SHIMADZU

Excellence in Science

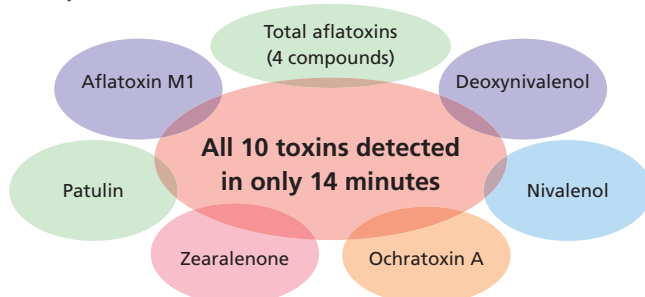# Mycotoxin Screening System

i-Series Solution Package

Nexera-i

EU Criteria Concentrations of 10 Mycotoxin Components Detected with High Sensitivity in Only 14 Minutes

Mycotoxin (mold toxin) is a generic term for metabolites produced by molds on food products that are hazardous to human and animal health. To improve food safety, food processors have been inspecting ingredients for the presence of such mycotoxins. In only 14 minutes, this mycotoxin screening system is able to detect the presence of 10 mycotoxin components with high sensitivity at concentration levels specified by EU standards, which are the strictest in the world. Furthermore, because the system does not involve a sample derivatization process, samples can be measured much more efficiently.

Three Key Features

- Detects mycotoxins with high sensitivity at criteria concentrations specified by EU standards, which are the strictest standards in the world.
- Rapid screening detects the 10 components in only 14 minutes.
- Screening results and reports are available immediately after each analysis is finished.

Total aflatoxins (4 compounds)

Aflatoxin M1

Deoxynivalenol

All 10 toxins detected in only 14 minutes

Patulin

Nivalenol

Zearalenone

Ochratoxin A

Criteria Values for Respective Standards*[1]

Mycotoxin	High-Risk Foods	EU	Codex	Japan
Aflatoxins B1, B2, G1, and G2	Grains (wheat, etc.)	Total 4 to 15 µg/kg AFB1 2 to 12 µg/kg	Total 10 to 15 µg/kg	Total 10 µg/kg
Aflatoxin M1	Milk	0.05 µg/kg	0.5 µg/kg	0.5 µg/kg
Ochratoxin A	Wheat, etc.	2 to 10 µg/kg	5 µg/kg	Not specified
Patulin	Apples	25 to 50 µg/kg	50 µg/kg	50 µg/kg
Deoxynivalenol	Wheat	500 to 1750 µg/kg	1000 µg/kg	1100 µg/kg (tentative criteria value)
Nivalenol	Wheat	Not specified		
Zearalenone	Grains	20 to 400 µg/kg (2 to 3 mg/kg in feed)	Not specified	Not specified (1 mg/kg in feed)

*1: Excluding foods intended for infants
For more details, see the precautions indicated below.

Ready to Use - Measure Samples Immediately After Switching the System ON

This system is designed for rapid screening for 10 mycotoxin components in grain products, such as wheat and rice flours, apples, and milk. Using the provided kit, which includes a column and CD-ROM, containing optimized pretreatment methods that minimize effects from contaminant components and analytical parameters for regulated components, sample measurements can be started immediately.

In addition to the above screening kit and Nexera-i system, standard samples for the regulated components, pretreatment cartridges, and mobile phases are also required.
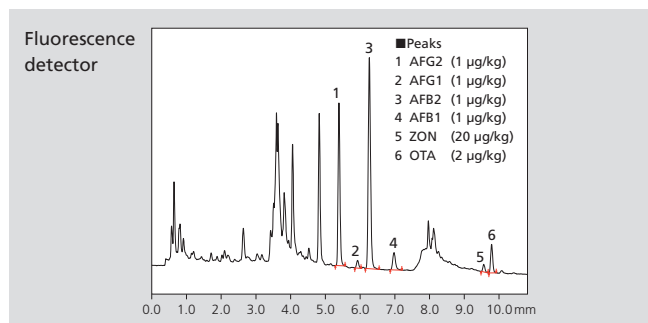
Pretreatment

