



Mycotoxin T-2, HT-2, DAS fact sheet

Fungi and molds that grow in grains or forage can produce poisonous compounds (or toxins). These compounds are collectively called “mycotoxins” and may affect the health of both humans and livestock. More than four hundred mycotoxins have been identified, but only a small number are of concern to livestock.

A. What are “T-2”, “HT-2”, and “DAS”?

1. Mycotoxins produced by metabolism of *Fusarium* molds

- a. Class of compounds called “Type-A trichothecenes”
 - i. DAS = “diacetoxyscipernol”
- b. T-2 toxin produced by *Fusarium sporotrichioides*
 - i. Also produces HT-2 and DAS toxins
 - ii. DAS is least common

2. Are potential problem in cereal crop grains

- a. Mainly found in unharvested grains
 - i. Corn, wheat, rice, barley, oats, rye, etc.
- b. May also be found in finished feeds

B. Advisory levels

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

2. Concern level

- a. Level indicating possible favorable conditions for mycotoxin development
- b. Additional testing of feed ingredients or rations may be prudent
- c. Limit amounts fed to livestock if moderate performance effects are observed
- d. Discontinue use (at least temporarily) if pronounced chronic symptoms or acute clinical symptoms are observed

3. Potentially harmful level

- a. Indicates probable involvement of zearalenone in reduced performance, chronic symptoms, or acute clinical symptoms
- b. Discontinue feeding - at least temporarily - if either chronic or acute symptoms are noted
- c. Observe animals closely if symptoms are absent
- d. Continue testing feedstuffs or rations

C. Conditions favoring contamination

1. Toxin production greatest with conditions that promote mold growth

- a. High humidity and temperatures from 40° to 75°F (6° to 24°C)
- b. Cold, wet weather during flowering

Table 1. Guidance levels for trichothecene mycotoxins

Mycotoxin name	Concern level	Potentially harmful		
		Cattle	Swine	Poultry
----- mg/kg or ppm* -----				
T-2	0.25	0.7 to 1.5	0.7 to 1.5	1.0 to 3.5
HT-2	0.25	1.5 to 3.0	1.5 to 3.0	0.7
DAS	0.25	0.7 to 1.5	0.4 to 1.0	---

*multiply mg/kg or ppm by 1000 to determine µg/kg or ppb

- c. Maximum T-2/HT-2 toxin production at temperatures below 60°F

2. Drying grain quickly before storage is strategy to minimize fungal growth and mycotoxin production

- a. Safe moisture thresholds:
 - i. Wheat, barley, oats: 14% to 15%
 - ii. Corn: 14%
 - iii. Rice: 13% to 14%
- b. Minimize insect damage

D. Health effects

1. Trichothecenes inhibit protein synthesis; disrupt DNA/RNA synthesis

- a. Target cells with rapid division
 - i. Gastrointestinal tract linings
 - ii. Precursor cells forming red and white blood cells
 - iii. Decreases antibody levels
 - iv. Sperm precursor cells
- b. Swine are more susceptible than other animals

E. T-2 effects

1. May be synergy between T-2 toxin and aflatoxin

2. Swine

- a. Skin lesions
- b. Digestive tract inflammation, hemorrhage
- c. Vomiting, feed refusal
- d. Possible infertility
- e. Reduced milk at 1.0 to 2.0 mg/kg (1000 to 2000 µg/kg)

3. Cattle

- a. Feed refusal, reduced consumption
- b. Pronounced milk reduction
- c. Ketosis
- d. Sometimes diarrhea
- e. Hemorrhage at 1.0 to 2.0 mg/kg (1000 to 2000 µg/kg)

F. HT-2 effects

1. Swine

- a. Weight loss
- b. Hemorrhage
- c. Diarrhea
- d. Possible infertility at 2.0 to 4.0 mg/kg (2000 to 4000 µg/kg) or lower

2. Cattle

- a. Feed refusal, reduced consumption
- b. Pronounced milk reduction
- c. Ketosis
- d. Sometimes diarrhea
- e. Hemorrhage at 2.0 to 4.0 mg/kg (2000 to 4000 µg/kg)

G. DAS (diacetoxyscirpenol) effects

1. Swine

- a. Estrogenic effects, infertility
- b. Poor gains
- c. Oral and gastroenteric necrosis and hemorrhage at 0.5 to 1.0 mg/kg (500 to 1000 µg/kg)

2. Cattle

- a. Feed refusal, reduced consumption
- b. Pronounced milk reduction
- c. Ketosis
- d. Sometimes diarrhea
- e. Hemorrhage at 1.0 to 2.0 mg/kg (1000 to 2000 µg/kg)

References

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