

MOLDY FEED, MYCOTOXINS AND CATTLE PRODUCTION

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Molds growing on feed, particularly grains, may produce toxins hazardous to cattle, and because of residue problems be harmful to young calves or the milk or tissues may be harmful to humans. Acute toxicity may produce hyperexcitability, decreased feed consumption, stunting, liver damage, diarrhea with straining, hemorrhage and increases susceptibility to bacterial, viral or parasitic diseases. Chronic toxicity results in decreased growth rates, liver damage, hemorrhage and even abortions. Such animals, when put on new, well-balanced rations free from aflatoxin, rubratoxin or ochratoxin, will slowly recover. Generally, cattle are more tolerant to aflatoxin B₁ than are other Florida farm animals. The FDA guideline for milk is up to 0.5 ppm.

Molds and Their Toxins Hazardous to Cattle

<u>TOXIN</u>	<u>MOLDS INVOLVED</u>	<u>SYMPTOMS*</u>
B ₁ B ₂ G ₁ G ₂	<u>A. flavus</u> , <u>A. parasiticus</u>	Reduced feed intake, liver damage, jaundice, hemorrhage, diarrhea, prostration, hair color change, death
Ochratoxin	<u>A. ochraceus</u> , <u>P. commune</u>	Liver, kidney damage, depressed appetite, diarrhea, prostration, death
Rubratoxin	<u>P. rubrum</u>	Similar to aflatoxin
Ergotoxin	<u>C. purpurea</u>	Hyperexcitability, blood clots, dry gangrene, loss of tail, ears, hooves
Oxalic acid	<u>A. niger</u> , <u>P. oxalicum</u>	Gastric irritation, hemorrhage, CNS damage, coma, death
Penitrem A	<u>Penicillium</u> sp.	Ryegrass, Bermuda grass, Maize and Paspalum; staggers, muscle tremors, convulsions, mortality
Kojic Acid	<u>A. flavus</u> , <u>A. oryzae</u>	Convulsions, edema, prostration

*Some symptoms observed in field cases are caused by more than one toxin being present.

Factors Influencing Mycotoxin Production (1-6) and Toxicity (7-10).

1. Moisture content
2. Temperature
3. Trace elements, Zinc and Copper
4. Pre-storage and storage problems
5. Drought stress
6. Insect damage
7. Species
8. Age
9. Vitamins
10. Protein Levels

Ergotism or Tremorgens

Claviceps purpurea - ergot on rye, oats, wheat, barley or grasses. C. paspali on Dallis or Argentine bahia grass-brown sclerotea. Warm, moist, humid growing seasons predispose to "ergotism"

Ergotoxins - stimulate smooth muscle; contains lysergic acid causing CNS stimulation. Produces the acute, hyperexcitable form or chronic, gangrenous effects. If animals eat ergot-infected grain and develop nervous excitability, the grain is toxic; the chronic effect is to cause serious circulatory disturbances with obliterative endarteritis and gangrene. There may be sloughing of feet, hooves, tails, ears and tongue. Grain must not contain more than 0.3% for feed usage.

Clinical signs - include hyperexcitability, belligerency, weaving, incoordination, falling with death or recovery in 10-14 days if put on clean feed or pasture.

Treatment - Acepromazine, chlorpromazine or Diazepam.

Fescue foot - a related disease of cattle where one or both hind feet become gangrenous, the tip of the tail or ears may also slough and there may be gangrenous patches of skin above the affected hooves.

Fusarium, sp. - may produce T-2 toxin, diacetoscirpenol, DAS. Swine may refuse to eat the moldy feed, but poultry may consume it. It has produced impaired growth rates, intestinal hemorrhage and death. In humans, the problem is called Alimentary Toxic Aleukia, ATA. F-2 Toxin, or Zearalenone is associated with corn at high moisture levels, i.e., more than 18%. Toxic levels may reach 200 ppm. It produces poor reproductive performance in sows, interfering with normal estrous cycles resulting in a marked decrease in the number and size of pigs farrowed per litter.

Penicillium, sp. - has produced Penitrem A on ryegrass, bermudagrass, and maize resulting in muscle tremors, staggers, convulsions and death.