

# Harvest 2023: An Insight into the European and U.S. Mycotoxin Risk

As the agricultural industry navigates the complexities of the ever-changing climate, the impact on crop quality and mycotoxin presence remains a subject of close examination. This was one of the most debated topics at the recent World Mycotoxin Forum in Belgium, and a comparison of the growing seasons of 2022 and 2023 in the U.S. and Europe reveals how these changing climate dynamics are creating varying challenges for the feed and livestock industries.

To better understand climate dynamics across different regions, Alltech relies on innovative tools and services like CropProphet, a weather-driven grain yield forecasting system designed to help global agriculture industry participants with an interest in grain quality and yield.

## The Alltech Harvest Analysis: Unveiling the Most up to Date Insights

The Alltech Harvest Analysis, a decade-long initiative, is a comprehensive step in understanding the complexities of new crop quality and mycotoxin prevalence. The program captures trends and enables robust data comparisons across years and regions. This analysis plays a pivotal role in empowering feed and livestock producers with the knowledge they need to make informed decisions.

With collaborators like SGS, the program boasts a diverse pool of internal and external data sources, ensuring a representative snapshot of the global grain trade. This connection extends benefits to feed and livestock producers in regions like Asia, where the quality of imported grains significantly influences overall production.

## Contrasting Conditions in Europe: A Closer Look

In Europe, the stark contrast between the 2022 and 2023 growing seasons has been particularly evident. Last year's growing season was dominated by widespread drought across the continent. In 2023, however, there has been a distinct split between north and south. In northern Europe, a long dry spell in May and June was followed by a summer of wet and damp conditions. This delayed harvest on many farms and led to the ideal conditions for Fusarium molds to flourish. South of the Alps, dry weather continued to prevail, but we've not seen the same drought impact as in recent years.

With many new crop wheat and barley samples already tested at our Alltech 37+® lab, we can see a distinct pattern emerging. The damp conditions have led to a higher than normal mycotoxin risk in small grains. Many of these samples would have originated in Germany, Denmark and Ireland. Figure 1 details the risk overview. Although emerging mycotoxins remain the most prevalent mycotoxin group, the type B trichothecenes, such as deoxynivalenol, will present the most risk to animals. The maximum level of type B trichothecene, measuring 14,074 ppb, was detected in a barley sample.

As the corn harvest is later than small-grain harvests, at the time of writing we do not yet have a complete picture of risk profiles in this ingredient. However, encouragingly, in what has been tested to date, the quality does seem much better compared to 2022, with much less aflatoxin risk. This will be a relief to feed and livestock

producers who have had to navigate significant aflatoxin levels in European corn over the past few years.

Forages such as corn silage and grass silage tend to be higher risk when Alltech's REQ metric is applied to dairy cows. Of the over 150 samples tested so far, emerging mycotoxins, type B trichothecenes and Penicillium mycotoxins are most prevalent. The heightened level of Penicillium mycotoxins continues to pose concerns for dairy and beef producers across northern and western Europe. Both the presence and levels of this group of toxins has been continually trending upward over the past 5 years.




Summary of European wheat and barley		Mycotoxin concentrations (ppb), occurrence (%) and total risk (REQ) for selected samples		
		Average	Maximum	Occurrence
 24/07/2023 to 24/10/2023 Sample data range   4.6 Average mycotoxins per sample   93% Samples with 2 or more mycotoxins	Emerging Mycotoxins	395.8	4,611	97.7
	Type B Trichothecenes	322.5	14,074	58.5
	Type A Trichothecenes	26.9	517	40.9
	Fumonisin	13.6	414	19.3
	Other Penicillium Mycotoxins	13.8	517	11.9
	Zearalenone	10.1	424	7.4
	Ergot Toxins	17.3	1,753	5.7
	Fusaric Acid	1.1	58	4.5
	REQ for pigs – Grow finish pigs	103.9	1,593	
	Percent of samples at lower, moderate or higher risk REQ for grow finish pigs		Higher 24.4%	Moderate 19.0%

Table 1. Preliminary 2023 European Harvest Analysis data, a summary of wheat and barley for pigs, detailing mycotoxin concentrations (ppb), occurrence (%) and total risk (REQ) for selected samples.

