

Mold Interpretation



Conditions Favoring Mold Production:

Molds grow over a temperature range of 50°F – 104°F and a pH range of 4 – 8. Mold spores are in the soil and in plant debris lying ready to infect the growing plant in the field or during storage.

Mycotoxin Production:

Some molds produce mycotoxins under certain conditions but the presence or absence of mold does not directly indicate the presence or absence of mycotoxins. For example, *Fusarium* molds have been reported to grow prolifically at 77°F - 86°F without producing much mycotoxin, but at near freezing temperatures they produce large quantities of mycotoxins with minimal mold growth (Joffe, 1986). Molds can be detrimental to animal performance regardless of mycotoxin contamination.

Mold Identification:

Mold identification can be used to determine which mycotoxins are likely to be present. See the chart below for information on molds and their associated mycotoxins.

Mold Species - Producing Toxin	Color	Toxin	Conditions favoring production
Aspergillus	Yellow-Green	Aflatoxin Ochratoxin	Heat and drought stress preharvest, heat and humidity postharvest
Fusarium	White to Pinkish-White	Zearalenone T-2 Toxin Vomitoxin(DON) Fumonisin	Grows both pre and postharvest. Excessive moisture during flowering and grain fill of wheat. Cool wet growing season with insect damage. Dry conditions mid-season followed by wet weather. Associated with ear and stalk rot in corn, head scab in small grains, red ear rot, and pink ear rot
Penicillium	Green to Green-Blue	Ochratoxin	Cool, wet, and low pH (acid tolerant) postharvest
Cladosporium	Dark Blue-Green to gray or black	None	Early frost, neutral pH, high grain moisture (30-40%), temperatures at 75-125 ° F .

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cfu/gram (air dried) ^b	Feeding Risk and Cautions ^a
Under 500,000	Relatively low count
500,000 to 1 million	Relatively safe
1 to 2 million	Discount energy (x .95) Feed with caution
2 to 3 million	Closely observe animals and performance Discount energy (x .95)
3 to 5 million	Dilute with other feeds Discount energy (x .95) Observe closely
Over 5 million	Discontinue Feeding

^a Risks refer primarily to effects of mold per se without regard to possible mycotoxin content. Depressed digestibility, feed intakes and performance may occur from a high mold content without mycotoxins present. Harmful mycotoxins may be present even when there is little or no obvious mold content.

^b Mold spore counts sometimes may underestimate degree of mold present, especially in feed that have been ensiled for some weeks. Observe and record relative amounts of mold present.

Sources

Joffe, A.Z. 1986. "Fusarium Species: Their Biology and Toxicology". John Wiley and Sons, Inc. New York

Kurtzman, C.P., B.W. Horn, and C.W. Hesseltine. 1987. *Aspergillus nomius*, a new aflatoxin-producing species related to *Aspergillus flavus* and *Aspergillus tamarii*. *Anton v. Leeuwenhoek* 53:147-158.

Adams, Richard S., Kenneth B. Kephart, Virginia A. Ishler, Lawrence J. Hutchinson, and Gregory W. Roth. "Mold and Mycotoxin Problems in Livestock Feeding." Dairy Cattle Nutrition (Penn State Extension). Penn State Extension, n.d. Web. 17 Sept. 2013.

Hoffman, P., R. Shaver, and P. Esker. 2009. High moisture corn, aerobic stability, feed additives, and mycotoxins: Common questions. The 2009 Wisconsin Corn Corp.

Write, C. B. Holland, R. Daly and L. Osborne. 2009. Moldy corn for beef cattle. SDSU Extension Estra: 2069.

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