POISONOUS PLANTS IN LIVESTOCK FEEDING

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Each year, numerous livestock are injured, killed, or suffer a reduction in performance when they ingest poisonous plants. Livestock, under conditions of adequate feed, will avoid most poisonous plants due to low palatability. However, when feed is short, livestock are hungry, or mixed in hay, plants normally avoided become a tempting source of feed, thus presenting a potential poisoning. When an animal goes off feed, loses weight, colics, or appears unhealthy, poisonous plants may be the cause. Poisonous plants contain toxic compounds which can injure or kill livestock, even in small doses. Others contain substances which cause a reduction in performance, such as weight loss, weakness, rapid pulse, or recumbency.

Poisonous plants should be considered as the potential cause of disease, especially if the following situations exist: 1. forage supply in a pasture is sparse due to overgrazing, drought or poor early season growth, 2. animals have recently been moved into a new pasture, 3. animals have been released into a new pasture when hungry, 4. herbicides have recently been used to control weeds, 5. pasture has recently been fertilized with nitrogen, 6. a new forage source (i.e. hay or pasture) has been fed.

Caution should also be used when controlling poisonous plants in a pasture. Some herbicides may increase the palatability of these weeds. Therefore, it is important to read the herbicide label and follow all grazing restrictions. Also, if there are poisonous plants in the pasture, it is best to keep all livestock out until the plants have died or until the grazing restriction listed on the herbicide label has passed. Other management recommendations to avoid problems with poisonous plants include: 1. avoid overgrazing pastures, 2. avoid turning hungry animals into new pastures, 3. learn to identify poisonous plants, 4. fence off areas in pastures where poisonous plants are found, 5. control and/or manage weeds, 6. follow herbicide grazing restrictions listed on the label, 7. supply adequate amounts of clean, fresh water at all times, 8. consult a veterinarian if a poisoning is suspected, 9. examine pastures, hay fields, roadsides and fence rows for poisonous plants, 10. in a drought year, or a year when feed is short, take extra precautions, and look for poisonous plants in new areas planned for grazing or haying.

Caution should be made when considering a poisonous plant in a diagnosis. The mere presence of a poisonous plant does not confirm a poisoning has occurred. Evidence of poisonous plant ingestion, symptoms, and diagnostic tests should all be used to confirm a poisoning. Since other diseases can present symptoms similar to poisonous plants, conferring with a veterinarian is essential. Tables 1 through 11 list plants poisonous to grazing livestock most commonly found in Minnesota and surround states.

Table 1. Toxic plants that affect the cardiovascular system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Japanese Yew *Taxus caspidata*	Bovine Equine Ovine Caprine Porcine	Trembling, incoordination, or found dead.	Taxine derivatives.	When ingested.	0.1 to 0.5% BW.	Treatment often not possible. Remove source, charcoal, oil, and cardiac drugs.
Milkweed *Asclepias* species, Rhododendron *Rhododendron* species, Oleander *nerium oleander*, and Foxglove *Digitalis* species.	Bovine Equine Ovine Caprine Porcine	Weakness, depression, edema, weakness, seizures, or found dead.	Cardenolides (also called glycosides).	When ingested.	Unknown	Treatment often not possible. Remove source, charcoal, oil, and cardiac drugs.
Tall Fescue[1] *Festuca arundinacea* infested with endophyte *Neotyphodium coenophialum*	Bovine Equine Ovine Porcine	Reproductive loss, fescue foot, summer slump, and fat necrosis.	Ergovaline produced from the endophyte	When grazed fresh and dried in hay.	Unknown	Avoid planting endophyte infected or enhanced fescue. Remove pregnant mares 45 days before foaling.

[1]Is also considered to affect the reproductive system.

Table 2. Toxic plants that affect the dermal system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Mold infected clover *Trifolium* species and alfalfa *Medicago sativa*	Equine	Severe sunburn or photosensitivity	Infestation with *Cymodothea trifolii*	When grazed fresh.	Unknown	Remove from source, and topical treatments for skin lesions.
Wild parsnip *Patinaca sativa*	Bovine Equine Ovine	Severe sunburn or photosensitivity	Furanocoumarins	When grazed fresh and dried in hay.	Unknown	Remove from source, move animals to a shaded area, and topical treatments for skin lesions.

Table 3. Toxic plants that affect the gastrointestinal system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Corn cockle seeds *Agrostemma githago*	Bovine Equine Porcine	Severe gastroenteritis.	Unknown	When ingested.	0.1 to 0.25 % BW for bovine and porcine. Unknown for equine.	Remove from source and demulcents.
Mustard seeds *Brassica* species	Bovine Equine Porcine	Severe gastroenteritis, salivation, diarrhea, and death.	Thiocyanates (mustard oils)	When ingested.	0.001 % BW for bovine. Unknown for equine and porcine.	Remove from source and demulcents.
Moldy Red Clover *Trifolium pretense*	Equine	Hypersalivation and diarrhea.	Slaframine	When grazed fresh.	Unknown	Remove from source, and hydrate if necessary.
Nightshade *Solanum* species	Bovine Equine Ovine Porcine	Anorexia, nausea, abdominal pain, and diarrhea.	Solanine	When grazed fresh and dried in hay.	0.1% BW Highly variable.	Emetic, charcoal, cathartic, demulcents, and fluids.
Spurge *Euphorbia* species	Bovine	Irritation and blistering of the mouth and GI tract, diarrhea, and hemorrhage.	Resins	When grazed fresh. Not commonly found in baled hay.	3 kg	Emetic, charcoal, cathartic, and dilute with protein.

