e-ISSN: 3048-8796

COMMON POISONOUS PLANTS AND THEIR HARMFUL EFFECTS IN LIVESTOCK

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Poisonous plants cause great economic losses to farmers by negatively affecting the livestock through their direct and indirect effects. These effects include a wide range of symptoms like bloat, diarrhea, liver damage, neurological problems, cardiovascular issues, photosensitization and even death. The toxic principles in poisonous plants are primarily organic compounds like alkaloids, glycosides, and oxalates, which can be harmful if ingested or touched. These toxic compounds, also called phytotoxins, are a form of chemical defense to protect plants from predators and can cause illness or death in humans and animals by disrupting bodily functions. Although grazing is considered as normal routine in livestock management, it exposes the animals to a variety of poisonous plants particularly when there is reduction in fodder availability. Poisoning can occur either by accidental ingestion of plants with usual feed or by willful consumption of toxic plants when pastures are dry. In most of the plant poisoning cases, the treatment includes symptomatic and supportive therapy. The ultimate goal of treatment should be removal of toxins from the body. Treatment includes administration of activated charcoal, liver tonics, anti-allergic and fluid therapy. Removing the poisonous weeds from the grazing area and providing good quality forages reduces the risk of plant poisoning.

1) Castor bean (Ricinus communis)

The main toxic principles in the castor bean plant are the proteins ricin and ricinine. Ricin is a highly potent toxin, classified as a ribosome-inactivating protein, that disrupts protein synthesis in cells. Ricin works by entering cells and inhibiting protein synthesis, which leads to cell death and tissue damage. Ricinine is another toxic alkaloid found in the plant. Ricin is a heat labile protein which can be destroyed during the extraction process. The initial toxicity signs include abdominal pain, profuse watery diarrhea, dehydration, cessation of rumination, muscle twitching, dullness of vision, convulsions, weakness and dehydration. Treatment of Ricinus communis poisoning includes general and symptomatic therapy as there is no antidote against ricin. Oral administration of activated charcoal to adsorb toxins would be helpful. Intravenous fluid therapy is necessary to combat dehydration and fluid loss in affected animals.

2) Lantana camara

Lantana poisoning in animals results from the ingestion of toxic varieties of the plant Lantana camara. This plant contains the triterpene acids lantadene A and lantadene B. These toxins are present in the roots, leaves, stems, and unripe fruit, and doses as small as 5 g of dried leaves can be fatal for cattle and sheep. The lantadenes cause intrahepatic cholestasis by damage to the canaliculi (small bile ducts). Though the exact mechanism of action has not been identified, studies suggest lantadene A and B alter membrane function that ultimately results in impaired Na/K ATPase in biliary epithelial cells. Affected animals are anorectic, dehydrated, and icteric along with rumen stasis and showed hepatogenous photosensitization. Rumen stasis prolongs the absorption of the toxin. Species affected by lantana poisoning include cattle, sheep, goats, guinea pigs and rabbits. Young animals are most at risk. Lantana poisoning can best be treated by preventing further absorption of toxins. This can be achieved by giving a large quantity of activated charcoal into the rumen together with a large volume of a multiple electrolyte solution to stimulate ruminal motility and rehydrate the animal. Treatment for photosensitive dermatitis should also be given.

3) Bracken fern

Bracken is most widely distributed of all fern

species. The toxic principle is Ptaquiloside (a well known carcinogenic compound). There is also thiaminase factor, enzymes that effect the use of thiamine by the animal and aplastic anaemia factor causing bone marrow suppression. This is an acute disease and death in cattle can result following ingestion of young bracken fronds. In cattle, bracken fern chronic toxicity causes multiple tumours in the urinary bladder wall and haemorrhages in the urinary bladder mucosa leading to a condition called bovine enzootic haematuria. It is characterised by haematuria, chronic cystitis in cattle with possible straining and pain during urination and a variety of benign and malignant neoplastic conditions of the urinary bladder. Apart from toxicosis resulting in thiamine deficiency, bracken fern poisoning is essentially untreatable. Thiamine may be administered; antimicrobial administration and blood and platelet transfusions can be attempted but are often of limited value.

