

**Reptiles:** more sensitive to Cyanide

**Horse:** more sensitive to Ionophore, Sorghum, centaurea, Sulfadiazine

**Cattle:** more sensitive to Oak, Ponderosa pine, Cyanide, but resistance to centaurea

**Sheep:** more sensitive to Halogeton and Lupine, but resistance to Salt

**Goat:** more resistance to Tannins (Oak)

**Pig:** more sensitive to salt

-CNS signs: Lead, urea, Chlorinated (**bad LUC**)

- **Cardiomyopathy:** Gossypol, Ionophore, Lymph sarcoma and Vit. E and Selenium deficiency,

- **Myocardial fibrosis:** Copper deficiency, cassia poisoning (coffee senna)

- **Diazepam: Rx**

Organophosphate (OPP), Carbamate toxicity, Chocolate toxicity

**P 51- LD50:** the dose that is lethal to 50% of a test group. Lower LD50 is more toxic than a higher LD50

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**P 3, 35, 70, 93 - Organophosphate toxicity (BCSE):**

Same clinical signs as **carbamate**. Remember **SLUDGE**: salivation, lacrimation, urination, defecation, dyspnea and emesis. **Treatment** include emesis, activated charcoal, **seizure control (diazepam, phenobarbital or pentobarbital)**, **pralidoxime chloride** (2-PAM) and **atropine**

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- **Carbamates {insecticides} (BCSE):** clinical signs as they **inhibit the acetylcholinesterase** at nerve synapses and neuromuscular junction. **SLUD**: Salivation, Lacrimation, Urination and Defecation.

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- **Permethrin /pyrethroid toxicity:** found in some brands of

topical flea treatments for dogs, **but highly toxic to cats.**  
Rx with **Methocarbamol**

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**P 120- Methylxanthine alkaloids/ Chocolate toxicity (BCSE):** such as theobromine, theophylline and caffeine.  
**Present in chocolate!** After Valentine's Day or Halloween. See **excitement, seizures and arrhythmias.** Rx. **Diazepam** and **Lidocaine drip**

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**P 146- Urea toxicity/ Non –protein nitrogen (NPN) / ammoniated feed toxicity:** **Bovine bonkers** causes wildly **aberrant behavior, CNS** (tremors) and acute death. Rx. Rumen infusion with **gallon cold water** and **VINEGAR** (acetic acid) to decrease rumen PH which slows absorption of unionized ammonia

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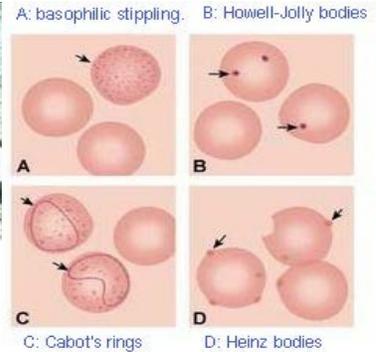
**P 5, 22- Quercus spp (oak) toxicity:**

**Tannins (gallotannin)** and **phenols** are the toxic agents.  
**HEPATO AND RENAL TOXICITY** (**pale swollen kidneys and peri-renal edema**). **Goats** are more **resistant**, but **Cattle** are **most commonly affected.** **If Cows ingesting oak during months 3-7 of gestation** may deliver calves with **congenital abnormalities, "acorn calf."** Characteristics of an acorn calf are short legs, abnormal hooves, a short nose, and a long narrow head. **Oak is lethal to young calves.** Happens consumption of **large amounts** of buds, leaves or acorns **over 2-3 days.** **Prevent consumption** of plants by providing adequate feed especially during Spring *Quercus* and times of drought in areas where oak trees are prevalent.