Table 4. Toxic plants that affect the hematopoietic system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Brakenfern *Pteridium acquilinum* and Field Horsetail *Equisetum arvense*	Bovine Equine	Seizure and/or muscle twitch in equine. Death or fever in bovine	Unknown	When grazed fresh and dried in hay.	100% BW for 1 to 4 months.	Remove from source, blood, antibiotics, and antihistamine.
Maple *Acer* species	Equine	Depressed, lethargic, anorexic, and red-brown urine.	Unknown	Ingestion of dried or wilted leaves.	1.5 to 3.0% BW	Remove from source, charcoal, mineral oil, fluids, and blood.
Moldy Sweetclover *Melilotus* species	Bovine Equine	Bleeding	Dicoumarol	Ingestion of moldy hay containing sweetclover.	50 to 70 ppm dicoumarol	Remove from source, vitamin K_1, and blood transfusions.

Table 5. The toxic plant that affects the hepatic system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Cocklebur seedlings *Xanthium strumarium*	Bovine Equine Ovine Caprine Porcine	Anorexia, vomiting, dyspnea, prostration, and death.	Carboxytractyloside	When seedlings are grazed fresh.	0.75 to 1.5 % BW	Remove from source. Oral administration of a fatty substance may slow absorption.

Table 6. Toxic plants that affect the musculoskeletal system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Black walnut[1] *Juglans nigra*	Equine	Laminitis, stocking up, and hyperthermia.	Unknown	Hoof contact with black walnut heartwood via shavings for 4 to 12 hours.	5 to 20% of black walnut heartwood in shavings.	Remove from source, oil, charcoal, bute, hydrotherapy, and fluids.
Hoary Allysum[2] *Berteroa incana*	Equine	Fever, stocking up, and founder.	Unknown	When grazed fresh and dried in hay.	Variable. Mostly greater than 10% of diet.	Remove from source, oil, charcoal, bute, hydrotherapy, fluids, possibly DMSO.
White Snakeroot *Eupatorium rugosum* and Rayless Goldenrod *Iscoma wrightii*	Bovine Equine Caprine	Reluctant to move, stiff gait, sawhorse stance, muscle tremors, and death.	Tremetol	When grazed fresh and dried in hay.	5 to 10% BW for bovine, unknown for equine, and 5 mg/k of BW for some caprine species.	Remove from source, oil, charcoal, fluids, vitamin E, and a cathartic.

[1]Is also considered to affect the dermal and cardiovascular systems.
[2]Is also considered to affect the cardiovascular system.

Table 7. Toxic plants that affect the neurological system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Jimsonweed *Datura* species	Bovine Equine Ovine Porcine	Aimless wandering, and death.	Alkaloids	When grazed fresh and dried in hay.	0.06 to 0.09% BW.	Treatment is rarely possible. Remove from source.
Locoweed *Astragalus* or *Oxytropis* species	Bovine Equine Ovine	Tremors, blindness, inability to eat or drink, and death.	Swainsoine	When grazed fresh. Not commonly found in baled hay.	30% BW for 6 to 8 weeks.	Remove from source.
Lupine *Lupinus* species	Ovine	Open mouth breathing, increased respiration, and death.	Lupinine	When grazed fresh. Not commonly found in baled hay.	Unknown	Treatment is rarely possible. Remove from source.
Poison Hemlocks *Conium maculatum*	Bovine Equine	Salivation, excitement, and death.	Alkaloids	When grazed fresh and dried in hay.	0.25% BW in equine and 0.5% BW in bovine.	Treatment is rarely possible. Remove from source.
Waterhemlock *Cicuta maculate*	Equine Porcine	Tremors, violent convulsions, and death.	Cicutoxin	Ingestion of roots.	0.3% BW in porcine.	Treatment is rarely possible. Remove from source.

Table 8. Toxic plants that cause physical trauma in livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Foxtail seed heads *Seteria* species, ticklegrass *Agrostis hyemalis*, sandbur burs *Cenchrus* species.	Equine	Blisters or ulcer on the lips and mouth, weight loss, and GI tract damage.	None	When grazed fresh and dried in hay.	Unknown	Remove from source, supportive care for blisters or ulcers.

Table 9. The toxic plant that affects the renal system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Oak buds and acorns *Quercus* species	Bovine Equine Ovine	Abdominal pain, constipation, thirst, and anorexia.	Tannins and Gallotannins	When ingested.	Unknown	Remove from source, provide supplemental feed, fluids, and calcium hydroxide to prevent tannin absorption.

Table 10. Toxic plants that affect the reproductive system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Locoweed and Poison Hemlock	Bovine Porcine	Teratogenesis	Coniine (Poison Hemlock). Unknown (Locoweed).	When grazed fresh. Unknown in baled hay.	Unknown	Treatment is rarely possible.
Western Yellow Pine *Pinus ponderosa*	Bovine	Abortion, weak, and stillborn calves.	Isocupressic acid	When grazed fresh. Not commonly found in baled hay.	Unknown	Remove from source. Use caution when bred cattle and calves are present.

Table 11. Toxic plants that affect the respiratory system of livestock.

Plant Species	Affected Livestock	Symptoms and Syndromes	Toxin	When Toxic	Toxic Dose	Treatment or Supportive Care
Cherry species *Prunus* species	Bovine Equine Ovine Caprine Porcine	Animals commonly found dead.	Cyanide	When leaves and bark are ingested.	Unknown	Remove from source. Sodium nitrite and sodium thiosulfate as needed.
Common lambsquarter *Chenopodium album*, Redroot pigweed *Amaranthus retroflexus*, Curly Dock *Rumex crispus*, and Sorghum-sudangrasses *Sorghum* species[1]	Bovine Ovine Caprine	Sudden death and abortion.	Nitrate	When grazed fresh and dried in hay.	Forage containing greater than 0.2% nitrate	Remove from source. Test suspected forage prior to harvest.

[1] Classified as nitrate-accumulating plants

Literature Cited

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