Alfatoxin in the 2012 Corn Crop and the Potential Impact on Its Use for Livestock

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September 19, 2012

Sampling and Testing in Grain: A Recap - Reports of aflatoxin contamination of corn continue to come in from some parts of the state, especially those areas most severely affected by drought conditions. There have also been reports of a few loads of grain being docked at some elevators due to aflatoxin levels above thresholds. Producers in affected areas are encouraged to continue sampling and testing grain for aflatoxin in order to determine whether or not the grain is contaminated and at what level. These are the first and most important steps when making decisions as to what to do with contaminated grain.

Two weeks ago in a BEEF Cattle letter article we provided guidelines for sampling and testing for aflatoxin, and grain handling to minimize toxin buildup in storage. In this week's newsletter, we provide a quick recap of testing and sampling protocols, alone with guidelines for feeding contaminated grain to animals.

Remember, toxin contamination is never uniform throughout a grain lot; therefore it is extremely important to pull multiple samples from every part of the lot in order to obtain a representative sample. When sampling from the grain stream, collect samples at regular intervals. Pool and mix the individual samples into one composite sample from which about 5-10 lb. of grain should be sent for testing.

The black-light or UV light test can be use used as an initial screen for aflatoxin, but should not be relayed upon as conclusive evidence of the presence or absence of aflatoxin. Other particles in the sample may also glow under UV light, giving a false positive result.

Commercial quick-test kits are better than the black-light test in that they are specific for aflatoxin. However, several of these tests are only qualitative or semi quantitative, meaning that they tell you whether or not the grain is contaminated or whether the level of contamination is within a certain range, but do not provide precise estimates of the levels of contamination.

By far, the best way to test for aflatoxin is to send samples to an analytical laboratory. Tests from these labs are usually accurate and provide quantitative estimates of the level of contamination. Grain usage and marketing decisions such as dockage and price discounts should be made based on results from analytical lab tests rather than black-light or commercial quick tests.

Animal Use - With the increased risk for alfatoxins in drought-stressed corn, the use of this corn for animal feed needs careful evaluation. The toxicity of the aflatoxin is affected by the amount consumed by the animal and the duration of the consumption, and there are differences among species on the sensitively to aflatoxin toxicity. Aflatoxin accumulates in the liver of the animal, and thus affects the metabolism of this key organ.

The subclinical effect is most often reduced performance (growth or milk yield) and thus reduced feed efficiency. High concentrations for extended periods can result in liver damage and death. In general, the sensitivity of the species is (from highest to lowest sensitive): swine and poultry,

horses, and ruminants (sheep and cattle). With contaminated corn, the risk is higher with the species that consume diets highest in grain concentration (e.g., swine and poultry; horses and ruminants consume a lot of forage). Diets for swine, poultry, and horses should not exceed 200 ppb. Diets with as much as 400 ppb fed to feeder cattle can result in tissue residues of aflatoxin.

Besides the health of the animal, aflatoxin consumption by dairy cattle needs to be monitored to prevent aflatoxin concentration in milk from exceeding tolerances set by the Food and Drug Administration (FDA). The FDA limit is 0.5 ppb for aflatoxin in milk, which has been the limit for many years. Just recently, some milk processing companies have sent out letters to dairy producers about the aflatoxin contamination issue and how the milk will be handled, indicating that if the producer's milk is found to exceed 0.5 ppb that the milk must be dumped and the producer incur the loss. There is about a 1% transfer of aflatoxin in the diet to the milk.

As mentioned earlier, dairy cattle consume a large portion of their diets as forage. So if the grain had 20 ppb and it is fed in a diet for dairy cattle that's 50% forage/50% concentrate and the contaminated corn made up 80% of the grain, then there would be about 8 ppb aflatoxin in the TMR. Then with a 1% transfer, there is the potential for 0.08 ppb aflatoxin in milk - 6.25 times below the threshold level.

The primary approaches to prevent problems with aflatoxins on animals or their products is to:
1. avoid feeding contaminated grain if possible,
2. if contaminated grain is feed, it should be diluted with un-contaminated grain and/or with forage to lower the dietary contamination to a low risk level,
3. or add a mycotoxin binder to the diet to reduce the absorption of the aflatoxin. Several of these binders are available commercially and should be used according to the label.