Vet 406: Mycotoxins

Mycotoxin	Produced by	MOA / Target Species	Symptoms / Clinical Signs	Treatment
Aflatoxin	Aspergillus spp. <u>Found</u> Corn cottonseed, peanuts, ground nuts and tree nuts, rice *Storage and field problem	Biotransformation Metabolic activation in the liver, kidney and small intestine Disruption of organ function Primary problem is liver damage (chronic) Affected from most to least: Feeder cattle Dairy cattle Swine Broilers Calves Pigs Milk residues	Hepatic lipidosis and liver necrosis Dogs, poultry, pigs affected Anemia, jaundice, anorexia, GI disturbances, hemorrhage Abnormal coagulation profile Chickens: Reduced weight gain and growth rate, tan-colored appearance of the liver surface Immune functions -Humoral and cell mediated immunity -Reduces resistance to infectious diseases	
Penitrem A	Penicillium spp *Tremorgenic mycotoxin <u>Found</u> Moldy dairy products, moldy walnuts, moldy bread, garbage, compost	Dogs	Acute presentation Restlessness, panting, excessive salivation, vomiting, progressive whole body muscle tremors Advanced presentation: Mimics strychnine poisoning Tremors become more severe, hyperresponsive to external stimuli Seizures, hyperthermia, exhaustion, dehydration	Decontamination Fluids Diazepam, methocarbamol, barbiturates Good prognosis!

Fumonisins	Fusarium verticilloides <u>Found</u> corn	Structurally related to sphingosine Inhibition of key enzymes in the de novo sphingolipid biosynthetic pathway Prevention of sphingomyelin production All species	Horses: CNS Equine leukoencephalomalacia Need to ingest for >21 days *Massive liquefactive necrosis of cerebral white matter Swine: Lungs Porcine pulmonary edema signs within 3 days All species: Liver damage Humans: Esophageal cancer	Remove feed Poor prognosis due to the acute onset and rapid progression
Deoxynivalenol (DON, vomitoxin)	Fusarium spp. *Found* Corn, wheat, barley, cereals	Unknown MOA Swine and dogs are most susceptible Horses and cattle are fairly tolerant	Anorexia	Supportive care Clinical signs subside rapidly after contaminated feed is removed Good prognosis!

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Ergotism and Tall Fescue Toxicosis	Ergot Claviceps purpurea Found Rye, wheat, barley, oat etc. Tall fescue pastures Leaves, stems, seeds	Toxic alkaloids produced by fungi Potent vasoconstriction (D1-receptor inhibition, partial agonism of alpha1-adrenergic and serotonin receptors) Stimulation of D2-dopamine receptors in CNS leads to a decrease in prolactin secretion and agalactia	"Fescue foot" -cattle and sheep -hypothermic conditions -within 1 to several weeks after exposure to ergot alkaloids Gangrenous form of ergotism "Summer slump" -hyperthermia -Cattle and sheep - Immunosuppression -Delayed shedding of the haircoat -Decreased feed intake, weight gain, milk production -Lethargy Equine fescue toxicosis -mares during late gestation and early post-partum period -Dystocia, abortion, retained placenta, increased fetus size at birth, neonatal septicemia, decreased viability	Early recognition is key Prevent further exposure Nutrient supplementation in cattle (minerals) Horses: Administer D2 antagonist