

Poisonous Plants to Livestock

Factors contributing to plant poisoning are starvation, accidental eating and browsing habits of animals. Starvation is the most common reason. Most woodland or swampy-ground pastures contain many species of poisonous plants. These are usually eaten only when animals have nothing else to eat.

Animals accidentally eat certain plants as they graze. A notable example of this is water hemlock. This plant emerges in wet areas, which are the first to become green in early spring. Animals eager to eat the fresh young grass may accidentally bite off the crown of this plant with fatal results. Another type of accidental poisoning occurs when large amounts of cockle are present in wheat, which is fed as grain.

Some animals on good feed in a dry lot or excellent pasture become bored with the same regular diet. They may eat unpalatable weeds or ornamental plants growing along fences. Goats and cattle like to vary the best kind of diet with a little "browse." Many ornamental or wild shrubs may be consumed, not because they are palatable but because the animal craves variation in its diet.

The severity of poisoning is related to the quantity of material eaten, the specie of animal eating the plant, portion of the plant and condition of the plant eaten, level of ground moisture, general health of the animal prior to ingesting the substance and the age and size of the animal. Therefore some livestock can eat some of the bad plants and under several of the mentioned conditions, fail to show symptoms of injury or poisoning. At other times death may occur.

Scores of plants contain material toxic to animals if eaten in sufficient quantity. Some of the plants are well known, some quite rare, some are useful, others are valued ornamentals. They may be grouped by the type of poison contained, the effect of their toxins or the part of the plant containing the poison. Some plants may contain several poisonous principles.

Cyanogenetic Plants (glucosides, glycosides)

These contain under certain conditions, prussic acid (hydrocyanic acid), a deadly poison that interferes with the oxygen-carrying ability of the blood. Death in these cases is usually rapid and with little outward symptoms. Members of the prunus family of plants, especially wild cherries, are dangerous. **Peaches, plums, wild cherry, and other stone fruits** belong to this group of plants. Wilting of the green leaves caused by frost, storm damage, or by cutting, changes a glucoside (glycoside) found in the leaves to hydrocyanic acid (HCN) and sugar. The sweet, wilted leaves are thus more attractive to animals than normal foliage. Hydrocyanic acid content varies widely, but under some conditions a few handfuls of leaves may be enough to kill a horse or cow. *This type of poisoning should be suspected when sudden death of animals follows windstorms or early sharp frosts. These leaves apparently lose their poison after they have become dry; the limp, green or partially yellowed leaves are the most dangerous.*

These trees do not have to be directly growing in the paddocks where the animals graze. Small branches and leaves broken off and blown by winds during a tornado, a hurricane or a strong storm can land in a pasture, wilt and become very dangerous to livestock ingesting them.

Sudan grass and sorghums are also cyanogenetic plants. These plants are usually deadly when damaged or frozen. Aftermath sprouts following an early frost are particularly dangerous. Very little sudan grass poisoning occurs from animals trampling down plants and later eating them although this is often listed as dangerous. In dry weather, sudan grass is often pastured to the ground without ill effects. After sudan grass has been repeatedly frozen and the plants are completely dead, it is safe but not very valuable for pasture.

Once frozen, sorghum, sorghum sudan hybrids, or their aftermath should never be pastured. As long as the plants show any green color they may be very poisonous. Both frosted sorghum and sudan grass can be best and most safely utilized by ensiling them for at least two weeks before feeding. Normal ensilage fermentation safely eliminates the poisonous principle.

Common milkweed, a perennial that grows three or four feet high, has a heavy stem and leaves and is frequently found in pastures. The milky white sap is sticky and has a bitter taste but livestock eat the topmost, tender leaves if good forage isn't abundant. Remove plants by spading, pulling, cutting or plowing extensive areas and planting to cultivated crops for a year or two.

Horse nettle is a perennial plant, two-feet-high, with spiny stems and leaves, and smooth, orange-yellow berries. Fruits are more toxic than the foliage. It's a common plant in grasslands and fields and is a member of the nightshade family.

Black nightshade is an annual plant, two-feet high, with many branches. Leaves are variably smooth or hairy. The stems are angled in cross-section and sometimes spiny. Clusters of white flowers, one-fourth inch across, bloom in midsummer and are followed by small, black fruits. Both the foliage and green berries are toxic. The ripe berries are not poisonous. Black nightshade is widely distributed.

