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Therapeutic Potential of Medicinal Plants and Spices in Treating Digestive Disorders of Livestock

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Efficient digestive function is fundamental to livestock health, productivity, and economic sustainability in animal husbandry systems. Livestock are generally vulnerable to various digestive disorders such as indigestion, anorexia, off-feed conditions, absence of rumination, and certain diseases including foot-and mouth disease, fever, and bluetongue particularly in goats. There is a traditional method to cure these digestive related problems using various spices, medicinal and herbal plants. Generally 1 or 2 medicinal leaves and spices are used in curing livestock digestive problems. But there are many leaves and spices helps in curing livestock digestive problems. Herbal and medicinal plants like tulsi (*Ocimum sanctum*), neem (*Azadirachta indica*), Malabar nut (*Justicia adhatoda*), guava leaves (*Psidium guajava*), curry leaves (*Murraya koenigii*), Giloy (*Tinospora cordifolia*), betel leaf (*Piper betle*), Aavaram Senna (*Senna auriculata*), and spices including fenugreek (*Trigonella foenumgraecum*), cumin (*Cuminum cyminum*), Black Pepper (*Piper nigrum*), turmeric (*Curcuma longa*), garlic (*Allium sativum*), and ajwain (*Trachyspermum ammi*), Dry ginger (*Zingiber officinale* Rosc.) have the active ingredient in curing the Livestock digestive problems. This review aims to explain that these plants and spices helps in curing livestock digestive problems more effectively when combined together.

Keywords: Medicinal, herbal plants and spices, digestive problems, livestock, growth and performance.

Effects of Medicinal Leaves and Spices in Livestock Digestion

1. Neem (*Azadirachta indica*)

Bioactive compounds present in neem includes nimbin and nimbidin, which possess potent anti-inflammatory, antibacterial, and anti-ulcer activities. These compounds help in reducing inflammation of the rumen and intestinal mucosa caused by infections, poor-quality feed, or dietary stress.

Their antimicrobial action suppresses pathogenic bacteria in the gut, thereby restoring microbial balance and improving rumen fermentation. Nimbolide, a bioactive triterpenoid, also plays a crucial role in digestive health. It exhibits strong antioxidant and antibacterial effects, which protect the gastrointestinal lining from oxidative damage and microbial toxins. This protective action is particularly beneficial in cases of enteritis and chronic digestive disturbances. Neem leaves further contain flavonoids, such as quercetin, which contribute to their antioxidant and antispasmodic properties. These compounds help reduce intestinal irritation, improve gut motility, and support better digestion and nutrient utilization. In addition, flavonoids enhance the animal's natural defense mechanisms against digestive infections. The presence of tannins in neem contributes to its astringent action, making it useful in controlling diarrhea and excessive intestinal secretions. Tannins help strengthen the intestinal lining and reduce fluid loss, thereby normalizing fecal consistency. Saponins,

another important component, exhibit antimicrobial and rumen-modulating effects, helping maintain a healthy balance of rumen microflora essential for efficient fermentation.

2. Curry leaves (*Murraya koenigii*)

Traditionally curry leaves have been used as a treatment for rheumatism, wounds, dysentery, diarrhea and snake bites. Curry leaves (*Murraya koenigii*) have long been used in traditional and ethnoveterinary practices as a natural remedy for digestive ailments in livestock. The leaves of the plant have been utilized for medicinal purposes, addressing ailments such as dysentery, diarrhoea, and vomiting. In a research, curry leaves have been demonstrated to be effective in treating diarrhoea, a prevalent gastrointestinal disorder. The leaves contain various bioactive substances such as, flavonoids, phenolic compounds, and alkaloids. These substances have antibacterial qualities that prevent the growth of bacteria that cause diarrhoea, like *Salmonella* spp.

