Complete Automation in Mycotoxin Analysis:

significant cost reduction

SOLUTIONS BY **LC Tech**

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Complete Automation for the Analysis of Aflatoxins (B1, B2, G1, and G2) and Ochratoxin A.

The basis for automation is the new FREESTYLE robotic system.

FREESTYLE is not only a way of life, but also stands for flexibility, spontaneity and adaptability. Technically, the FREESTYLE system is a tested XYZ-robot that can be adapted to the growing or changing requirements within laboratory routines by choosing the appropriate module.

Spontaneous, flexible, unique.

The underlying technology of the FREESTYLE system appears similar to that of the other systems and yet is totally different. FREESTYLE is made unique through its flexible adaptation to particular laboratory requirements at any one time. The user decides how to design components, for example, the FREESTYLE "platform". A spontaneous change of application is possible at any time and is selected via the software: e.g. the use of different sample containers or activation of different modules– even within a sequence.

Configuration for high-throughput automation.

The FREESTYLE system is combined with an SPE module and a ThermELUTE module. In this configuration, the convenient SMART immunoaffinity columns are processed fully automatically in a very short period of time. The sample is directly eluted into an HPLC sample loop. Losses through evaporation or adsorption effects (e.g. with aflatoxins) are thereby avoided.

FREESTYLE SPE and ThermELUTE Module (HPLC not shown)

Complete Automation with High Throughput and 14-fold Increase in Sensitivity.

The FREESTYLE SPE with ThermELUTE and SMART columns are the fundamental building blocks for complete automation. No other device offers such a great reduction of the work load with simultaneous increase of performed analyses.

Automatic Sample Processing.
From the filtered and diluted crude extract to the finished chromatogram without any manual intermediate steps: all within the scope of FREESTYLE ThermELUTE in combination with an HPLC!

The FREESTYLE ThermELUTE is connected with a standard HPLC (quaternary pump, fluorescence detector, UVE for post-column derivatisation of aflatoxins) or with an LC-MS via an interface.
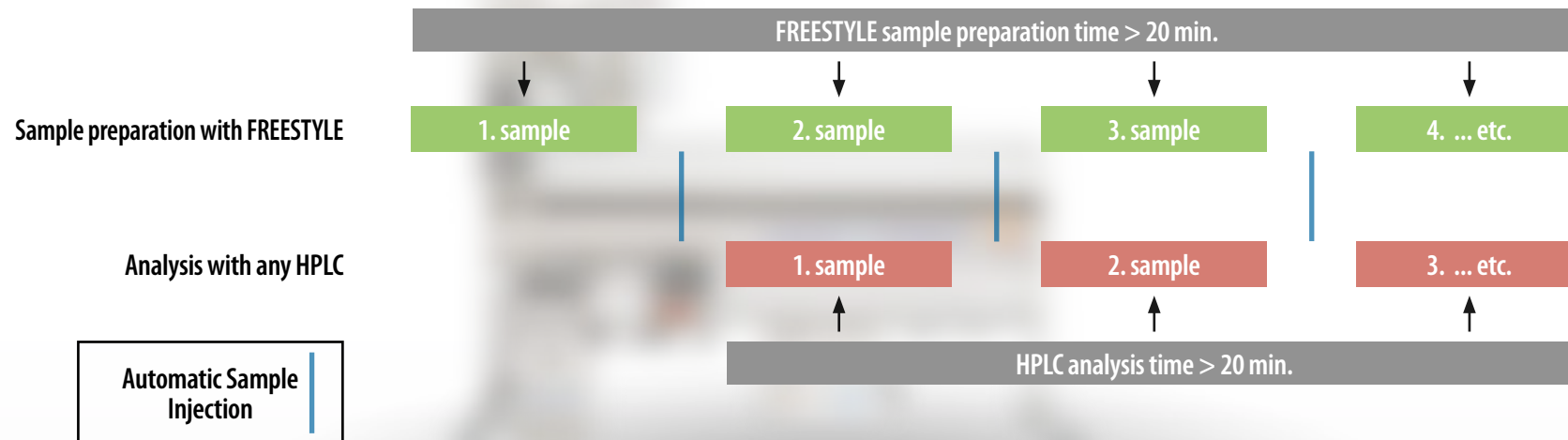
Sample Preparation and Analysis: parallel are faster.

> 70 SAMPLES PER DAY

The Method.

The extracted, diluted and filtered sample is loaded onto the high-performance SMART column (AflaCLEAN SMART or OtaCLEAN SMART) via the FREESTYLE robotic system. After rinsing, the column is heated to break the bond between toxin and antibody. The sample is then directly eluted into the HPLC sample loop as partial filling with a large volume of water. The injection valve switches, the sample is loaded onto the column, the analytes are separated, then derivatised (aflatoxin B1, G1) and detected in a fluorescence detector.