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**P 9, 126- Halogeton spp and Rumex sp (dock)/Oxalate toxicosis:** leads to **oxalate calculi** in small ruminants and cattle. **Sheep is most affected.** Oxalate toxicity found in ***Sarcobatus vermiculatus* (greasewood), Oxalis (sorrel),**

*Rumex* (**dock**),  
*Halogeton*, **sugar  
beet**, *Amaranthus*  
(**pig weed**) and  
*Chenopodium*  
(**lambsquarter**). It



is also produced by **Aspergillus Niger** in molds. **Oxalate binds to calcium** in the **rumen** or in the body fluids, leading to death attributed to **hypocalcemia** or kidney failure by **calcium oxalate crystals** in the renal tubules.

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**Two toxic agent cause hemorrhagic diarrhea (Arsenic, Lead)**

**P 14, 68, 80, 10 -Aresenic toxicity:** severe GI signs, including **a hemorrhagic diarrhea**. **Cattle** are exposed to arsenic by pesticide-contaminated foliage. **Pets** find arsenic in ant baits and in pressure-treated wood (like on backyard decks) or wood preservative.

**Rx. Dimercaprol** (BAL) deep IM, or **Succimer**. **If signs worsen with 2 hours** give (IV sodium thiosulfate, IV fluid to prevent dehydration and maintain renal function)

**-Lead toxicity:** due to paint of old house, lead curtain, stained glass and lead solder. **Diarrhea** or **constipation**. **CNS signs** (encephalopathy, blindness, and head pressing). **Blood work shows basophilic stippling** (punctate basophilia, is the presence of numerous basophilic granules that are dispersed through the cytoplasm of erythrocyte in a peripheral blood smear). **Rx.** By **Ca-EDTA to chelate lead**.

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### **Caged birds toxicities**

**P 167- Zinc toxicity:** Common in **birds** by clvanized cage wire or other **shiny metal** to prevent rusting. In **dog** by ingestion **pennies**, batteries, paint. **X ray in P 167**

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**P 60- Zinc deficiency:** in **pig** called **parakeratosis non-**

**pruritic.** Rx by add zinc in diet. **Resemble** exudative dermatitis (**greasy pig disease** – Staphylococcus hyicus). However, exudative dermatitis is in young **suckling piglets**, and **treated** by antibiotics

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**P 110- White Muscle Disease (BCSE):** **sudden death** and **endocardial plaques** in young calf, lamb or kid with history of recent vigorous exercise. To try to prevent it, **treat** animals with **vitamin E and Selenium.**



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- **Iron poisoning** is specific problem in **new born piglets** due to over dose by iron injection

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### **P 3, 29, 45, 160- Copper Deficiency:**

Copper deficiency, which presents with **ADR Ain't Doin' Right signs: ACHROMOTRICHIA** (depigmented hair, especially around eyes = **"SPECTACLES"**) rough coat, decreased milk yield, lameness and decreased fertility, libido and **gastroenteritis "Peat Scours/Teart"** (**severe scours with gas bubbles**) and **myocardial fibrosis.** Rx both with **Cu** injections and supplement diet. **If molybdenum content of forage over 5 ppm, can use 1% copper sulfate (CuSO4-SH20)** in salt to get Cu levels back up.

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### **P 88, 97- Molybdenum toxicosis/ secondary hypocuprosis secondary deficiency in copper:**

It is **not common in cattle.** Presents as **"enzootic ataxia"** or **"swayback"** in lambs less than one month old-ataxia and stiffness of the hind end. Rx is **copper sulfate** and removal of molybdenum if possible. Prevent with **copper: molybdenum ratio of 6:1.**

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-**Copper toxicity: On Necropsy** find **gun-Metal grey Kidneys, port- Wine colored urine**

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**-Cyanide toxicity (BCSE):**

**1- Seeds** of apples, apricots, **cherries**, peaches, plums, the **jet berry bush**, **Sorghum** (Johnson grass) and **برقوق Prunus species** (fruit tree) **contain cyanogenic glycosides**.

**Ruminants and reptiles are more sensitive.** **Clinical signs** include **excitement**, rapid respiration, dyspnea, salivation, muscle fasciculation, spasms, **staggering**, collapse and death.

