptivediarrhoea, the capacity of the mucosa to absorb fluid and nutrients is impaired to the extent that it cannot keep up with the normal influx of ingested and secreted fluids. This is usually the result of villous atrophy, in which the loss of mature enterocytes at the tips of the villi results both in a decrease in

villous height (with a consequent decrease in the surface area for absorption) and in loss of the brush border digestive enzymes. The extent and distribution of villous atrophy varies with different pathogens and can explain variation in the severity of clinical disease.

2.3 Inflammation in intestine leads to vascular and lymphatic damage and to structural damage of the crypt-villus unit. Most infectious forms of diarrhoea have hypersecretory, inflammatory, and malabsorptive components, although one usually predominates. These lead to a net loss of water, sodium, potassium, and bicarbonate; if severe, the calf develops hypovolemia, hyponatremia, acidemia, and prerenal azotemia and also there is marked increase in peristaltic movements of intestine.

III. Treatment And Control Of Diarrhoea

While suggesting a treatment regimen of Diarrhoea, an eye should be kept on eradication of the cause (infectious or noninfectious) as well as correction of the physiological disturbances (eg. Peristaltic movements) of GI Tract. This will not only check the proliferation of causative agent but will also normalize the intestinal functions leading an early recovery. Various drugs are available in the market for treatment of infection caused by bacteria, protozoa and to check secondary infection caused by viral diarrhoea. Out of all the combinations,Norfloxacin and Tinidazole is found to be most effective treatment in bacterial and protozoaldiarrhoea. **Norfloxacin** is a synthetic broad spectrum antibacterial agent belonging to the Fluoroquinolone group. It exerts its bactericidal effect by inhibiting the subunit of DNA gyrase, an essential enzyme involved in DNA replication.**Tinidazole** is a nitromidazole which has antimicrobial action against microphillic protozoa *Giardia lamblia*, *Entamoebabovis* and *Trichomonas* spp. and against obligate anaerobic bacteria. It acts by damage of DNA strands or inhibition of their synthesis.

IV. Role Of Herbs In The Control & Treatment Of Non-Infectious Diarrhoea

India has a rich and diversified flora. It is seen that herbal medicines are relatively nontoxic, cheaper and are eco-friendly. Moreover, the people have used them for generations. They have also been used in day-to-day problems of healthcare in animals. 25% of the drugs prescribed worldwide come from plants. Almost 75% of the medicinal plants grow naturally in different states of India. These plants are known to cure many ailments in animals like poisoning, cough,diarrhoea, constipation, foot and mouth disease, dermatitis, cataract, burning, pneumonia, bone fractures, snake bites, abdominal pains, skin diseases etc. Many herbs regulate the peristaltic movements of intestine, provide healthy environment for growth and multiplication of micro flora. And regenerate damaged epithelial cells to restore absorptive surface.Some of the herbs which possess a great value to restore G.I. functions and repair G.I. mucosa are:

4.1 Aeglemarmelos (Belgiri): is used as herbal drug since many centuries. This drug is recommended in the treatment of diarrhoea and various other GIT disorders. It forms protective layer on mucosal surface of intestine and reduces the severity of Diarrhoea.

4.2 Acacia catechu (Kattha): Taxifolin present in heartwood of Acacia catechu wild is found to be responsible for its antibacterial effect. In vitro, Acacia catechu Wild is reported to have broad spectrum antimicrobial and antifungal activity.

4.3 Zingiberofficinale (Sonth): Zingiberofficinale is a common spice, which is in use for the treatment of various gastrointestinal, pulmonary, cardiovascular and sexual disorders since antiquity in Unani and Ayurvedic medicines. It mainly possesses anti-diarrhoeal, antidiabetic, hypolipidaemic activity, anti-inflammatory and antinociceptive, antioxidant, antibacterial, anti-parasitic, hepatoprotective, antidepressant, gastroprotective, antiatherosclerotic, cardioprotective activities etc.

V. Additional Recommendations- For Management Of Diarrhoea

5.1 Always administer clean water or barley water at intervals of 2 to 3 hours to complete for the loss of body fluids.

5.2 Dosing activated charcoal with water may be of benefit in cases of poisoning. Limewater, tannic acid or commercial diarrhoea remedies could be used to treat the diarrhoea.

5.3 Quarantine practices to be followed for introducing new animals in the present herd.

5.4 Isolating calves in separate calf rearing area.

5.5 Harvesting colostrums from cows with cleaned and sanitized udders.

5.6 Feeding colostrums to calves by bucket, and thereafter feeding only milk replacer or pasteurized milk.

5.7 Preventing contamination of calf feedstuffs, water or bedding by effluent from the adult herd.

VI. Conclusion

Diarrhoea is a common problem in ruminants which may be of infectious or non-infectious origin. Various drugs are available in the market for treatment of infection caused by bacteria, protozoa and to check secondary infection caused by viral diarrhoea. Out of all the combinations, Norfloxacin and Tinidazole is found to be most effective treatment in bacterial and protozoal diarrhoea. Also we can go for some of the valuable

herbs like *Aeglemarmelos*(Belgiri), *Acacia catechu* (Kattha) *and Zingiberofficinale*(Sonth) which are naturally found in India as antidiarrhoeal treatment. Over all, proper farm management practices are to be followed for controlling diarrhoea in the herd.

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