




Alltech
MYCOTOXIN
MANAGEMENT

MANAGING MYCOTOXINS IN THE FEED MILL

Rapid testing keeps the mill running while effectively managing mycotoxins.



Alltech® MYCOTOXIN MANAGEMENT

To put it simply, mycotoxins can be found everywhere.

Triggered after the right growing conditions for fungi occur, millions, perhaps billions, of spores rapidly multiply to produce toxic mycotoxin byproducts that, when ingested at high enough levels, can be catastrophic to animals and humans.

“Mycotoxins are very prevalent,” said Dr. Max Hawkins, nutritionist for the Alltech® Mycotoxin Management team.

Their Alltech 37+® mycotoxin analysis program can now identify more than 40 different types of mycotoxins, runs over 14,000 samples collected worldwide each year through its labs in Lexington, Kentucky, and Dunboyne, Ireland.

“The recent Alltech 37+ results confirm that the spectrum of mycotoxins in common animal feed commodities is much broader than many people think, whatever continent you are farming on,” said Hawkins. “While 97 percent of samples coming into our Kentucky and Ireland labs contain at least one mycotoxin, 89 percent contain multiple mycotoxins.”

“While management by farmers can have an impact on mycotoxin prevalence, Mother Nature is ultimately calling the shots.”

Alltech data reveals that the most prevalent feed mycotoxins worldwide are fumonisins, type B trichothecenes and fusaric acid. Aflatoxins tend to be a threat in warmer areas of the world or in feed containing grain grown in warmer climates.

While agronomic management by farmers in the field can have an impact on mycotoxin prevalence, Mother Nature is ultimately calling the shots, said Hawkins, with increasing climate pressures continually evolving mycotoxin incidence around the world.

“Weather is the number one factor because the right conditions will lead to the growth of millions of mold spores already out in fields,” he said. “Certain ones, such as *Aspergillus*, which leads to the production of aflatoxins, thrive in warm, dry conditions.

“As we’re seeing climate change have an impact on North America and certain parts of Europe, areas that aren’t historically high in aflatoxins need to be more closely monitored,” he continued.

“And with traditional tilling and crop rotation practices diminishing, too, in many developed countries, mold contamination is persisting year on year, making the multiple mycotoxin threat very real.”

DEVELOPING A MYCOTOXIN MANAGEMENT PLAN

The high frequency of mycotoxins cements the need for feed mills to have a management plan to mitigate risks, according to Pat Frasco, director of sales for milling, grain and pet food at Neogen.

“This is for a variety of reasons,” he said. “In the United States, feed mills are mandated by law under the Food Safety Modernization Act (FSMA) to have a food safety plan that includes managing risks such as mycotoxins. On a global scale, a similar management plan should be put into place to ensure standards of feed are maintained for customers.”

“Testing needs to be in proportion to the relative risk, so it’s not always a simple ‘yes, no, always or never’ kind of answer.”

Many feed mills are managing mycotoxin challenges in various steps, said Frasco, which may require ingredient suppliers to provide documentation that their feedstuff falls within the acceptable toxin concentration levels. However, test results aren't always going to be a simple, binary answer, he said.

“The mycotoxin management plan put into place must assess how high a toxin level is and how much of a risk it may be to a particular species, because some species can safely consume higher levels than others,” explained Frasco. “The testing performed needs to be commensurate with the relative risk, so that it is not a simple ‘yes, no, always or never’ kind of an answer.

“The primary element in a feed mill’s inbound screening program is to know the risks associated with each ingredient, so the end feed product will be within the limits set for various species,” he added.

With the management of this risk in mind, Neogen developed a unique program to assist the grain industry.

The company’s Monday Mycotoxin and Crop Report is a weekly broadcast designed to provide up-to-the-minute information on factors affecting the quality of grain both in the field and in storage. The broadcast covers weather and other conditions affecting mycotoxin formation as well as timely tips on mycotoxin management.

The report combines the expertise of Neogen’s scientists, technical service personnel and information gathered from its mycotoxin reporting network, spanning dozens of grain testing and research facilities across the United States and Canada. The broadcast often features expert commentary provided by scientists and field personnel from companies such as Alltech.

