Aflatoxin: Handling Corn

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Abstract
Corn with known levels of aflatoxin must be directed toward the appropriate feed use, with documentation to the seller of its condition. Normally, aflatoxin corn cannot be blended for the purpose of diluting the aflatoxin concentration. However, in high incidence years, FDA has generally granted a waiver to allow blending for use in livestock feed, using prescribed blending and testing procedures, and with documentation to accompany the blended grain. Iowa has asked for this waiver in 2012; FDA response is forthcoming. Under no circumstances should corn known to contain more than 20 ppb aflatoxin be offered for sale to the general market where the final use is not known at the time of sale. All U.S. export corn is tested for aflatoxin at the port, before it can be loaded on a vessel. By contract, most U.S. export DDGS and gluten feed/meal is also tested. Corn co-products are particularly sensitive because the aflatoxin is concentrated 3 to 1 from the levels of the source corn. In all cases, the very high potential error generated by any aflatoxin analysis should be considered.

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Aflatoxin: Handling Corn

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The overall incidence of aflatoxin will determine the degree of testing and special handling that will be needed. If the incidence is scattered, relatively infrequent and generally at a low level (most affected samples less than 50 ppb), the normal mixing and handling at elevators will likely hold averages below 20 ppb. However, there are markets with lower thresholds than 20 ppb (corn wet milling, ethanol plants that export DDGS, feed mills serving dairy); those markets, and their corn suppliers, may test or screen more intensively. Processors typically do not have separate storage or blending capability; these markets are more likely to reject corn based on the aflatoxin concentration.

If the incidence is more frequent and/or the levels of affected lots are higher, load by load screening should be done. The black light test is the quickest but only gives a yes or no result, with some degree of error. Test kits will cause delays in unloading as trucks wait for results before dumping. Either method will give segregation of okay and high, with the high being directed to the appropriate animal feed. If high aflatoxin corn is accepted against a warehouse receipt, the aflatoxin status will be noted on the receipt.

The most severe situation, not likely in Iowa this year, would be a high frequency of aflatoxin loads, and some values very far above 20 ppb (in the high 100s or 1000s ppb). That would mean a quantitative (test kit) result on every load with fairly complex segregation to maximize the use among livestock.

Monitoring

Testing every load, even with the black light method, is time consuming. Another approach is to collect a composite sample composed of portions from a series of loads or lots. For sampling into or out of a storage bin, take a random cut through the flowing stream to get at least a pound of...
corn from each load. Mix and divide to about 10 lbs for submission to the lab. For monitoring loads coming to a receiving point, such as an elevator or processing plant, put a portion of the sample normally taken for quality testing into a bucket, then mix and divide if needed to obtain 10 lbs for submission to the lab. The portion used for moisture testing will normally provide ½ -1 lb per load.

The composite method will estimate average levels of toxins and of other quality measures if desired. It will not identify the highest levels or the variation of levels. With accurate recordkeeping, possible contributors can be identified if a composite shows an unexpected value.

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