Analysis and data acquisition

Detect EU Criteria Concentrations of Mycotoxins with High Sensitivity

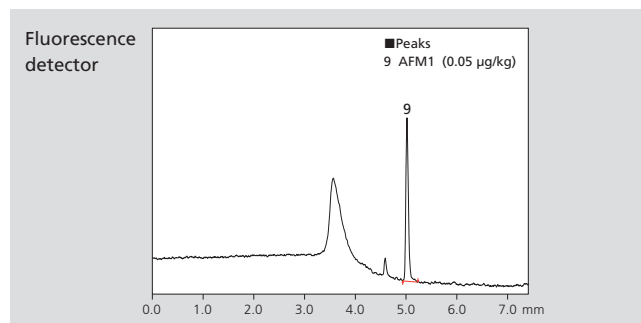## Aflatoxins Detectable Directly without Fluorescent Derivatization

By using the i-Series built-in PDA detector with an RF-20Axs fluorescence detector, which offers the highest sensitivity levels in the world, the system can detect aflatoxins at concentration levels specified as criteria values[*2] in EU directives, without using fluorescent derivatization. The instruction manual provided with the system includes pretreatment methods optimized for target samples, which are grains (soft wheat and rice flours), milk, and apples. The troubleshooting section includes key considerations for each process step, from extraction to acquisition, which helps ensure that reliable data can be acquired even when analyzing samples for the first time.
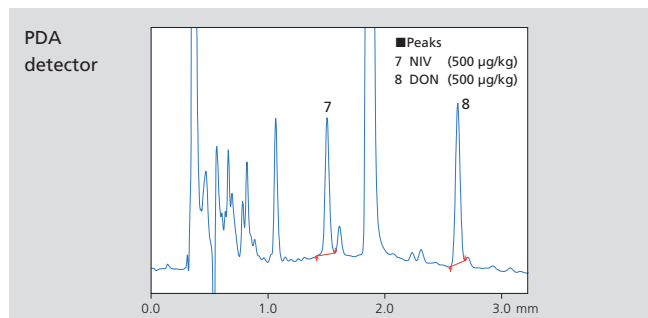
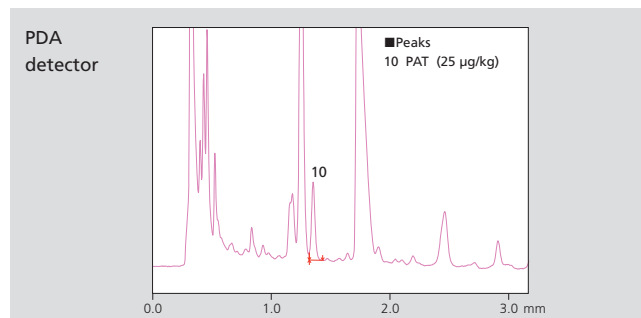*2: Excluding foods intended for infants

Grain (Soft Wheat Flour)

Fluorescence detector

■Peaks
1 AFG2 (1 µg/kg)
2 AFG1 (1 µg/kg)
3 AFB2 (1 µg/kg)
4 AFB1 (1 µg/kg)
5 ZON (20 µg/kg)
6 OTA (2 µg/kg)

Milk

Fluorescence detector

■Peaks
9 AFM1 (0.05 µg/kg)

Grain (Soft Wheat Flour)

PDA detector

■Peaks
7 NIV (500 µg/kg)
8 DON (500 µg/kg)

Apples

PDA detector

■Peaks
10 PAT (25 µg/kg)

All added mycotoxin concentrations are converted for foods.

Screening Results and Reports Are Available Immediately After Analysis Is Finished

Quickly Confirm Screening Results in the Data Browser Window

Multiple chromatograms and automatically calculated quantitative results can be confirmed in the same window by simply dragging acquired data to the Data Browser. Pass/fail results for criteria values can also be displayed at the same time, making it easy to understand test results at a glance.

Drag data

Fluorescence chromatogram

PDA chromatogram

Data Analysis

Determine Pass/Fail Results Quickly for Large Amounts of Data and Perform More Complicated Statistical Analysis

Measurement results for each sample can be automatically included in individual quantitative reports prepared for each sample or in a summary report or output in PDF format. Using the optional multi-data report function*³ can significantly improve visualizing massive amounts of sample data. Pass/fail results for multiple samples can be output in a table, so that samples that fail the criteria can be identified at a glance, even for large numbers of samples. In addition, a series of quantitative results can be automatically output as an Excel file, so that the data can be graphed or used for more sophisticated statistical processing, which offers powerful support for medium and long-term data management.

*3: An optional license is required to use the multi-data report function.