**Key finding** include **bright red blood (cherry color)**, **bright red mucous membranes** and **rumen gas smelling like bitter almond**. **Treatment** include **Sodium nitrite** and **Sodium Thiosulfate**

**2- Sorghum** (Sudan Grass, Johnson grass, Milo) (**BCSE**): can cause **neurologic** toxicity, **primarily in horses**. **Clinical signs CNS** include: **posterior incoordination** (swaying rear limb gait, knuckling) and **urinary incontinence (dripping)**, **secondary to** a lower motor neuron myelomalacia of the nerve roots. It can also cause cyanide toxicity.

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**-Toad poisoning:** cause oral irritant, profuse salivation, **pawing at the mouth**, and **head shaking**

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**-raising and grapes:** **cause anuric renal failure (Anuria**, sometimes called anuresis, is no passage of urine, in practice is defined as passage of less than 100 milliliters of urine in a day. **Anuria** is often caused by **failure** in the function of **kidneys**. It may also occur because of some severe obstruction like **kidney** stones or tumours)

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**- Rotten salmon:** (GI upset) with salmon poisoning, a **systemic** infectious disease of dogs that usually **occurs 5-7 days after eating** infected fish.

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**P 51- Cantharidin toxicity:** from **blister beetle (epicauta spp.)** that swarm (proliferiate) in **alfafa hay**. Cantharidin is a potent irritant **causing** colic, renal disease, hematuria,

**hemorrhagic gastritis**, dark injected mucous membranes and **preacute death**

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**P 24, 26, 108, 140, 165- Ionophore (Monensin, Lasalocid) toxicity:** Heart is the most affected Organs

**In horse:** is the most sensitive. **Rhabdomyolysis** and **cardiomyopathy**. Pale myocardium, hemopericardium, epicardial hemorrhages. Increase **CK (creatine kinase)** due to **Muscle damage**.

In **HORSES** look for HISTORY OF **EATING CATTLE FEED**. See anorexia, colic, stiffness "**tying up**", tachycardia, posterior paresis, high creatine kinase (skeletal muscle necrosis). Then see cardiomyopathy, **HEART FAILURE**

***Rhabdomyolysis** is a serious syndrome due to a direct or indirect muscle injury. It results from the death of muscle fibers and release of their contents into the bloodstream. This can lead to serious complications such as renal (kidney) failure. This means the kidneys cannot remove waste and concentrated urine*

**In cattle** find **Ascites, hydrothorax, pulmonary edema**

Feed concentrations as low as of 100 g/ton and 400 g/ton have been fatal to sheep and cattle, respectively

**Rx.** **No antidote that reverse signs**, slow absorption with charcoal or mineral oil

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**P 38, 124-Bracken fern toxicity /Enzootic hematuria:** ***Pteridium aquilinum***, It Contains **thiaminase**, which **cleaves vitamin B1** and **Ptaquiloside** that is **carcinogenic** and leads to **bone marrow suppression**. Thiamine (B1) deficiency leads to **polioencephalomalacia**

Thiamine (B1) deficiency leads to **polioencephalomalacia**. **Clinical signs** in large animals include **incoordination**, standing with legs apart, depression, muscle tremors, ataxia, blindness, retinal degeneration and **staggers** in horses

**Cattle:** **hematuria**, and aplastic anemia. . **Ptaquiloside** in ruminants leads to **bone marrow destruction**, hemorrhage, anemia, **enzootichematuria** and **tumors in the bladder**

**Horse:** Associated with thiamine deficiency cause **neurological disease**

**Treatment** include discontinue exposure, **thiamine** supplementation and **blood transfusion**.

Bracken fern (*Pteridium aquilinum*) with inset



Bracken fern, growing from large dense woody rhizomes, forms deciduous, stipitate, erect to spreading fronds with nonanastomosing veins. The pinnae are stalked, opposite or subopposite (inset).  
Courtesy of Dr. Bryan Stegmeier.

