

Mycotoxins & Distillers' Grains

With the increased feeding of distillers' grains, producers should note the concentrated potential for contamination.

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PHOTO BY MATHEW ELLIOTT

If you pick up any feeding guide on distillers' grains, somewhere in the text you will find a warning about the potential for mycotoxin contamination. This is not to say that distillers' grains are more likely than other feeds to be contaminated, but rather that mycotoxins from the original corn can be concentrated in the spent grains.

If the original corn is contaminated with mycotoxins, the distillers' grains produced from it can contain two to three times the amount of the original mycotoxin concentration. This is because only about one-third of the original grain remains

as distillers' grains residue, resulting in a concentration of the mycotoxins.

The mycotoxins are not thought to be destroyed during the distillation process. None of the mycotoxins are found in the ethanol. Actual retention of mycotoxins from the original corn to distillers' grains is not defined well by research, and small amounts of mycotoxins may be destroyed in the process as occurs under some other processing conditions.

In addition, mycotoxins can be produced during storage if the grains are allowed to mold. Molding is most likely to occur if

grains are insufficiently dried or wet grains are improperly stored.

Contaminants

While there are several mycotoxins that can contaminate corn grain, aflatoxin is of greatest concern because it is a carcinogen and can be transferred to cow's milk. The Food and Drug Administration (FDA) sets an action level for aflatoxin in feed of less than 20 ppb (parts per billion) and for milk at less than 0.5 ppb.

In the United States, aflatoxin is a common problem in Southern states, but it has shown up sporadically in other areas, including the Midwest. A considerable amount is found in drought years, like that seen in the Midwest in 1988.

Fumonisin is another mycotoxin of concern for which the FDA has issued guidance values ranging from a low of 5 ppm (parts per million) for ingredients used for horse feeds to 100 ppm for ingredients going into feed for poultry raised for harvest. Horses are particularly sensitive to fumonisin. Generally, feed ingredients should contain less than 20 ppm of fumonisin when used for swine and less than 10 ppm when used in dairy diets.

Other mycotoxins like deoxynivalenol (DON, vomitoxin), zearalenone, T-2 toxin and ochratoxin can also contaminate corn and be concentrated in the distillers' grains. The FDA advises that in the case of DON, feed ingredients for beef cattle and chickens should contain less than 10 ppm, while ingredients for swine and dairy cattle should contain less than 5 ppm.

Test and monitor

Although guidance values are related to individual mycotoxins, it is, however, important to note that mycotoxins rarely occur individually. Indeed, if analysis determines the presence of one particular indicator mycotoxin, evidence suggests that others are very likely to be present. Mycotoxins are often synergistic, meaning that combinations have a greater effect than single toxins. As a result, seemingly low levels of individual mycotoxins become important. So even if the feed samples tested come back as being "low," there may still be an issue.

While there has been little official monitoring, commercial testing laboratories have seen substantial concentrations of DON in both corn and distillers' grains from parts of the Midwest during the past year. Because these results are from commercial testing laboratories, the samples and results are not representative, but more likely represent problem situations where

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CONTINUED ON PAGE 128

Mycotoxins & Distillers' Grains CONTINUED FROM PAGE 126

mycotoxins are suspected. Mycotoxins in these samples may have originated from the corn from which they were made or be produced from mold growing during storage of the distillers' grains. The laboratory reports do tell us that distillers' grains, like all other feeds, have the potential to contain mycotoxins and can be a feeding problem.

This year the U.S. Department of Agriculture has been sampling distillers'

feeds from all across the U.S. during all seasons to determine the incidence and concentrations of aflatoxin. Sample collection is due to be completed by this September. It is hoped these data will give us a better idea of the possibility of aflatoxin in distillers' grains coming directly from the distillery.

Untreated wet distillers' grains can mold and produce mycotoxins if not fed rapidly within one or two weeks. Wet distillers'

grains stored for a longer period should be treated with organic acids and/or stored as you would silage. Research from South Dakota shows that wet distillers' grains are stable when blended 50:50 with corn silage and ensiled. Research from Nebraska indicates that blending wet distillers' grains with hay or straw makes the grains easier to handle and to put into a silo or silo bag.

Some methods of mycotoxin decontamination of feeds do exist. Research

has indicated that several chemicals and processes can destroy some of the mycotoxins during the fermentation process or in the distillers' feeds after production. Research has also identified feed additives, such as B-glucans, which can reduce the toxicity of mycotoxins by reducing mycotoxin absorption in the animal. Reduced intestinal absorption of mycotoxins results in less exposure to the animal and less transfer to milk in ruminants.

The National Corn Growers Association (NCGA) lists the potential for mitigating mycotoxin contamination as one of their seven high-priority focus areas. In an Iowa State University (ISU) study, two out of 20 ethanol plants were testing all inbound corn, while 13 were routinely testing corn but not every load. The indication was that testing frequency would be increased by distillery managers if a problem was suspected in the current harvest year.

Like the corn it is made from, distillers' grains may contain mycotoxins. However, in some years it appears necessary to increase mycotoxin monitoring by increased observations and testing of the corn destined for the distillery. Proper storage and feeding management of distillers' grains is essential to prevent mold growth and mycotoxin production.