“What’s also key to sound mycotoxin management is the adoption of a mycotoxin proficiency and testing program to ensure that technicians performing mycotoxin testing are producing accurate results,” said Frasco. “Neogen offers a biannual proficiency testing program for each of the major mycotoxins to meet the verification requirements of FSMA, auditing bodies and the company’s own testing requirements.”



IMPLEMENTING RAPID TESTING

While detailed and accurate testing at the point of purchase is crucial to a comprehensive mycotoxin management plan, the need for fast test results is even more essential.

“Testing is not only going to take personnel resources, but it can require lab equipment as well,” said Hawkins. “Feed mills need to not only minimize the resources that testing requires, but also

keep it from slowing their current process down. Sampling and testing need to fit into an existing schedule.”

To keep up with the need for a faster turnaround for mycotoxin testing results, Neogen is developing a new line of lateral-flow mycotoxin tests with a common water-based extraction, a user-friendly, environmentally safe test for use on-site in the feed mill.



THE NEOGEN REVEAL[®] Q+ MAX

A new testing process developed by Neogen, the Reveal[®] Q+ MAX test, can accurately screen for aflatoxins, deoxynivalenol (DON) and ochratoxins in under 10 minutes, significantly cutting down on the waiting period during sample analysis. By 2018, the tests will also be able to identify fumonisin, T-2/HT-2 and zearalenone.

HOW DOES IT MANAGE THIS?

“Once a sample has been collected and ground, a test strip for each mycotoxin is inserted,” explained Frasco. “As the sample wicks up the side of the strip, a control and test line appear. The handheld AccuScan®Gold reader then converts the line densities into a quantitative result displayed in parts per billion (ppb) or parts per million (ppm), allowing feed mill operators to make a management decision in a very short amount of time.”

Alltech® RAPIREAD™

Alltech has drawn on Neogen’s expertise to develop its new Alltech® RAPIREAD™ system, which incorporates the portable Reveal Q+ MAX mycotoxin test kits and is designed to work equally well in the feed mill or on-farm.

However, the laboratory-based Alltech RAPIREAD support package builds a more comprehensive picture of the mycotoxin challenge, allowing users online access 24/7 to the more comprehensive Alltech 37+ analytical results. The Alltech support package also incorporates the company’s Alltech® PROTECT™ Calculator, which helps users develop a picture of the potential cost of any mycotoxin contamination.

“Combining known mycotoxin risk, production statistics, feed prices and commodity market values, this amazing new tool will show the estimated financial cost based on the level of mycotoxin contamination, helping to quantify the significance of mycotoxins on farmer profitability,” said Hawkins.

“We can also draw on our Alltech® DIET™ Estimator tool, which can combine mycotoxin contamination results and subsequent risk of individual feedstuffs with the inclusion rates of those individual feedstuffs to give an estimated total dietary mycotoxin risk for complete feed.”

TESTING POINTS

Point of purchase isn't the only place testing needs to be implemented, added Hawkins, noting that complete feed products should be tested to make sure that mycotoxin levels remain in a safe range for the species for which the feed is destined.

“Say a feed mill buys wheat at 4 ppm of DON because they know in the manufacturing process that the feed will not be 100 percent wheat — it may be 50 percent wheat, which means it will drop to 2 ppm DON in the finished feed,” said Hawkins. “The finished feed still needs to be tested to evaluate if the mycotoxin management program is really working.”

Testing on complete feeds with a test such as Alltech 37+ adds further information on the synergistic relationship that occurs when multiple mycotoxins are found in one feed source. Often, it is the simultaneous presence of various mycotoxins that increases the potential toxicity to livestock.

“We are continually learning more and understanding how certain mycotoxins react to each other,” said Hawkins. “If only a single mycotoxin is found, then we can look at it as $1+1 = 2$. However, when multiple mycotoxins are together, $1+1$ sometimes = 3, 4 or 5. The synergistic effect makes it much more complicated, particularly as we get into more complex feeds, making it essential that mycotoxins are closely assessed prior to entering the animal food chain.”

More information on the Monday Mycotoxin and Crop Reports is available on the Neogen YouTube channel:

<https://www.youtube.com/playlist?list=PLL-39MLXhaBluCC6QDvPbCgNgBfGL4pPc>



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