*Pteridium aquilinum* (bracken fern)



*Pteridium aquilinum* (bracken fern).  
Courtesy of Dr. Lynn Jones.

**P 31,  
40, 173-**



**Acetaminophen or Tylenol Toxicity/Onion or garlic toxicosis:**

**Cats fed an exclusive diet of baby foods:** cyanosis, brown blood, and **Methemoglobinuria** (dark brown urine), Oxidative

damage to RBCs causes **Heinz body** anemia, hemolysis. More frequent **in cat because** it **lack glucuronyl transferase** so can't metabolize NSAID as aspirin, acetaminophen and Ibuprofen.

**Rx.**

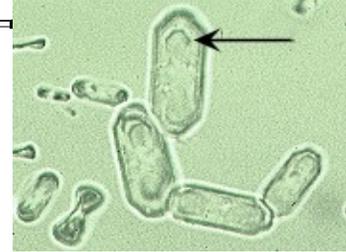
1-**vomating** by **Apomorphine** IV, IM, or under conjunctiva/**xylazine or dexmedetomidine** and **gastric lavage (activated charcoal) with 4 hours Ascorbic acids**, and **Cimetidine for dogs only!** Most common cat toxicity 2-**N-acetylcysteine** which provides a **sulfhydryl** source to

hepatocytes and erythrocytes, thus decreasing oxidative damage from the acetaminophen.

3-Monitoring methemoglobinemia Q (every) 2-3 hours and liver enzyme Q 12 hours

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**P-140, 148, 160- Ethylene glycol (BCSE):** present in **antifreeze**.



**Stage I** (30min-12h post) – **neurological phase** with knuckling, ataxia, vomiting and drunken behavior. **Stage II** (12-24h post) – **cardiovascular phase** with tachypnea and tachycardia. **Later signs** also include **renal failure** and **elevated osmolar gap** (>20mOsm/kg). **Diagnosis** is done by clinical signs, **rapid test kit and Calcium Oxalate Monohydrate crystals in urine sediment**.

**Rx In dog: Fomepizole (4-methylpyrazole or 4-MP)**. In cats, **fomepizole** can be a **more effective** treatment than **ethanol**, **when** administered at high doses (extra-label) and **within 3 hours** of ingestion of EG. **More than 3 hours**, **Ethanol 20%** is the **treatment of choice** for cats. Both ethanol and fomepizole **inhibiting** alcohol dehydrogenase (ADH). **Window for positive outcome is 8-12 h in dog and less than 2h in cat**



**P 46, 102- Centaurea spp / chewing disease:** (yellow star thistle or Russian **K**napweed) (**BCSE**): causes **nigopallidal encephalomalacia in horses**, which is basically



the liquefactive necrosis of the neurons in the globus pallidus and substantia nigra. **Ruminants are not affected**. Affected **horses** cannot properly chew (chewing disease) and show **involuntary** twitching and curling of lips.

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**P 57- Avocado (*persa Americana*):** toxic (**Persin**) to rabbits, mice and caged birds. **NO ZUKU**

Cause **myocardial necrosis** (in mammals and birds) or **sterile mastitis** (in lactating mammals). **Colic** may also occur in **horses**

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**P 66- Salt toxicosis (BCSE):** **sheep** is most resistant and **pigs** are most sensitive. Most common in swine, cattle and poultry.

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- **Mycotoxinoses: Aflatoxins** cause **hepatic injury and failure in ruminants, swine,** and **horses.**

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**P 75, 171- Ergot intoxication/ Ergotism (BCSE):** ingestion of **alkaloids** in a **parasitic fungus, *Claviceps purpurea*,** which infects small grains and forage. Cause vasoconstriction **with terminal necrosis** of the extremities, **frostbite** (injury caused by freezing) and **gangrene, CNS,** decrease in prolactin lead to **agalactia.**

