## **TECH TALK**

## **Mycotoxin Risk for the Remainder** of 2021 Crop

**Article Provided By:** 



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Mycotoxins are the metabolites of Fusarium, Aspergillus and Penicillium molds. The growing season of 2021 impacted corn crop stress via drought and late-season rainfall and provided an environment for molds to flourish and produce mycotoxins. The delay in harvesting in some regions added to this mycotoxin risk, as the crop was exposed to those environmental conditions for a longer period of time. Aspergillus molds are more prevalent in hot and dry conditions, while Penicillium molds are a greater risk for fermented feedstuffs. As such, in a typical growing season, mycotoxins produced by Fusarium molds are a more likely to manifest. These mycotoxins can include deoxynivalenol (DON), T-2/HT-2, zearalenone (ZEA), fusaric acid, fumonisin and emerging mycotoxins such as enniatins, moniliformin and beauvericin.

Based on an analysis of the Alltech 37+ data for corn samples submitted from November 1, 2021, through April 30, 2022, mycotoxins produced by Fusarium molds are the most commonly occurring. Fusaric acid was present in 88.32% of the samples, DON in 81.22%, fumonisin in 62.99% and ZEA in 37.57%. These samples averaged 6.2 mycotoxins per sample, with 94.6% of the samples containing multiple mycotoxins. This is important because the most occurring Fusarium mycotoxins listed for 2021 can not only impact health and performance through additive actions but can also act through synergistic actions to magnify their impact. As a result, as the risk is analyzed, it may be higher due to those synergistic actions.

The most prevalent risk in the 2021 corn crop came from DON and ZEA, primarily due to stress throughout the growing season and added late-season rains prior to harvest. The averages in parts per billion (ppb) for 2021 are shown in Figure 1, along with the five-year averages.

	2017	2018	2019	2020	2021
DON, ppb	888	1003	1205	1105	1729
Zearalenone, ppb	66	177	152	17	131
Number / Sample	5.3	7.2	7.7	6.4	6.2

Figure 1. Average for DON and ZEA for the corn crop for past five years

Both 2018 and 2019 were record wet years back-to-back, and the risk generated to swine and poultry was higher as a result. The risk extended to feed intake, digestion, ADG, FE, egg production and quality, gut integrity, reproduction, liver function and immune response. This risk was reduced in a drier 2020 harvest but is back to higher risk levels for the 2021 crop.

The measure of risk at harvest can change throughout storage. Moisture and oxygen are two inputs required for mold growth and subsequent mycotoxin production. Corn grain is not stored in an oxygen-free environment, and when not dried to 14% moisture or less prior to storage, spoilage and mycotoxin production is possible. Once mold growth begins, it can produce enough moisture through respiration. Mycotoxin levels trend higher in broken and damaged kernels, and as corn is removed from the bins, these damaged kernels tend to be concentrated in the center and lower levels. Therefore, as bins are emptied and swept or cleaned, the mycotoxin risk can significantly increase. This increase in risk is illustrated in Figure 2.



## Figure 2. Percent of high, moderate and low mycotoxin risk in 2021 corn grain samples over time

This data clearly shows that the percentages of higher-risk samples increase and lower-risk samples decrease from November through April. This trend is expected to continue throughout the storage and use of the 2021 corn crop. To compound this risk situation, the corn supply was limited in some regions due to drought. As domestic corn usage rates are up over the numbers in 2020 and the current price for corn has created a demand for corn in some regions, altogether, this means that higher-risk corn will be fed to monogastrics and not just transferred to ruminant feeds. This can put livestock and poultry at a considerably higher risk for health and performance issues. The risk is quite similar with corn silage for ruminants, with a similar mycotoxin risk profile that has remained high since harvest. This has sharply curtailed producers' ability to blend high- and low-risk forage to decrease the overall risk to cow health and performance. The cost and availability of low-risk feedstuffs will continue to curtail livestock producers' ability to manage their livestock and poultry feeding programs.

There will be areas with lower mycotoxin levels and a lower risk. However, low-risk does not necessarily mean no-risk. As stated earlier, there may be both an additive and synergistic impact from multiple mycotoxins. These actions can persist no matter the level of mycotoxins present. The impact of lower-risk mycotoxins using 2021 corn data is shown in Figure 3.

## Figure 3. Potential performance impact due to low-risk mycotoxin levels from 2021 corn crop

	Gain Lost, Lbs.	Change in FCR, %
Broilers	.0510	0.73 – 1.16
Nursery Pigs	.2545	0.38 – 0.43
G/F Pigs	4.0 – 5.28	3.29 – 3.43

Using conservative feed prices, performance values and market prices, gains and the feed conversion rate (FCR) may be impacted. The mycotoxins at lower risk levels will not have a dramatic, severe impact. However, at lower risk levels, the lost gains and FCR will not be identified until closeouts are completed. FCR is certainly important due to high feed costs, and lost gains equal a reduced income to pay for input costs.

Monitoring the mycotoxin levels is highly recommended to help identify the risk. This will provide producers with the information to allow them to position a mycotoxin management program that will help ensure expected health and performance for more efficient and sustainable livestock production.

For more information, visit knowmycotoxins.com.

Publication Date: 06/01/2022