

Agri Resource

INTERPRETATION GUIDELINES FOR MOLD AND YEAST COUNTS

Extracted from AgSource Cooperative Services:
<http://agsource.crinet.com/page3189/MoldYeastMycotoxinTesting>

Mold Count	Feed Recommendation	
10 – 10,000	Relatively Safe	
10,000 – 100,000	Transition Zone	
100,000 – 10,000,000	Caution Advised	Dilute with other feeds, discount energy (x .95) closely observe animals performance
Over 10,000,000	Feeding may not be recommended	

Yeast Counts		Results
Less than 1,000,000	OK for hay, dry corns or grain	Smell
Less than 4,000,000 – 5,000,000	OK for corn silage or haylage	Stomach up-set off feed
Less than 20,000,000	OK for HMSC	May be able to neutralize with buffer
Greater than 1,000,000	On fermented feeds may indicate unstable feed	Closely observe animals performance

MOLD IDENTIFICATION

Mold	Color	Toxin Producer	Comments
Penicillium	Blue/Green	Yes	Several potent toxins associated with certain species, most common toxin producer in silage
Aspergillus	Yellow/Green	Yes: Aflatoxin	Found in drought heat stressed conditions or insect infected fields
Fusarium	Red/White/Pink	Yes: Zearalenone, Vomitoxin, T-2 Toxin, Fumonism	Common in cold wet seasons, certain strains produce extremely potent toxins
Mucor	White	No	Found especially in sealed corn
Rhizopus	Black	No	Requires high moisture & an advanced decay mold
Cladosporium	White	No	Symptoms similar to yeast, grows at low temps.

MYCOTOXINS PREDETERMINED DANGEROUS LEVELS

Aflatoxin – 20 ppb (upper limit)

Molds which can produce Aflatoxin:

Aspergillus flavus	Most common
Aspergillus parasiticus	Most common

	Cattle (sc/cs/hay)	Dairy Cows	Swine
Low Level	Less than 5.0 ppb	Less than 20.0 ppb	-----
Moderate-High	5.0 ppb – 10.0 ppb	20.0 ppb – 100.0 ppb	-----
High Level	20.0 ppb or more	100.0 ppb or more	-----

Zearalenone – 6.0 ppm (upper limit)**Molds which can produce zearalenone**

Fusarium graminearum Most common

	Cattle (sc/cs/hay)	Swine (sm grain)
Low Level	Less than 1000 ppb	Greater than 200 ppb or .20 ppm
Moderate - High	1100–5500 ppb or greater than 1.0 ppm	Greater than 450 ppb or .45 ppm
High Level	Greater than 6000 ppb or 6.6 ppm	Greater than 500 ppb or .50 ppm

Vomitoxin – 6.0 ppm (upper limit)**Molds which can produce vomitoxin**

Fusarium species Most common

	Cattle (sc/cs/hay)	Swine (sm grain)
Low Level	Less than 1.0 ppm	Less than 1.0 ppm
Moderate - High	1.1 – 5.9 ppm	Approximately 1.0 ppm
High Level	Greater than 6.0 ppm	Greater than 1.0 ppm
Equine High Level	2 ppm	

T-2 Toxin – 500 ppb (upper limit)**Mold which can produce T-2 toxin**

Fusarium species Most common

	Cattle (sc/cs/hay)	Swine (sm grain)
Low Level	Less than 150 ppb or .15 ppm	-----
Moderate - High	Less than 450 ppb or .45 ppm	-----
High Level	Greater than 500 ppb or .50 ppm	-----

MYCOTOXIN EFFECTS ON LIVESTOCK PERFORMANCE AND HEALTH

The following information is extracted from Penn State Cooperative Extension's document

Mold & Mycotoxin Problems in Livestock Feed, which can be viewed in full at

<http://documents.crinet.com/AgSource-Cooperative-Services/Agronomy-&-Feed/mold.pdf>

AFLATOXIN:**Cattle:**

- Levels in milk above legal maximum of .5 ppb within 4 to 6 days on diets with over 40-50 ppb in TRDM.
- Levels fall in 2 to 4 days on a low aflatoxin diet.
- Reduced growth and feed efficiency in cattle under 300 lb at 150-200 ppb in TRDM.
- Reduced growth, feed efficiency, and liver damage in cattle over 300 lb sometimes at 220 to mostly 400+ ppb in TRDM.
- No effects in dairy cows at 300 – 380 ppb in TRDM.
- Moderate reduction in milk at 600+ ppb in TRDM.
- Pronounced drop in milk (50%) and sharp decrease in feed intake at 2400+ ppb in TRDM.
- Reduction in rumen motility at 400 ppb in TRDM.
- Deaths in young cattle at 600+ ppb in TRDM and in adults at 1000 to mostly 2000+ ppb in TRDM.

Swine:

- Reduced growth and feed efficiency, liver damage in pigs under 117 days at 170-280 ppb in TRDM.
- Liver damage, reduced performance, and some deaths at 400 to mostly 600+ ppb in TRDM.

ZEARALENONE:**Cattle:**

- Enlarged vulva and possible irregular heats and infertility at 4-7 ppm in TRDM.
- No abortions noted in most cases
- No effects on performance at .5 ppm in corn or about .15 ppm in TRDM.

Swine:

- Enlarged vulva, infertility, prolapsed uterus or rectum, enlarged nipples or mammary glands, vulvovaginitis, enlarged prepuce at .8-4 ppm in TRDM.
- Sows may fail to cycle at levels exceeding 3 ppm.
- Sows may resorb their embryos or abort their fetuses at levels exceeding 30 ppm.
- Concentrations as low as 2 ppm reduce testicular growth and total sperm number in boars.
- Levels reach 40 ppm in the feed, testosterone in the blood may drop and prevent the boar from mating successfully.

DON – DEOXYNIVALENOL or VOMITOXIN:**Cattle:**

- Off-fed, ketosis, DAs, pronounced milk decrease, sometimes diarrhea at 1.5 – 2.5 ppm in TRDM or possibly lower.

Swine:

- Feed refusals, reduced growth, weight loss, sometimes diarrhea, starting at .6 – 1.0 ppm in TRDM.
- Vomiting usually at 15 ppm or above.
- Sometimes infertility and death