3. Guava (*Psidium guajava*)

This plant shows a variety of biological activities such as antidiarrheal, antimicrobial, antioxidant, spasmodic, antidiabetic, antitussive activity. Tannins possess strong astringent properties that help reduce intestinal secretions, control diarrhea, and improve fecal consistency. They also protect the gut lining. Flavonoids like Quercetin, Kaempferol exhibit antimicrobial and anti-inflammatory actions, helping to control gut infections and reduce intestinal inflammation. Essential oils like Caryophyllene show antispasmodic and antimicrobial effects, aiding in relief from abdominal discomfort and improving gut motility. Saponins help regulate intestinal microflora and enhance digestion by reducing harmful microbes. Phenolic compounds provide antioxidant protection, supporting gut health and recovery during digestive stress.

4. Tulsi (*Ocimum sanctum*)

The essential oils present in tulsi also stimulate digestive secretions and enhance appetite, making it effective in managing anorexia and off-feed conditions in livestock. Phenolic compounds and flavonoids present in tulsi support rumen health by stabilizing microbial populations and improving fermentation efficiency. Ursolic acid and other triterpenoids present in tulsi contribute to its hepatoprotective and immunomodulatory effects, indirectly supporting digestion by enhancing liver function and metabolic efficiency. Tulsi is also known for its adaptogenic and anti-stress properties, which play a crucial role in mitigating stress-induced digestive disorders commonly observed in livestock during transportation, climate stress, or management changes.

5. Aavaram senna (*Senna auriculata*)

Senna auriculata (commonly known as Aavaram) leaves are rich in phytoconstituent such as Alkaloids, terpenoids, phenols, tannins, steroids, saponins. It has Anti-bacterial, Antioxidant, anticytotoxic, hepatoprotective action, Anti-inflammatory action, Wound healing, Anti-ulcer properties.

6. Giloy (*Tinospora cordifolia*)

Giloy is used to treat other ailments Like weakness, dysentery, dyspepsia infections, secondary syphilis, impotency, viral hepatitis etc. It also contains phenolic compounds which have a good influence on rumen fermentation and increase ruminant output efficiency. *Tinospora cordifolia* is a potent immunostimulant, and it has certain positive influence on immune status and health of dairy animals.

7. Malabar nut (*Justicia adhatoda*)

Fresh leaves paste is given to cattle for diarrhea, dysentery, and gastrouble. The dry powdery leaf is used for wound healing. The decoction of leaves is antispasmodic, Expectorant, abortifacient, and also used for curing dysentery in cattle.

8. Betel leaf (*Piper betel*)

Betel leaf (*Piper betel*) contains several biologically active compounds such as eugenol, chavicol, chavibetol, and essential oils. These constituents possess strong carminative, antimicrobial, and digestive stimulant properties, which help improve rumen activity in livestock. Betel leaf aids in relieving indigestion, bloating, and flatulence by enhancing

enzyme secretion and reducing harmful microbial load in the gut. Its antimicrobial action also helps control infections that may cause off-feed conditions, thereby improving appetite and overall digestive health in cattle and goats.



Medicinal plants

9. Ajwain (*Trachyspermum ammi*)

Medicinally, it has been proven to possess various pharmacological activities like antifungal, antioxidant, antimicrobial, antinociceptive, cytotoxic, hypolipidemic, antihypertensive, antispasmodic, bronchodilating actions, antilithiasis, diuretic, abortifacient, antitussive, nematicidal, anthelmintic and antifilarial. Anthelmintic activity of *T. ammi* shows its effect against specific helminths, e.g. *Ascaris lumbricoides* in humans and *Haemonchus contortus* in sheep. Anthelmintic activity of *T. ammi* is exerted by interference with the energy metabolism of parasites through potentiation of ATPase activity and thus loss of energy reserves. The plant has also been reported to possess cholinergic activity with peristaltic movements of the gut, thus helping in expulsion of intestinal parasites which might also be a contributory factor to its anthelmintic activity.

