

Another Concern For Livestock Producers – Aflatoxins



DR. TERESA L. STECKLER

SIMPSON, ILL.

As if livestock producers have not had enough to worry about, now it is time to remind everyone of the potential for aflatoxins in feedstuffs. Aflatoxins are secondary mold metabolites produced by some strains of *Aspergillus flavus* and other related species of *Aspergillus* fungi. The four most common aflatoxins are B1, B2, G1, and G2.

Fungal growth and aflatoxin contamination are the consequence of interactions among the fungus, the host and the environment. Water stress, high-temperature stress, and insect damage of the host plant are major determining factors in mold infestation and toxin production. Similarly, specific crop growth stages, poor fertility, high crop densities, and weed competition have been associated with increased mold growth and toxin production.

Preharvest aflatoxin formation is also affected by associated growth of other molds or microbes and aflatoxins often occur in crops in the field prior. Preharvest aflatoxin contamination of peanuts and corn is favored by high temperatures, prolonged drought conditions, and high insect activity.

Postharvest aflatoxin production will continue as long as the mold feeds on the corn in the field, on a truck after harvest, or in a grain storage tank. Insect or rodent infestations facilitate mold invasion of some stored commodities. Postharvest production of aflatoxins on corn and peanuts is favored by warm temperatures and high humidity and it will not stop until the corn is at or below 13 percent moisture.

The commodities with the highest risk of aflatoxin contamination are corn, peanuts, and cottonseed. Contaminated grains and grain byproducts are the most common sources of aflatoxin. Corn silage may also be a source of aflatoxins, because the ensiling process does not destroy toxins already present in silage.

Aflatoxicosis is a disease caused by the consumption of aflatoxins. Aflatoxicosis is primarily a hepatic disease. The susceptibility of individual animals to aflatoxins varies considerably depending on species, age, sex, and nutrition. In fact, aflatoxins cause liver damage, decreased milk and egg production, recurrent infection as a result of immunity suppression (eg. salmonellosis), in addition to embryo toxicity in animals consuming low dietary concentrations.

Beef and dairy cattle are more susceptible to aflatoxicosis than sheep or horses. While the young of a species are most susceptible, all ages are affected but in different degrees for different

species. Pregnant and growing animals are less susceptible than young animals, but more susceptible than mature animals.

Aflatoxins are metabolized in ruminants by the liver and are excreted in the bile. Aflatoxin B1 is the most potent mycotoxin (toxic substance produced by a mold) to affect cattle. B1 increases the apparent protein requirement of cattle and is a potent carcinogen (cancer causing agent).

Clinical signs of aflatoxicosis in animals include: feed refusal, reduced growth rate and decreased feed efficiency, listlessness, weight loss, rough hair coat, mild diarrhea, and anemia along with bruises and subcutaneous hemorrhage. The disease may also impair reproductive efficiency, including abnormal estrous cycles (too short and too long) and abortions. 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. Other symptoms include impaired immune system response, increased susceptibility to disease, and rectal prolapse.

The diagnosis of aflatoxicosis is often difficult due to the variation in clinical signs and the presence of infectious diseases due to the suppression of the immune system. On the farm, more than one mold or toxin may be present in the contaminated feed, which often makes definitive diagnosis of aflatoxicosis difficult. The prognosis of aflatoxicosis depends upon the severity of liver damage. Once overt symptoms are noticed the prognosis is poor. Treatment should be directed at the severely affected animals in the herd and further poisoning prevented.

If aflatoxicosis is suspected, the ration should be analyzed immediately. If aflatoxins are present, the source should be eliminated immediately. Levels of protein in the ration and vitamins A, D, E, K and B should be increased as the toxin binds vitamins and affects protein synthesis. Good management practices to alleviate stress are essential to reduce the risk of secondary infections.

Due to the drought conditions this year, it is recommended to test your silage and corn for aflatoxin contamination. The recommended feeding level is 0 parts per billion (ppb). However, the level of aflatoxin an animal can tolerate will depend upon the age and sex of the animal, its health status, and overall management level of the farm. There are no clear cut safe feeding levels. Safe levels vary with each individual animal. Be sure to monitor animal health closely and discontinue the use of contaminated feed immediately if undesirable effects are noticed. Δ

DR. TERESA L. STECKLER: *Extension Specialist, Animal Systems/Beef, Dixon Springs Agricultural Center, University of Illinois*