FREESTYLE sample preparation time > 20 min.			

Sample preparation with FREESTYLE

1. sample	2. sample	3. sample	4. ... etc.

Analysis with any HPLC

1. sample	2. sample	3. ... etc.

Automatic Sample Injection

HPLC analysis time > 20 min.		

The FREESTYLE conducts the sample processing, whilst the HPLC analyses the previously processed sample at the same time. This happens fully automatically and round the clock. In that way, the throughput of analyses can be increased to over 70 samples per day. Everything without manual intervention.

# PPT not PPB: So sensitive that you now can see what you couldn't see before.

Even the lowest concentrations become visible.
The high system sensitivity enables the smallest trace of mycotoxins to be detected. In particular when examining baby food, the FREESTYLE ThermELUTE provides a high level of assurance and an overview of the actually present contaminations.

Significant Increase in Sensitivity.
Through direct injection/elution from the column into the HPLC sample loop, an **extreme increase in sensitivity** can be achieved. A quantitative detection in the region of less than 10 ppt as sum parameter for aflatoxins and 30 ppt for ochratoxin A can be achieved with a modern fluorescence detector.
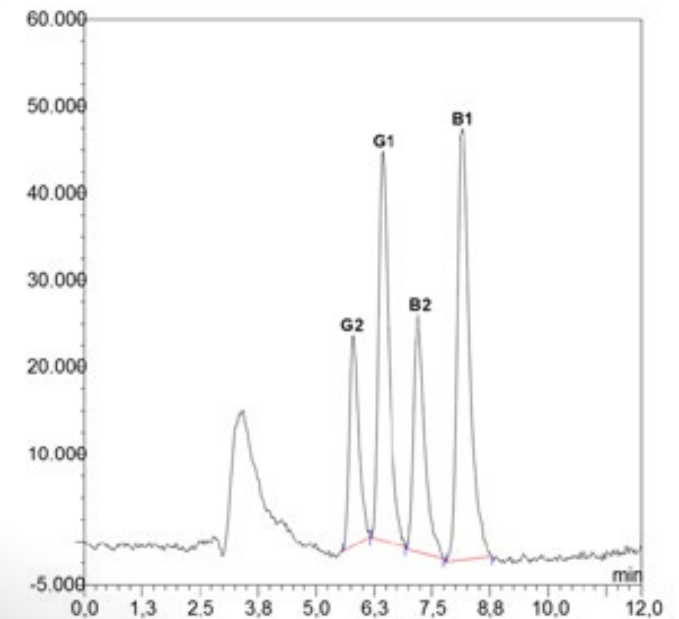
Chromatogram of an aflatoxin sample contaminated with 100 ppt total toxin (40 ppt aflatoxin B1 and G1, 10 ppt aflatoxin B2 and G2), resolution and measuring sensitivity allow for a very precise quantification < 10 ppt total toxin.
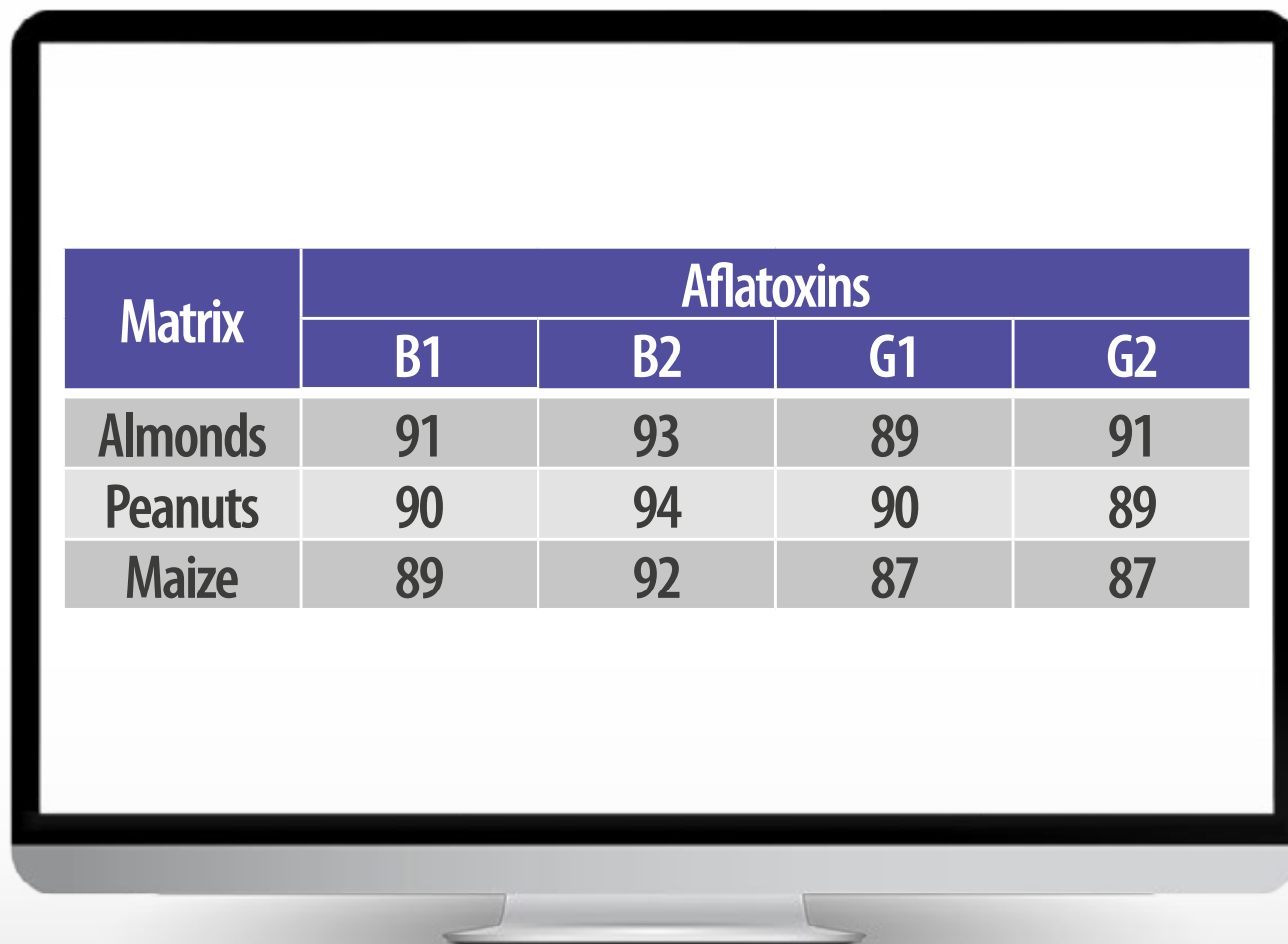
Excellent Recoveries for Various Matrices.