4) Ageratum houstonianum (Neela Phoolnu)

Ageratum houstonianum poisoning is toxic, primarily affecting livestock, and can cause liver damage and hemorrhagic disease due to the presence of pyrrolizidine alkaloids. This plant is easily identifiable by small blue terminal flowers in axillary heads and capitulate flowers. Ageratum is an annual plant that tends to become a pest in gardens and pastures. Fresh green leaves and stem are mainly toxic. The toxic signs are mainly due to the presence of constituents like Precocene-I, Precocene-II and Pyrrolizidine alkaloids. Clinical signs for Ageratum toxicosis in ruminants are characterized by either an acute haemorrhagic course or sub-acute photodynamic dermatitis. Inappetence, reduced water intake, general depression, atony of GIT and blood-tinged black faeces are the common clinical signs. Treatment is supportive and symptomatic, focusing on managing the liver dysfunction, as there is no specific antidote.

5) Ohi poisoning (Albizia stipulata)

Albizia stipulata is a synonym for Albizia chinensis, a large deciduous tree native to tropical Asia. It is known by various common names, such as Chinese Albizia or white siris, and is used for timber, shade, and as a source of gum. Ohi poisoning, caused by consuming leaves from the Albizia stipulata tree, primarily affects livestock such as cattle, calves, sheep, and goats. Albizia, a genus of medium sized trees, found in abundance in Himachal Pradesh where they are grown to provide shade to the tea bushes and for the manurial value of its fallen leaves. Saponin and tannin are the main toxic components. A. stipulata are mainly responsible for toxicosis in ruminants. Depression, dullness, anorexia, grinding of teeth, dyspnea, oliguria, loose mucoid faeces and muscular stiffness are commonly seen clinical signs in ruminants with ohi poisoning. Treatment include saline purgatives, liver extract, dextrose saline and rumen cud transplantation.

6) Subabul poisoning (Leucaena leucocephala)

Leucaena is a very important protein source for ruminants in all parts of South-East Asia. In spite of many beneficial nutritional properties, it contains the toxic nonprotein free amino acid β-(3-hydroxy-4-oxopyridyl) α-amino-propionic acid i.e. mimosine limits their utilization. Toxicity of mimosine may occur due to inhibition of tyrosine utilizing enzyme or incorporation of mimosine into biologically vital proteins in place of tyrosine. Clinical signs includes alopecia, excessive salivation, loss of appetite, in coordination of gait, enlarged thyroid gland are the main clinical symptoms in cattle. According to some studies, decrease reproductive performance in cattle also observed. Mimosine containing feeds should not be fed exclusively to the animals. The supplementation of mineral mixture containing iron along with drying of feeds is recommended, as sun drying usually destroys some mimosine content of the feed.

GENERAL PREVENTION METHODS

- **Identification:** Identification of poisonous plants is an crucial steps in preventing the poisoning. One the plants are identified we can remove them from pastures and hay supplies.
- **Eradication:** Physically remove or treat poisonous weeds to prevent their spread.
- **Pasture Management:** Cultivation of adequate desirable forages in the pastures to reduce the likelihood of livestock eating toxic plants. Overgrazing should be avoided.
- **Observation of sick animals:** Observe animals frequently for early signs of poisoning and seek immediate veterinary attention.
- **Nutritional supplements:** Provide nutritional supplements to correct deficiencies that can make animals more susceptible to plant poisoning.
- **Education:** Inform farmworkers and livestock

owners about the risks associated with poisonous plants.

CONCLUSION

Poisonous plants pose a significant threat to livestock, causing direct economic losses like death, abortion, and reduced productivity, as well as indirect losses from treatment costs and management changes. Management solutions include isolating pastures, providing supplemental feed, and ensuring quick, accurate diagnosis of symptoms and toxins to mitigate long-term damage and loss.

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