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**P 91- Fescue mycotoxin: Ergot-like mold (*neotyphodium coenophialum*)** present on tall fescue grass can cause **lameness** and **hyperthermia** in **cattle and horses.** It also causes abdominal fat necrosis (**lipomatosis**) **in adult cattle** and **some deer**

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- **Fusarium spp.**

**P 73, 99- Fumonisin:** a toxin from *Fusarium* spp causes **Equine leukoencephalomalacia, hypertension,** and **porcine pulmonary edema** (PPE). Associated with **moldy corn**

**Zearalenone toxin:** Are the only **primary estrogenic effects present molds** on Corn, Barley and Wheat. It responsible for reproductive dysfunction (**Estrogenism and vulvovaginitis**)

**Deoxynivalenol:** Is **secondary mycotoxin** lead to **decrease feed intake** in **mold corn.**

If animal is infected by Deoxynivalenol, limit exposure to Zearalenone if the animal eat less

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#### **P 84- Trichothecenes:**

Is cytotoxic **mycotoxin associated with many fungi**, cause **Vomiting, Immunosuppression**

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**P 78- Cottonseed Toxicity:** also known as **Gossypol toxicity**. **Iron** helps to **inactivate free gossypol pigment**. Gossypol is **cardiotoxic, cardiac myopathy** for cattle, sheep and pigs

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**P 95- Hypomagnesemia (BCSE):** in cattle is present as **tetany** along with hyperexcitability, ataxia, convulsion and death. **Treatment IV Ca/Mg combo** (like in Milk fever – hypocalcemia).

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**P 175- Slaframine toxicosis/black patch disease.** **Rhizoctonia leguminicola fungus** on **red clover**. Causes **profuse salivation**, oral irritation, retching and sometimes vomiting, primarily in horses and occasionally in cattle.

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**-Chlorinated Hydrocarbons (like lindane, methoxychlor):** present in **insecticides** and cause **CNS depression or stimulation** (convulsive seizures). **NO ZUKU**

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**P-19 Paradichlorobenzene:** organochloride **insecticide** that mainly causes **CNS signs (tremors, salivation, ataxia and seizures)** and is found in **deodorant cakes** in **diaper** buckets, garbage cans and in bathrooms

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**P 104- Anticoagulant rodenticides:** include **warfarin, brodifacoum, bromdialone** and **diphacinone**. They **inhibit vitamin K dependent factors** (II, VII, IX and X). Clinical signs: hemorrhage (usually **hemoabdomen**), pale and dry

mucous membrane, tachycardia and weak pulse. Diagnosis: markedly prolonged prothrombin time (**PT**). **Treat** with **emesis**, activated **charcoal** +/- **sorbitol** and **vitamin K1** for 4 weeks OP.

**Sulfa drugs**: can displace the anticoagulant from plasma binding sites leading to **increased free toxicant and increased toxicosis**

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- **Bromethalin rodenticides**: **inhibit ATP** production in **neurons**, which causes tremors, seizures, hyperexcitability and hyperthermia. **Treatment**: emesis, activated charcoal, **diazepam**, **mannitol** to **reduce cerebral edema** and **incline plane 30 degrees** to **improve venous return**.

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- **Cholecalciferol Rodenticide**: **increases intestinal absorption of calcium** leading to **hypercalcemia**, **hyperphosphatemia** and organ injury. **Clinical signs** usually **take 36 hours and include acute renal failure and cardiac arrhythmias**. **Diagnosis** is presence of **hyperphosphatemia** (12h post ingestion), **hypercalcemia** (24h post ingestion) and **azotemia** (36-48h post). **Treatment**: **emesis**, activated **charcoal**, loop diuretics (**furosemide**) or saline diuresis, **corticosteroids** (decrease Ca intestinal absorption and urinary retention) and biophosphonates (**pamidronate**) to **inhibit osteoclast activity**.