Summary.

Without the need for complex technical equipment, very good results can be achieved in combination with the SMART columns. Through comprehensive automation, **from crude extract to chromatogram** without manual intermediate steps, the following four main parameters can be optimised:
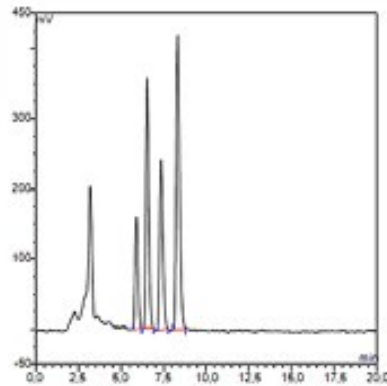
1. Excellent recovery rates
2. Incredible sensitivity in the lower ppt-region
3. High sample throughput > 70 samples /day
4. Automation for round-the-clock sample processing

Matrix	Aflatoxins			
	B1	B2	G1	G2
Almonds	91	93	89	91
Peanuts	90	94	90	89
Maize	89	92	87	87

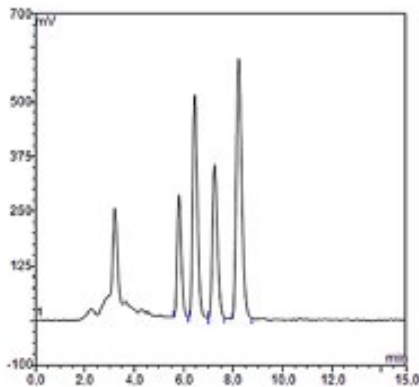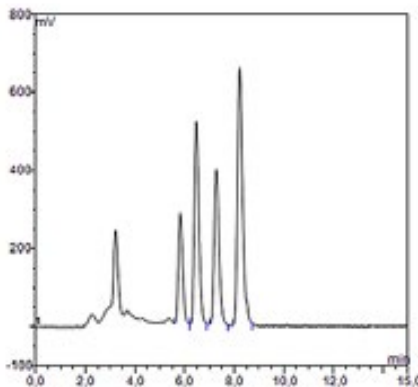# Excellent results for all regulated matrices.