10. Fenugreek (*Trigonella foenum-graecum*)

Feeding fenugreek grain to cattle has been a Common practice for ages in India to avoid Stomach-related problems and improve animal milk quality. In dairy cow fenugreek seed feeding increased milk's functional fatty acid profile, decreased blood cholesterol levels, and reduced cholesterol levels in milk. In goats Fenugreek supplementation improves milk Output, plasma constituents and growth hormone. In broiler chicken addition of seeds to the diet raised plasma Concentrations of total protein and globulin. Supplementation of diets with a mixture of fenugreek And black cumin improved body weight gain.

11. Black Pepper (*Piper nigrum*)

Pepper is well known for its multiple medicinal uses, particularly in gastrointestinal disorders, such as constipation, diarrhea, indigestion, and dyspepsia. Pepper has been repeatedly documented in many books of traditional medicines particularly for its usefulness in diarrhea. Pepper has been reported to have antibacterial, antihistaminic, digestive enzyme stimulatory, gastric acid secretory, anti-androgenic, antioxidant, hypolipidemic, growth stimulatory, immune enhancing, and chemopreventive effects. In addition, piperine has also

been cited as possessing anti-asthmatic, anti-inflammatory and anti-arthritis, antihypertensive, antitumor, acyl-coenzyme A:cholesterol acyltransferase inhibitory, antibacterial, and analgesic activities.

12. **Cumin** (*Cuminum cyminum*)

In Ayurveda cumin seeds are notably considered carminative, eupeptic, antispasmodic, astringent and are used for treating mild digestive disorders, diarrhea, dyspepsia, flatulence, colic, abdominal distension, edema, broncho-pulmonary disorders, puerperal disorders, analgesic and as a cough remedy.

13. **Turmeric** (*Curcuma longa*)

Turmeric is commonly utilized as a natural remedy to treat various digestive disorders such as indigestion, diarrhea, bloating, and gastrointestinal infections. The Active ingredient present in turmeric is curcumin which enhances growth performance Immunomodulator, feed additives, Antiinflammatory, antiseptic, reducing the mortality due to ascites, hypoglycemic, hypolipidemic and antioxidant Curcumin possesses strong anti-inflammatory, antioxidant, and , which plays significant role in maintaining gastrointestinal health in livestock. Curcumin stimulates the secretion of bile and digestive enzymes, thereby enhancing digestion and improving feed utilization in animal.

14. **Garlic** (*Allium sativum*)

Ethno-veterinary use of garlic was found for curing urinary problems like oliguria & anuria, bloat, foot and mouth disease, pleuropneumonia, otalgia, dog bite, snake bite, trembling, respiratory system disorder like pleuritis and pneumonia, yoke gall, bone fracture, flatulence, wounds and gangrene. Due to allicin and other sulfur compounds, garlic has antibiotic, antibacterial and antimycotic properties. Ready availability of garlic in every household can be a cost effective first aid or emergency prescription to the livestock rearers who have no immediate access to modern veterinary facilities.

15. **Dry Ginger** (*Zingiber officinale* Rosc)

Ginger can increase saliva secretion, which causes increased secretion and activity of digestive enzymes, ultimately improving the digestive process.

The rhizome helps increase the absorption of essential nutrients to promote animal growth, accelerate the digestive process, and slow down the feed passage rate through the digestive tract . They further reported improved feed stability and gastrointestinal ecosystem by inhibiting the growth of pathogenic microorganisms.



Spices

Conclusion

Livestocks are easily vulnerable to various digestive problems like indigestion, anorexia, off feed, absence of rumination, and they are also affected easily to many diseases like foot and mouth diseases, fever, blue tongue in goats etc. The spices, medicinal and herbal plants are effective in curing the digestive problems and also act as immunity booster and prevents the cattle from various diseases like foot and mouth diseases, fever and blue tongue. The combined effect of these leaves and spices cures the digestive problems much more effectively.