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**P113, 136- Locoweed toxicosis/ High Mountain/Altitude Dz/ Brisket Dz (BCSE):**

Due to **Astragalus and Oxytropis** ingestion leads to

**Swainsonine toxicity/ vetches or milk vetches** and causes **neurological signs** (locoism) such as aggression, ataxia, depression, and **circling** and **vision loss**. **Right Congestive heart failure** (CHF) due to high altitude. **LOCOWEED**



**excreted in milk so calf can infect.** High mountain disease has a genetic component and **prognosis is good if the disease is catch early.**



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**P 117, 151, 156- Photosensitization: Congenital** inherited photosensitization is seen in some breeds of **cattle and sheep**

**Primary photosensitization:** is when the component becomes photo dynamic (Caused by photodynamic substances in plants itself). Plants such as **hypericin** from **hypericum perforatum** (**St. Johns Wort**) and **fagopyrin** from **fagopyrum esculentum** (**buckwheat**). PRIMARY photosensitization occurs in the absence of hepatic disease **when a photodynamic agent is ingested/injected/absorbed.** **Tetracycline** is a medication that can cause primary photosensitization

**Secondary sensitization/ pyrolizidine alkaloid hepatotoxicity:** caused by plant-related hepatic damage. These plants release photodynamic substances like **phylloerythrin** which **breakdown** of product **chlorophyll.** **Failure to excrete phylloerythrin** due to liver dysfunction or bile duct lesions can **lead** to a buildup of **phylloerythrin** in the blood and skin, **where phylloerythrin can absorb and release light energy,** causing **phototoxicity.** Secondary sensitization is more common than primary. **The plants most often implicated include** ragwort (**Senecio jacobea**), woolly groundsel (**Senecio redellii, Senecio longilobus**), rattleweed (**Crotalaria retusa**), and seeds of **yellow tarweed** (**Amsinckia intermedia**). **Pyrrrolizidine alkaloids** are one cause of secondary Photosensitization due to liver damage.

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**Causes of secondary Photosensitization/ Skin's muzzle is sloughed off are:**

- 1- **Pyrolizidine** alkaloid present in **senecio** sp., **Amishinckia intermedia**, *Cynoglossum officinale* and *Crotalaria* spp, which cause **liver Failure**
- 2-plants release **phylloerythrin** which **breakdown chlorophyll**
- 3-bile duct occlusion. 4-Mycotoxic lupinosis. 5-Facial eczema (pithomycotoxicosi)

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**P 130- 4-Ipomeanol toxicity (moldy sweet potato):** clinically indistinguishable from **Acute Bovine Pulmonary Emphysema and Edema** (ABPEE, also known as **Fog Fever**).



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**P 133 - Ponderosa pine (BCSE):** needles and bark contain the **toxin isocupressic acid**, which causes vasoconstriction and ischemia to the uterus and other tissues. Causes **abortion 2-21 days** after ingestion of 5-6 pound per day for 3 days. **Cattle is most sensitive** to it.



See p 133 for more explanation

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**Lupine sp (BCSE):** The most common toxic cause of **arthrogryposis** in the calf or lamb is consumption of toxic alkaloids (**anagyrene**) in *Lupine spp* plants by pregnant dams. **Adults** that eat lupine may display inappetence, dyspnea, convulsions or **death from respiratory paralysis**. **If lupines become infected with a fungus** (*Phomopsis leptostromiformis*), **mycotoxic lupinosis** can cause **hepatic damage**. **It has a teratogenic effect in cattle only, if dam eat**

the plant between 40-70 days of gestation causing newborn calves with **Arthrogryposis (Crooked calf syndrome)** have **ankylosed, rigid limbs, scoliosis, kyphosis, and sometimes a cleft palate.** There is no specific treatment. Most commonly affect sheep



Lupinus sericeus (Lupine)



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**Sago palm:**  
ingestion causes acute **hepatic necrosis** and is lethal.



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**Marijuana:**  
prolonged sedation,  
hypotension,  
bradycardia,  
hypothermia and  
mydriasis.