Mountain laurels and rhododendrons are evergreen shrubs of the Appalachian Mountain region. Plants grow five-feet tall and have glossy green leaves. Flowers appear in clusters at the ends of branches. Livestock eat the leaves in early spring when little other foliage is available. **Piedmont Azaleas** are deciduous plants of the Piedmont. Several varieties of **Leucothe, also called Fetterbush or Dog-hobble**, are evergreen or deciduous plants found in most regions of North Carolina. Weakness, nausea, salivation and vomiting are symptoms of poisoning. The preventative is to keep livestock out of areas where these plants are abundant.

Plants Containing Deadly Alkaloids

Fortunately these plants are unpalatable for most wild and domestic animals. **Water hemlock and poison hemlock** are deadly. Poisoning rarely occurs except in early spring when young plants are accidentally eaten, but the roots, stems, leaves and flowers are always poisonous. Look for and learn to identify these plants in the summer when they are large and showy. The hemlocks are members of the carrot family and have showy, white, umbrella-like flower heads. The roots are the most poisonous parts of the plants. Cut the thick rootstocks lengthwise and you'll find air cavities separated by plate-like partitions of solid tissue. Drops of yellowish, aromatic, resin-like exudates containing the poisonous alkaloid appear at the cuts. Leaves and seeds contain little of the toxic substance and eaten in small quantities, either green or in hay, do little harm.

Poison hemlock needs dry land to grow and is often found in gardens as an ornamental plant. Flowers are often incorporated into large mixed flower sprays in rural churches and at social events.

Water hemlock - a perennial frequently found in wet, fertile soil - is a five-foot-tall plant with thick rootstocks, doubly compound leaves (fernlike) and small white flowers in umbrella-like clusters.

Water hemlock starts growth in early spring. Its green foliage may show up before most other plants leaf out. Livestock tug at the tender leaves and pull roots from the soil which are still soft from late winter rains. The combinations of foliage and roots in considerable quantity can be fatal. As a preventative, pull water hemlock plants from the soil during the summer when they can readily be found and destroy them. Plants usually are not numerous in an area.

Poison hemlock is a hollow-stemmed biennial, four-feet high, with double compound leaves resembling parsley and a large, white taproot like parsnip. Flowers are showy, umbrella-like clusters and appear in late summer. The poison is a volatile alkaloid, coniine, found in the foliage all season and in the seeds in late summer. Most livestock poisoning comes in the spring from eating fresh foliage.

Mayapple, bloodroot, pokeweed, nightshade and hellebore are other alkaloid-containing plants. They are rarely eaten except when animals are starving for better feed. Deaths from alkaloid-containing plants usually result from severe digestive disturbances, pain and nervous symptoms. Animals usually die in convulsions.

Plants That Are Photodynamic

This means photo-sensitive animals get a reaction. Conditions necessary for a reaction to occur are: 1) the animals must have white areas of skin (unpigmented); 2) the animals must eat a sufficient quantity of the plants; and 3) the animals must be exposed to bright sun. In typical cases, an animal suddenly becomes sore on the white areas of their bodies. Whole areas of white skin may raise up and slough off. White goats may become severely affected and die from this condition.

Some common plants, which cause photosensitization, are **rape, alsike clover, buckwheat, lantana, St. John's wort, and ornamental hypericums**. Both St. John's wort and ornamental hypericums have showy, golden-yellow flowers. Animals do not readily eat them. White goats frequently become badly "sunburned" when they are on rape pasture in bright, sunny weather with little or no shade. Alsike clover or other legumes may produce these symptoms in dairy goats under the above conditions

Plants That Produce Mechanical Injury

A number of plants may have a spiny covering, long beards, fine hairs and when eaten may cause mechanical injuries or form hairballs in the stomach and intestines. Sand bur, downy brome grass, squirrel-tail grass, poverty grass, mesquite, and cocklebur are some of the offending plants.

Other Poisonous Plants

Comparatively few plants containing poisons grow in areas usually used as pastures.

Bracken fern is very common in wooded areas and unimproved pastures. Most animals will not eat bracken fern if there is adequate pasture or other feed. In ruminants, such as goats, bracken fern must be consumed over a period of several weeks before toxicity signs develop. Affected animals are listless, show weight loss and may exhibit small hemorrhages on the mucous membranes. They may die from internal hemorrhages.

Buttercups contain an acrid, volatile alkaloid-amenenol, strong enough to blister the skin and cause inflammation of the intestinal tract. Cattle and goats poisoned by buttercups produce bitter milk and a reddish color. The toxic material volatilizes and is lost when buttercups are dried as in hay. A heavy growth of buttercup is an indication of low soil fertility. Have the soil analyzed and apply

ground lime and fertilizers as their need is shown. The increased grass growth soon crowds out buttercups.