## The U.S. Crop Situation

Like Europe, the U.S. has been faced with distinct regional variations in weather conditions this year. Many southern states have witnessed an extended period of above-average rainfall, which may bring a heightened risk of Fusarium mold and mycotoxin production. Conversely, farther north in the central and northern plains, there has been a deficit in precipitation.

Despite the dry conditions, Fusarium toxins are still presenting the greatest level of risk. Dr. Max Hawkins of Alltech's mycotoxin management team comments that the availability of leaf surface moisture could be a contributing factor. In a similar manner to 2022, it is possible to track distinct mycotoxin patterns from west to east. In general, samples from the western U.S. are lower risk than those further east. Although over 50% of corn silage samples are deemed lower risk, plenty of Fusarium-related challenges are still detected, with a notably high maximum level of type B trichothecenes (Figure 2).

U.S. corn testing is underway, and mirroring some other feedback across the industry, we are seeing a greater level of







Summary of US corn silage		Mycotoxin concentrations (ppb), occurrence (%) and total risk (REQ) for selected samples			
	Mycotoxin group	Average	Maximum	Occurrence	
 <b>30/08/2023 to 24/10/2023</b> Sample data range   <b>5.4</b> Average mycotoxins per sample   <b>96%</b> Samples with 2 or more mycotoxins	Fusaric acid	317.1	2,388	94.1	
	Type B Trichothecenes	1,167	29,853	84	
	Emerging mycotoxins	71.2	987	72.8	
	Fumonisin <sub>s</sub>	1,101	44,744	49.7	
	Type A trichothecenes	12.7	283	24.3	
	Zearalenone	35.9	1,171	23.1	
	Other Aspergillus mycotoxins	0.3	18	3.6	
	<b>REQ for dairy cows</b>	<b>136.9</b>	<b>2,359</b>		
	Percent of samples at lower, moderate or higher risk REQ for dairy cows	Higher	27.8%		Lower
		Moderate	20.7%		

Table 2. Preliminary 2023 Harvest Analysis data, a summary of United States corn silage for dairy cows, detailing mycotoxin concentrations (ppb), occurrence (%) and total risk (REQ) for selected samples.

fumonisin<sub>s</sub> compared to previous years. Indications so far show a moderate to higher risk across all samples.

#### Empowering Predictive Insights with Wageningen University

The ability to predict mycotoxins during the growing season was another key theme that emerged at the World Mycotoxin Forum.

On April 1, 2023, a four-year project started with the aim of developing an early warning system regarding the presence of mycotoxins in cereal grains in Europe. A consortium led by Wageningen University will play a significant role in improving predictive capabilities related to mycotoxin risk. Using advanced technologies such as AI and machine learning, this initiative, in

which Alltech is participating, aims to enhance predictive models for crop quality and mycotoxin occurrence.

This collaboration puts the industry on a better trajectory to anticipate and mitigate risks, further empowering producers to make proactive decisions in response to changing climate patterns and mycotoxin risk.

#### Looking Ahead

The diverse weather challenges of 2023 underscore the need for accurate insights such as those provided by the Alltech Harvest Analysis program. Although these regional assessments provide a strong representation of mycotoxin risk across key feed ingredients, the best way to understand potential contamination in the ingredients or feeds you are using in your business is to routinely carry out mycotoxin testing. Armed with the results, you can then make the most informed mycotoxin control decisions.

As testing continues over the coming weeks, the complete 2023 Alltech Harvest Analysis reports will be made available. To sign up to receive your region's report and to learn more about the program, please visit our Harvest Analysis webpage.



#### Chloe Chisholm

Chloe Chisholm attended the University of Brighton where she earned a first-class honours degree in English language and literature. Following her graduation, Chloe pursued a job as a marketing professional where she grew her skills in the digital and creative space. This journey led her to relocate to Stamford, Lincolnshire after accepting the position of Digital Marketing Specialist on the Alltech Mycotoxin Management Team. In this role, Chloe supports the digital activities of the mycotoxin side of Alltech's business.