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**Cardiotoxic plants: Oleander (nerium oleander), Foxglove (digitalis purpurea), Azalea (Rhododendron) and Easter Lily of the valley (Donfallaria majalis).** **Cardiac glycosides** inhibit sodium-potassium ATP pumps in myocardial cells. Effects include **A-V block, increased** vagal tone, **decreased** membrane potential, and **decreased pacemaker activity.** **Foxglove (Digitalis spp.)** extracts are used to make DIGOXIN

to treat cardiac patients. **Serum digoxin** level can **confirm** diagnosis of cardiac glycoside toxicity. **Rx: Early decontamination** (e.g. induce vomiting, administer activated charcoal); **anti -arrhythmics**; **symptomatic treatment for dehydration, electrolyte abnormalities** and **gastrointestinal (GI) upset**. **Prognosis:**  
-Guarded if moderate to severe cardiovascular signs  
-Good if GI upset WITHOUT cardiovascular signs



**Other cardiotoxic plants** (which contain



**GRAYANOTOXIN**) include **rhododendron, azalea, rosebay** and **laurels**. Mechanism of action and **Rx** are similar to that of cardiac glycosides. **Prognosis:** generally good



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**Veratrum spp (false hellebore, skunk cabbage):** associated with **cyclopia**. Ingestion by ewes **on day 14** of



gestation will produce **cyclopean** lambs.

Ingestion on days **19-21** results in **embryonic**

**death**; days **28-32** result in

**defects of the limbs.** Birth defects are most commonly seen in sheep, cattle, goats, llamas, and horses are all susceptible.

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Courtesy of Dr. Lynn James  
Veratrum californicum (False Hellebore)

**Metaldehyde:** occurs 1-3 hours after ingestion of **snail/slug bait**. See severe muscle **tremors**, ataxia, hyperesthesia, anxiety, tachycardia and hyperthermia. Other clinical signs include vomiting, diarrhea, opisthotonus, mydriasis and seizures. Can be rapidly fatal without immediate intervention.

**Treatment** includes **decontamination** (induce emesis, administer activated charcoal), **management** of tremors/seizures and supportive care.

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**Hemlock poison:** in **conium maculatum** and clinical signs include hind limb weakness, weak pulse, irregular heart rate, recumbency, coma and death. **The cow's breath and urine smell like the odor of mouse urine.**

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**Nitrate Toxicity:** present on Pigweed, Nighthshade (solanum), oat hay, Sorghum, Rye and Alfalfa. Primarily problem in cattle.

**Nitrate causes methemoglobinemia**, leading to **dark brown** or **chocolate colored blood**, gray mucous membranes, dyspnea, tremors and convulsion. Treatment: 1% of methylene blue

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**Acer rubrum (red maple) toxicity:** Unknown toxic principle(s) in wilt leaves. Causes **methemoglobinemia**, **heinz body anemia**, and intravascular hemolysis, weakness,

polypnea, tachycardia, depression, icterus, cyanosis, brownish discoloration of blood and urine. Affect horses



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**Ester Lilly or Tiger Lilly:** can cause acute renal failure in cats. Clinical signs include **azotemia**, weakness, ataxia and **abdominal pain**. Lab work shows very high creatinine, hyperkalemia and hyperphosphatemia.

**Mothball toxicity:** caused by **naphthalene**-containing mothballs or from **paradichlorobenzene** containing cakes. Clinical signs include GI signs, hemolytic anemia and Heinz bodies.

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**Stringhalt gait:** caused by *Hypochoeris radicata* (flatweed) and *Lathyrus* (sweet pea).

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**Teratogenic effect:** Griseofluvin (antifungal), Ketoconazole (antifungal) and Doxorubicin (chemotherapeutic) are teratogens, especially for cats and horses. Oak toxicity (acorn calf) and Lupinea (arthrogryposis in calfs) and skunk cabbage (cyclopedia in lambs).