Poison ivy is widespread over most of the United States. It's a shrub or vine with woody stems that climb by attaching aerial rootlets to fences, walls, trees, etc. Leaves have three leaflets, glossy green and smooth at the edges. **Inflammation of the skin from contact with the plants is an affliction of goat keepers more frequently than of goats.** The infection can become serious and may need medical attention.

Several ornamental plants that are green outdoors or indoors are highly toxic. Goats should not be fed clippings from ornamental plants. Common poisonous ornamentals are **yew, delphinium, oleander, larkspur and lily-of-the-valley**. Goats should not be allowed access to these plants.

Summary

Cyanogenetic Plants (Glucosides - Glycosides)

Arrow grass, Black Locust, Blue Cohosh, Broomcarn, Buckeye (Horse chestnut), Cherry, Choke Cherry, Corn Cockle, Dogbane, Elderberry, Hemp, Horse Nettle, Indian Hemp, Ivy, Johnsongrass, Kafir, Laurel, Leucothoe, Lily of the Valley, Maleberry, Marijuana, Milkweeds, Milo, Nightshade, Oleander, Rhododendron, Sevenbark, Silver, Sneezewood, Sorghum, Stagger brush, Sudan grass, Velvet grass, White snakeroot, Wild Black Cherry, Wild Hydrangea.

Alkaloid Containing Plants

Aconite, Allspice, Black Snake Root, Bloodroot, Blue Cohosh, Boxwood, Celandine, Common Poppy, Crotalaria, Crow Poison, Death Camas, Dicentra, False Hellebore, False Jessamine, Fume wort, Hellebore, Hemp, Horse Nettle, Indian Hemp, Indian poke, Jimson weed, Larkspur, Lobelia, Lupines, Marijuana, Monkshood, Moonseed, Night shade, Pink Death, Camas, Poison Darnel, Poison Hemlock, Rattleweed, Rock Poppy, Spider Lily, Spotted cowbane, Spotted Water Hemlock, Stagger grass, Staggerweed, Sweet Shrub, Thorn Apple, Varelbells, Wild Parsnip, Wolfs-bane, Yellow Jessamine.

Volatile or Essential Oils as Poisonous Principle

Baneberry, Buttercups, Crowfoot, Ground Ivy, Lobelia, Snakeberry, Spurge, White Cohish.

Saponin-Containing Plants

Bagpod, Coffee weed, Purple sesban, Rattlebox, Soapwort.

Photosensitizing Plants

Buckwheat, Goat weed, Klamath weed, Lantana, Rape, St. John's Wort.

Plants That Cause Mechanical Injury

Cocklebur, Downy Brome grass, Sand Bur, Squirrel tail grass.

Tannin (Tannic Acid) as Poisonous Principle

Oaks, Black locust.

Poisonous Principle Not Exactly Known

Inkberry, Poke weed.

Resources

Plants Poisonous to Livestock and Pets in North Carolina, Bulletin No. 414 (revised), by James W. Hardin and Cecil F. Brownie.

Cornell University Poisonous Plants Informational Database

The author modified and updated a publication from D. L. Ace and L. J. Hutchinson, Pennsylvania State University, University Park; and G. F. W. Haenlein, University of Delaware, Newark.

Author:

JM Luginbuhl

Extension Specialist (Goats & Forage Systems)
Crop Science

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Publication date: Oct. 9, 2015

<http://content.ces.ncsu.edu/poisonous-plants-to-livestock/>

Cornell University Toxic Plants and the Common Caprine



Unlike the public's vision of a goat, the cast iron-stomached beast that can eat everything from a tin can to plastic wrapping, there are many things that can kill a goat. Some poison plants are ingested by accident, while browsing, but a major reason for the toxic poisoning of goats comes as a result of starvation.

As with all nutritional toxicology, it is the size of the dose, and the poison present in the plant that will determine whether the animal lives or dies. This web page is devoted to the caprine species, and to many of the plants out there that can kill them. It gives a fairly comprehensive list of plants commonly found in areas with goats, but it is not complete.

This list comes from an old Dairy Goat Management book that I had kicking around at home, and may be incomplete. For a more comprehensive, and more scientific list, consult Mary Smith, and David Sherman's *Goat Medicine*.

