TotalTox™

BETTER FEED MILL INGREDIENT QUALITY RISK MANAGEMENT

New Tools Enable Better Feed Mill Ingredient Quality Risk Management and Deliver the Unexpected Benefit of Boosting Plant Productivity

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SYNOPSIS

2020 has presented an incredibly complex set of challenges with multiple new risks facing Feed Mill Quality Managers. The silver lining is that solutions such as TotalTox from EnviroLogix can solve for some of these challenges and come with the benefits of boosting plant productivity.

TotalTox™

Introducing TotalTox™ to Feed Mills

November 2020

New Tools Enable Better Feed Mill Ingredient Quality Risk Management and Deliver the Unexpected Benefit of Boosting Plant Productivity

Managing Ingredient Quality is Key to Feed Mill Productivity

Production rate and feed quality are the two major drivers of finished feed costs. At full production, ingredient costs may account for 70 to 90% of the cost of producing feeds.

Therefore, managing ingredient quality is very important to ensuring high feed mill productivity. To control variability in feed ingredient quality, the feed mill must have a robust QA/QC policy that describes what, when, and how to measure ingredient quality. On-site measurement of bulk ingredients at the point of delivery enables the feed mill to segregate low quality ingredients and appropriately re-formulate to produce finished feeds that meet customer and regulatory requirements.

Figure 1

The individual test strips on the TotalTox™ comb are connected through a common backing, simplifying handling and speeding up testing. Since the TotalTox™ tests for aflatoxin, DON, fumonisin, and zearalenone share the same protocol for corn testing, screening for multiple mycotoxins is quick and minimizes chances for operator error. A beta version of the comb is currently available worldwide. The final market version (pictured above) is expected to be available in Q4 of 2020.

Ingredient Quality is Best Managed at the Point of Delivery

Rapid tests exist to measure nutritional content and natural toxins such as mycotoxins at the point of delivery. For mycotoxins, co-occurrence in crop commodities and processing co-products is on the rise and mycotoxin test kit providers have responded by making kits available that can test the same sample extract, which allows the feed mill to process trucks at a faster rate and comprehensively manage

mycotoxin risk. These quantitative mycotoxin tests are inserted into a reader device that digitizes the results and makes the data available for analysis and distribution.

A best-in-class QA program will have an ingredient rejection policy that specifies the analytical values that trigger a rejection, how to document a quality report, how to send a sample to a laboratory for confirmatory testing, how to save a sample in the event of a dispute, and how to communicate the rejection with the supplier. Furthermore, all quality reports should be internally retained in a supplier history file to monitor supplier consistency and identify trends in performance. Videos for each of these features can be seen on this QuickScan Software features page.

Point of Delivery Mycotoxin Test Solutions Enable Upstream Quality Management

To manage mycotoxin quality at the point of delivery, the testing solution needs to:

- Be fast and accurate
- Be easy to use
- Be capable of providing results for multiple mycotoxin types
- Enable supplier management
- Enable risk management business decisions

There are several providers of on-site mycotoxin solutions, but EnviroLogix is the clear product leader. EnviroLogix was the first company to develop and commercialize lateral flow technology for on site mycotoxin testing and they have continued to improve the technology for decades, culminating in the 2020 launch of TotalTox™ mycotoxin tests.

TotalTox™ tests are read on the QuickScan™ System all at once; results are captured in data logs and PDF reports, providing source traceability. TotalTox™ mycotoxin tests offer a combination of accuracy, speed, and protocol simplicity for testing multiple mycotoxins that is truly a breakthrough compared to market alternatives. TotalTox™ tests were developed for feed mills to improve their mycotoxin risk management capabilities while simultaneously increasing their mycotoxin testing operational efficiency. TotalTox™ mycotoxin tests for aflatoxin, DON (vomitoxin), fumonisin and zearalenone are currently available as single strip kits or in the TotalTox™ comb format (**Figure 1**). TotalTox™ tests provide fast time to results by using a common, water-based extraction, sample dilution, and run time protocol. Furthermore, the entire TotalTox™ comb fits into the QuickScan™ system for simultaneous data capture and result reporting. Results are fully exportable as the QuickScan can connect to the internet, local networks, and laboratory information management systems (LIMS).

Not only do TotalTox™ kits deliver the fastest results using a common water-based extraction, but the kits also have certified performance. Unlike alternative solutions, the TotalTox™ kits are FGIS-AMS (formerly GIPSA) certified (TotalTox™ Zearalenone certification is pending). Furthermore, for feed mills producing Non GMO feed, the QuickScan™ System also reads GMO tests. The GMO tests and TotalTox™ tests can be read simultaneously on the QuickScan™ System with results documented on the same report.