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**Aflotoxicosis:** toxigenic strains of *Aspergillus flavus* and *A parasiticus* on peanuts, soybeans, corn (maize), and other cereal grains. Clinical signs in acute cases include liver damage, widespread hemorrhages, icterus and death. Subacute signs include depression, weakness, anorexia and unthriftiness. Treatment: take animals off feed and provide an effective binder for aflatoxins, such as hydrated sodium calcium aluminosilicates (**HSCAS**).

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**Alkaloids toxicity:** present in Delphinium spp. (larkspur), **Rhododendron** spp (**azaleas**) or Solanum spp. (nightshade). It causes both **cardiac arrhythmias and severe gastric distress.**

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**Alsike clover**  
(*Trifolium hybridum*):  
also known as “dew  
poisoning” causes two  
syndromes in horses:  
photosensitivity  
(trifobiasis) and Alsike  
clover poisoning (“big  
liver disease”). The



The toxic principle is an unidentified phototoxin. Photosensitivity has been reported in horses, sheep, cattle, and pigs. Clinical signs include reddened skin after exposure to sun, followed by dry necrosis of the skin or edema and serous discharge. The muzzle, tongue, and feet are frequently affected. If the stomatitis is severe, anorexia and weight loss develop. If not treated it can be fatal due to hepatic failure and neurologic disturbances. Colic, diarrhea, and other signs of GI disturbances have been noted. Affected horses may be markedly depressed or excited. Diagnosis: serum chemistry alterations include increased GGT and AST activities and hyperbilirubinemia, with direct bilirubin frequently being  $\geq 25\%$  of the total, history and multiple animals on a farm or in an affected area. **NO ZUKU**

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**Black walnut toxicity:** Horses are more susceptible. When used as bad black walnuts can cause acute onset of laminitis, which may progress to necrosis of dorsal laminae, distal limb edema and fever. You can see a picture in the side!

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**Blue-green Algae:** hepatotoxicosis after the ingestion of cyanobacteria.

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**Carbophenothion:** used to control parasites on sheep and a

single dose is lethal to cats. **NO ZUKU**

**Fishmeal:** can be potentially toxic and allergenic. Ethoxyquin is a preservative in fishmeal that may have toxic hepatic effects. Fish meal also contains mercury, which can cause neurological disturbances.

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**Household Cleaners:** acids and alkalis that cause caustic or corrosive lesions respectively. Treatment administer milk or water, GI protectants for several days and monitor for ulcers.  
**Do not induce vomit or administer activated charcoal**

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**Hypothyroidism:** caused by goitrogenic plants (soybeans, cabbage, rape, kale and turnips) that do not allow iodine uptake by the body. Pregnant dams that eat goitrogenic plants may birth foals with hyperplastic goiter and hypothyroidism

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**Kleingrass (*Panicum coloratum*):** produce toxicosis in horses and ruminants. Sapogenin content (toxic principle). Clinical signs include icterus, photosensitivity, intermittent colic and fever, weight loss, and hepatic encephalopathy. Diagnosis: Bilirubin,  $\gamma$ -glutamyl transpeptidase or transferase (GGT), and blood ammonia concentrations are increased, history of exposure to plants and multiple affected animals on a farm or in an area. Affected animals should be removed from the kleingrass source, fed good-quality hay, and protected from sunlight. Local treatment of the photodermatitis with antimicrobial or softening creams may be needed in severe cases. **NO ZUKU**



Kleingrass

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**Imidacloprid:** is a neonicotinoid insecticide that can be applied in dogs and cats. **NO ZUKU**

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**Painting and Varnishing products:** Treatment administer milk or water, GI protectants for several days and monitor for

ulcers. Do not induce vomit or administer activated charcoal.

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**Penitrem A:** present in moldy garbage containing *Aspergillus* spp. Clinical signs include painting, restlessness, hypersalivation, incoordination, fine motor tremors and seizures. Treatment includes gastrointestinal decontamination (emesis if possible), activated charcoal, methocarbamol (robaxin) for muscle tremors, diazepam (for seizures) and GI protectants (sucralfate or H2 blockers).

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