[\[Alkaloids\]](#)[\[Cyanogenic\]](#)[\[Photosensitizing\]](#)[\[Saponins\]](#)[\[Tannins\]](#)[\[All Others\]](#)

Click on the following link for further information on the [plants listed below](#)

Alkaloid Containing Plants:

- Aconite
- Allspice
- Black Snake Root
- Bloodroot
- Blue Cohosh
- Boxwood
- Celandine
- Common Poppy
- Croton
- Crow Poison
- Death Camas
- Dicentra
- False Hellebore
- False Jessamine
- Fume Wort
- Hellebore
- Hemp
- Horse Nettle
- Indian Hemp
- Indian Poke
- Jimson Weed
- Larkspur
- Lobelia

- Lupines
- Marijuana
- Monkshood
- Moonseed
- Nightshade
- Pink Death Camas
- Poison Darnel
- Poison Hemlock
- Poison Rye Grass
- Rattleweed
- Rock Poppy
- Senecio
- Spider Lily
- Spotted Cowbane
- Spotted Water Hemlock
- Stagger Grass
- Staggerweed
- Sweet Shrub

- Thorn Apple
- Virebellis
- Wild Parsnip
- Wolfs-Bane
- Yellow Jessamine

Cyanogenics (plus a few that aren't...):

Cyanogens are glycosides that contain both a sugar, and a cyanide-containing aglycone. They can be hydrolyzed by enzymatic action releasing HCN(Hydrogen cyanide), which is a very potent toxin. This in turn inhibits the terminal respiratory enzyme, cytochrome oxidase.

- Arrow Grass
- Black Locust
- Blue Cohosh
- Broomcorn
- Buckeye
- Cherry
- Choke Cherry
- Corn Cockle
- Dogbane
- Elderberry
- Hemp
- Horse Nettle
- Indian Hemp
- Ivy
- Johnson Grass
- Kafir
- Laurel
- Leucothoe

- Lily of the Valley
- Maleberry
- Marijuana
- Milkweed
- Milo
- Nightshade
- Oleander
- Rhododendron
- Sevenbark
- Silver
- Sneezewood
- Sorghum
- Stagger Brush
- Sudan Grass
- Velvet Grass
- White Snakeroot
- Wild Black Cherry
- Wild Hydrangea

Photosensitizing:

Photosensitivity describes an abnormal sensitivity to light, and may result as an inability of cells to repair themselves when exposed to UV light. Complications may result in production of metabolites throughout the body.

- Buckwheat
- Goat Weed
- Klamath Weed

- Lantana
- Rape
- St. John's Wort

Saponins:

Saponins are naturally occurring glycosides whose active portions are soluble in water and produce foam (reducing the surface tension of water). The name comes from Saponaria, soapwort, the root of which has been used as a soap (Latin sapo, soap). The chemical composition of some saponins is very similar to that of hormones, their aglycones being choline steroids. Some saponins contain a triterpenoid aglycone. Their structure is very similar to that of cardiac glycosides. Bitter taste (triterpenoid aglycones contain glucuronic acid in place of sugar and are detectable by sweet taste: liquorice). Saponins cause growth depression in poultry and swine; bloat in ruminants. Aglycones increasing the permeability of membranes can cause haemolysis by destroying the membranes of red blood-cells, thus releasing hemoglobin. This hemolytic activity of saponins varies considerably from plant to plant. Protoplasts are also affected. Cholesterin inactivates saponosides in humans, only our mucus membranes are badly affected. Used in sneezing powder and as an emetic -> irritate the membranes of respiratory and digestive tracts, this local irritant effect is helpful in pectoral syrups and tisanes to facilitate expectoration. Many plants containing saponosides are diuretic. In humans, the effect disappears within a week following the neutralizing action of cholesterin. Some saponins (e.g. those in oats and spinach) increase and accelerate the body's ability to absorb some active compounds e.g. calcium and silicon assisting in digestion.

- Bagpod
- Coffee Weed
- Purple Sesban

- Rattlebox
- Soapwort

Tannins:

- Oaks

All Other Toxic Plants:

These plants all have different properties that make them toxic in their own way. They may not even kill the goats, but they cause mechanical injury or problems with resins. So for all others, here is the list:

- Clover
 - Cocklebur
 - Downy Broome Grass
 - Sand Bur
 - Squirrel Tail Grass
 - Inkberry
 - Poke Weed
 - Pine Trees
 - Ponderosa Pine Needles
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- Baneberry
 - Buttercups
 - Crowfoot
 - Ground Ivy
 - Lobelia
 - Snakeberry
 - Spurge
 - White Cohosh

This web page was created by an undergraduate student at Cornell University for the AS625 class.

<http://poisonousplants.ansci.cornell.edu/goatlist.html>