The QuickScan point of delivery testing platform enables data driven risk management for test plan cost optimization. TotalTox™ tests enhance the benefits of the QuickScan™ system. By testing for multiple mycotoxins and utilizing the trend analysis functions unique to the QuickScan™ system, one can make data informed decisions on what toxins to test for based on regional risks and what suppliers to closely monitor based on historical delivery quality.

TotalTox™ tests on the QuickScan™ system are changing, the paradigm of mycotoxin risk management from a traditionally reactionary program to a data-driven proactive program. Instead of waiting for lab results from composite samples or processed materials, mycotoxin contamination can be assessed on-site, truck by truck, at the start of harvest.

Toxin trends can be charted by type and supplier using the data management capabilities of the QuickScan system (**figure 2**). By assessing total mycotoxin quality upstream and early in the harvest, the testing plan for the remainder of the harvest can be optimized to reduce the cost of testing while lowering the risk of sourcing unsuitable corn.

The QuickScan™ System possesses many value-adding features that enable better business decisions such as: on-board data plus reporting, data analysis, network connectivity plus export options, user plus machine quality checks, test kit inventory plus replenishment management, custom cutoffs, and automatic associations. These software features make managing quality, ingredient suppliers, and test kit inventory simple and fast.

Furthermore, the QuickScan™ System makes it easy to comply with the stringent recordkeeping requirements of the Food Safety Modernization Act (FSMA). Specifically, the FSMA record keeping requirements state that original values for hazard analysis (e.g., mycotoxins) must be retained for two years and should the FDA request records, the records must be produced within 24 hours. The QuickScan™ System can store up to 100,000 quality reports on-board in a digital format therefore making data retrieval fast if the FDA should request records.

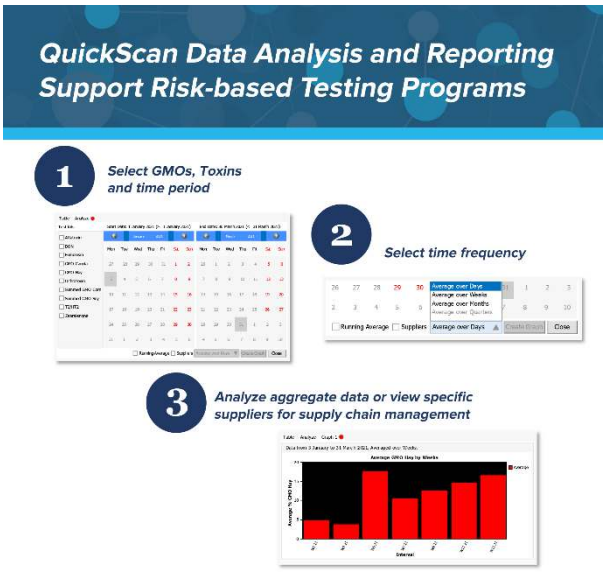

Figure 2

The QuickScan supports on-board trend analysis that enables data driven risk management. Data are sliced by toxin type and supplier to isolate risk and testing can be performed where needed the most.

The EnviroLogix Point of Delivery Mycotoxin Testing Solution Enables Finished Feed Quality Management and Maximizes Feed Mill Margins

To maximize productivity at a feed mill, the plant needs to run constantly while producing high quality feed that meets customer and regulatory requirements. The feed mill requires a constant inflow of ingredient deliveries and outflow of finished feed. To ensure high quality finished feed products, ingredients should be screened at the point of delivery for quality.

Figure 3

Feed mill quality management and business needs are uniquely met by the TotalTox Solution.

Business Needs	Test and Platform Requirement	TotalTox Solution
Testing Efficiency • Trucks or samples per day	**Fast time to result**	<10 minutes for testing four toxins (aflatoxin, DON, fumonisin, zearalenone) from sample prep to results report
Labor Productivity • Errors per week • New hire training	**Common and simple protocol**	Aflatoxin, DON, Fumonisin, Zearalenone have: • 1 extract • 1 dilution • 1 run time • 1 read
Customer and Regulatory Mycotoxin Requirements	**Certified test result accuracy**	Kits and readers are AMS-GFIS (formerly GIPSA) and AOAC certified
Improved Margin • Segregation • Docking for low quality • Proper binder dosage • Mycotoxin risk management optimization	**Reader platform with data management features**	QuickScan System reads mycotoxins and GMO tests simultaneously Business Intelligence Software: • Assay and supplier trend tracking • Custom cutoffs • Data log and report logs
3rd Party Certification, Regulatory Audit Compliance • Safe Feed Safe Food • FSMA • The Non-GMO Project		

Upstream quality management of mycotoxins is best achieved with a comprehensive screening tool that is fast and easy to use; and produces information that can be used as an input to the quality management system for cost and quality optimization. The EnviroLogix TotalTox™ mycotoxin tests are uniquely capable of meeting the business needs of the feed mill quality management system (figure 3). For a best in class quality management system we recommend using the best in class mycotoxin testing solution – TotalTox™ mycotoxin tests by EnviroLogix.