



Ergot fact sheet

Fungi that grow in grains and forage can produce poisonous “mycotoxins”. These compounds may affect both human and livestock health. Only a small number of mycotoxins are of concern to livestock, even though more than four hundred individual mycotoxins have been identified.

A. What is “ergot”?

1. Complex group of mycotoxins produced by metabolism of *Claviceps purpurea* and related fungi.

- a. Are in class of compounds called “alkaloids”
 - i. Group of naturally occurring chemical compounds that mostly contain basic nitrogen atoms
 - ii. Well-known alkaloids include morphine, strychnine, quinine, ephedrine, and nicotine

2. *C. purpurea* infects nearly all grasses used for hay and haylage

- a. Barley, rye, wheat
 - i. Alkaloids in infected rye grain used for bread
 - ii. Toxicity symptoms may have been source of historical witch hysteria
 - 1) e.g., 1692 Salem (Massachusetts) Witch Trial
- b. Brome, fescue, bluegrass, timothy, Western and intermediate wheatgrass and other grasses
- c. Quackgrass, dallisgrass

B. Advisory levels

1. U.S. Food and Drug Administration (FDA) has not set action, advisory, or guidance levels

- a. May cause poisoning symptoms in cattle: 0.1% to 0.3% contamination

2. Grain may be graded as “ergoty”

- a. Wheat or durum: 0.05% by weight
- b. Barley, oats, triticale: 0.1% by weight
- c. Rye: 0.3% by weight

3. Ergot sclerotia may fragment during harvest or processing

- a. Requires microscopic examination to detect in feeds or grain products

C. Conditions favoring contamination

1. Favored by cool damp conditions at flowering

- a. Fungus infects through the flower
- b. Forms sclerotia called “ergot”
 - i. sclerotia: compact mass of hardened fungal mycelium containing food reserves
 - ii. Is dormant; able to survive for relatively long time



Figure 1. Ergot sclerotia protruding from rye heads. (after Univ. of Nebr. Ext. Pub. EC1880)

2. Only forms in seed head

- a. Forms in original location of seed formation
- b. Similar in shape to the grain (see Figure 1)
- c. Usually slightly to significantly larger
- d. Hard; colored dark purple or black (see Figure 2)



Figure 2. Ergot-contaminated wheat grain (after Univ. of Nebr. Ext. Pub. EC1880)

D. Health effects

1. Called “ergotism”

2. May affect cattle, sheep, swine, horses

- a. Rough hair coat
- b. Staggers
- c. Nervous and motor disorders
- d. Lameness

- e. Insufficient blood flow to the extremities
 - i. Tissue necrosis >> “dry gangrene”
 - ii. May stand in water for extended time
 - iii. May result in loss of ears, tail, feet or hooves
 - 1) Ears and tail affected first

3. Additional effects to swine

- a. Possible infertility
- b. Lactation failure

E. Managing ergot

1. No practical way to eliminate ergot in pasture

- a. Must examine pasture and hay for ergot
- b. Infection depends on climatic conditions
- c. Fescue endophyte toxins similar to ergot toxins

2. Sclerotia only forms in seed head

- a. Graze infected pasture before seed head develops
- b. Clip grass with seed head before grazing

3. Remove access to infected feedstuffs immediately when symptoms are observed

References

Adams, R.S. et.al. *Mold and mycotoxin problems in livestock feeding. DAS 93-21. Pennsylvania State Univ. Coop. Ext. Svc. 17 pg.*
<http://www.das.psu.edu/research-extension/dairy/nutrition/pdf/mold.pdf/view?searchterm=mycotoxin> [accessed 01Nov2009]

Randle, R. and D. Griffin. August 2013. *Ergot Poisoning in Cattle. Univ. of Nebraska Extension.* <http://beef.unl.edu/cattleproduction/ergot-poisoning-in-cattle> [accessed 18Sep2017]

Wegulo, S. and M. Carlson. *Ergot of Small Grain Cereals and Grasses and its Health Effects on Humans and Livestock. Pub. EC1880. Univ. of Nebr. Ext.* <http://extensionpublications.unl.edu/assets/pdf/ec1880.pdf> [accessed 18Sept2017]

Kuldau G.A. (2008). *Managing mycotoxins in Northeast silages.* <http://www.das.psu.edu/dairynutrition/documents/kuldau.pdf> [accessed 18Sep2017]