

# Mycotoxin Quiz

# Pop Quiz

- Which species of «*Aspergillus*» are important that produce aflatoxins?

**Answer:** Aflatoxins are produced primarily by some strains of **A. Flavus** and by most, if not all, strains of **A. parasiticus**, plus related species, *A. nomius* and **A. niger** .

- What are aflatoxins?

- **Answer:** Aflatoxins are toxic metabolites produced by certain fungi in/on foods and feeds. They are probably the best known and most intensively researched mycotoxins in the world.

- What are major aflatoxins responsible for toxicity in animals?
- **Answer:** There are four major aflatoxins: **B1, B2, G1, G2** plus two additional metabolic products, **M1** and **M2**, which are of significance as direct contaminants of foods and feeds.
- What are signs and symptoms of aflatoxin poisoning in animals?
- **Answer:** Aflatoxicosis is primarily a hepatic disease. Aflatoxins cause **liver damage, decreased milk and egg production**, recurrent infection as a result of **immunity suppression** (e.g., salmonellosis). These toxins result in embryo toxicity in animals that consume low dietary concentrations. The young ones are most susceptible; all ages are affected but in different degrees for different species. Other signs of aflatoxicosis in animals include gastrointestinal dysfunction, reduced reproductivity, reduced feed utilization and efficiency, anemia, and jaundice. Nursing animals may be affected as a result of the conversion of aflatoxin B1 to the metabolite aflatoxin M1 excreted in milk of dairy cattle. Aflatoxin B1, aflatoxin M1, and aflatoxin G1 have been shown to cause various types of cancer in different animal species. However, only aflatoxin B1 has been identified as a carcinogen

# Pop Quiz

- What is ryegrass staggers disease?
- Endophytes (fungi that live inside the plant) that produce the mycotoxin Lolitrem B is responsible for ryegrass staggers. This disease can be a serious problem in livestock grazing perennial ryegrass pasture during the summer and autumn months. It is most commonly seen in sheep and cattle, but horses, deer, and alpaca are also susceptible. While ryegrass staggers have not been recorded in goats, they may also be susceptible but may not develop symptoms due to their different grazing/browsing habits. Affected animals develop muscle tremors and incoordination, which worsens with stress and external stimuli (Fig. 15.44). They may have a stiff gait, which can progress eventually to paralysis. This is not the same disease as grass tetany (which is sometimes referred to as grass staggers). Ryegrass staggers is caused by a group of toxins that accumulates in the leaf sheaths of perennial ryegrass, whereas grass tetany is caused by low blood magnesium.

# Pop Quiz

- Which toxin(s) is produced by Zearalenone?
- **Answer:** Zearalenone (ZEN), also known as RAL and F-2 mycotoxin, is a potent estrogenic metabolite produced by some *Fusarium* and *Gibberella* species, *F. verticillioides*, and *F. incarnatum*. These species produce toxic substances of considerable concern to livestock and poultry producers, namely deoxynivalenol, T-2 toxin, HT-2 toxin, diacetoxyscirpenol, and zearalenone.

- Why pigs and cattle differ in their susceptibility to zearalenone?
- **Answer:** Zearalenone toxins are produced by *Fusarium* spp. (Fig. 15.43). In pigs, the major metabolite of Zearalenone is  $\alpha$ -zearalenol, which has greater affinity for estrogen receptors than  $\beta$ -zearalenol, which is formed in cattle. Hence, pigs are more susceptible than cattle.
- What is the toxic potential of Zearalenone?
- **Answer:** Zearalenone produces an estrogenic effect in that it will stop ovulation in ewes and can cause reduced lambing percentages from 5% to 50% and is considered as the main cause of a long drawn out tugging season.

# Pop Quiz

- What is facial eczema?
- **Answer:** Facial eczema is a type of sunburn (photosensitization) affecting exposed areas of pale skin of sheep (Fig. 15.41) and cattle due to liver damage. It is caused by a poisonous substance called “sporidesmin,” which is produced on pasture plants by the fungus *Pithomyces chartarum*, which lives in dead vegetative material in pastures, especially perennial ryegrass. Facial eczema is an example of “secondary photosensitization,” in which the skin lesions are really the secondary result of liver damage, rather than the direct result of a plant toxin

# Pop Quiz

- What are the clinical symptoms of facial eczema in animals?
- **Answer:** The clinical symptoms of facial eczema are distressing: restlessness, frequent urination, shaking, persistent rubbing of the head against objects (e.g., fences, and trees), drooping and reddened ears, swollen eyes, and avoidance of sunlight by seeking shade. Exposed areas of skin develop weeping dermatitis and scabs that can become infected and attractive to blow fly causing myiasis.



# Pop Quiz

- What is fescue toxicosis?
- **Answer:** Most tall fescue (*Festuca arundinacea*) is infected with a fungal endophyte. The endophyte produces toxins that cause a number of problems for grazing animals, although sheep appear to be less affected than cattle and horses. However, sheep are prone to “fescue foot,” hyperthermia, poor wool production, and reproductive problems, as well as lowered feed intake and the resulting poor weight gains. Stockpiled fescue is less toxic.



Fescue toxicosis in horse

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