Screening Judgment Report

XR Control Chart

Mycotoxin Screening System

i-Series Solution Package

Preventing the Loss of Data Integrity Due to Alteration or Replacement of Data

The LabSolutions report set function resolves important issues faced by analytical laboratories, such as preventing data alteration due to intentional or unintentional operating errors, and ensures data integrity. In addition to the extensive security functions provided in previous versions, LabSolutions report sets in DB and CS versions of LabSolutions achieve the visibility of software operations. The report set function also serves as a useful tool for addressing concerns that were difficult to resolve using previous reports that were printed out (such as alternation or replacement of data within reports).
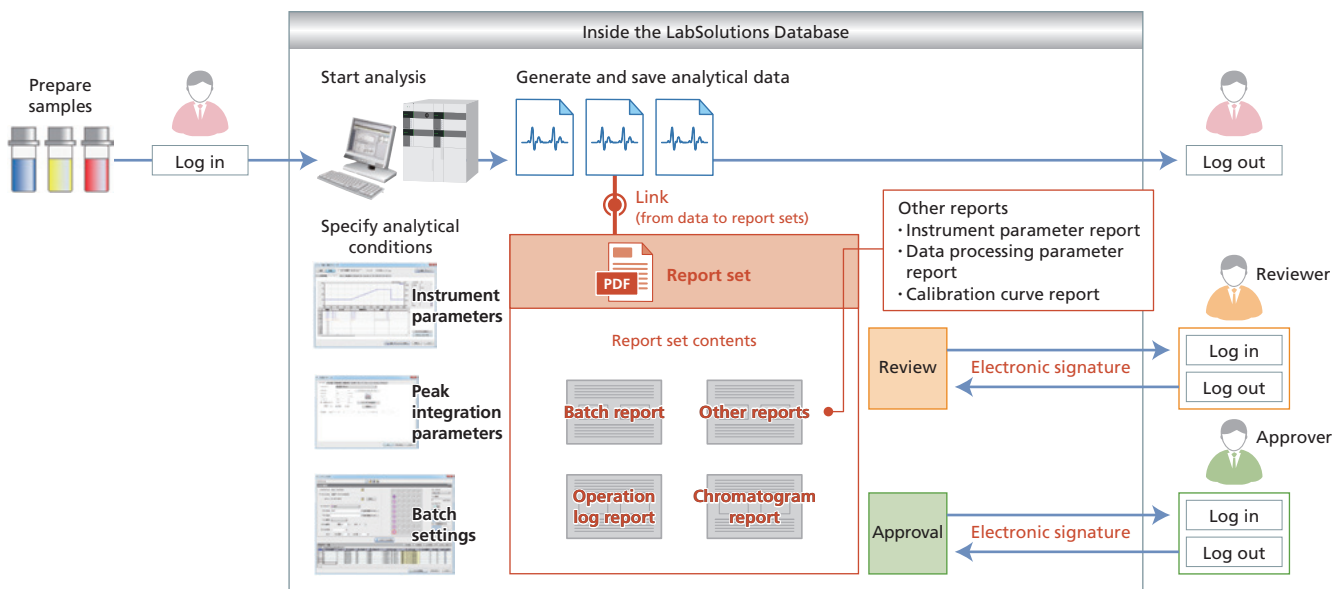
Precautions

1. The mycotoxin screening kit provides unmodified information and other content obtained by Shimadzu for applications involving screening for mycotoxins in grains (soft wheat and rice flours), milk, and apples. Therefore, it is not recommended for other applications.
2. Customers should use results obtained using the kit based on their own judgment.
3. Indicated criteria values were obtained from the following laws and regulations.
   - Commission Regulation (EC) No 1881/2006 of 19 December 2006
   - Commission Regulation (EU) No 165/2010 of 26 February 2010
   - Codex Standard 193-1995
   - Distribution of the report of the ninth session of the codex committee on contaminants in foods (REP15/CF)
   - Handling foods that contain aflatoxins (Notification No. 0331-5 of Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare of Japan, March 31, 2011)
   - Method for testing total aflatoxins (Notification No. 0816-1 of Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare of Japan, August 16, 2011)
   - Handling milk that contains aflatoxin M1 (Notification No. 0723-1 of Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare of Japan, July 23, 2015)
   - Method for testing aflatoxin M1 in milk (Notification No. 0723-6 of Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare of Japan, July 23, 2015)
   - Setting tentative criteria values for deoxynivalenol in wheat (Notification No. 0521001 of Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare of Japan, May 21, 2002)
   - Partial revision of ministerial ordinance on milk and milk products concerning compositional standards, etc. and standards and regulations of foods, food additives, etc. (Notification No. 1126001 of Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare of Japan, November 26, 2003)