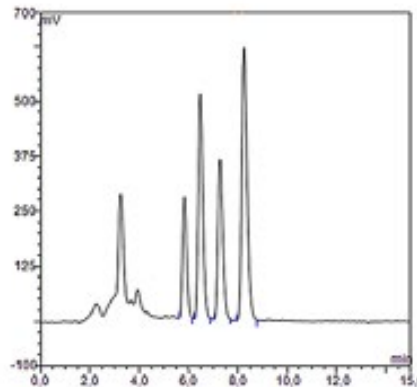
Standard
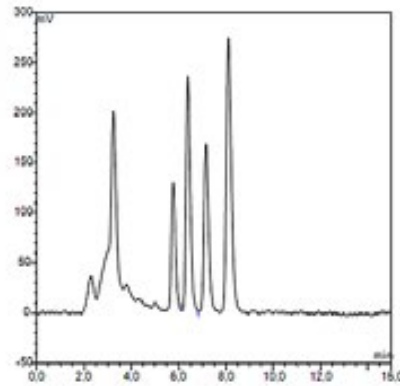
Nutmeg
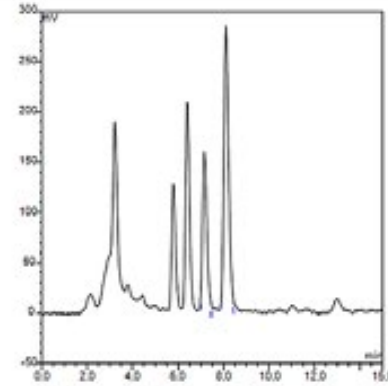
Coriander
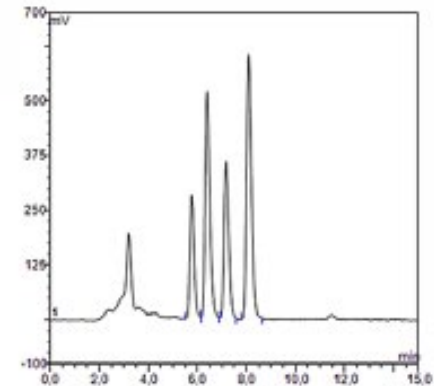
Maize

Comparable and easily interpretable chromatograms regardless of the matrix.
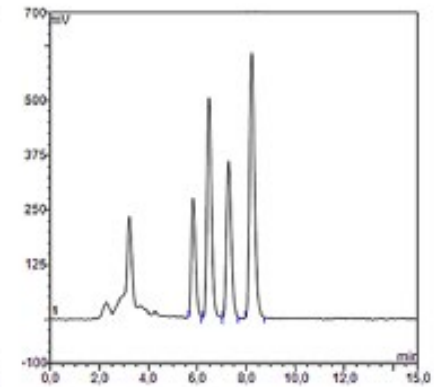
Hazelnut

Peanut

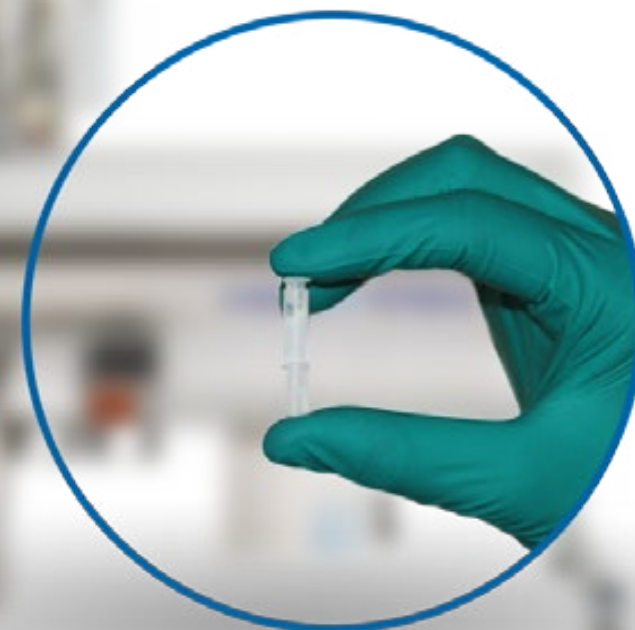Raisins

Pistachios

Small Column –
Great Performance.

SMART columns — small, but hold the key for high throughput in the analysis of aflatoxin B1, B2, G1 and G2 or ochratoxin A in food and animal feed.

The small SMART columns **AflaCLEAN SMART & OtaCLEAN SMART** have been developed to replace the standard 1 ml and 3 mL immunoaffinity columns. Normally the user uses only one aliquot of the purified sample for injection into the analytical device, but still needs to spend enormous amounts of time and solvents for the sample preparation. With the SMART columns, however, up to 80 % of solvents and time can be saved compared to the conventional processing protocols. Nonetheless, performance has not been compromised; with a loading capacity of 100 mg aflatoxin B1 or ochratoxin A, the columns are AOAC-compliant.

Find out more about the advantages for manual application on our website under:

Two to Impress.

The true strength of this column, however, is revealed when used in combination with the FREESTYLE ThermELUTE. The entire elution volume is directly injected into the sample loop as partial filling without intermediate steps such as evaporation or solvent exchange. The results in your laboratory routine will impress you.

Contact
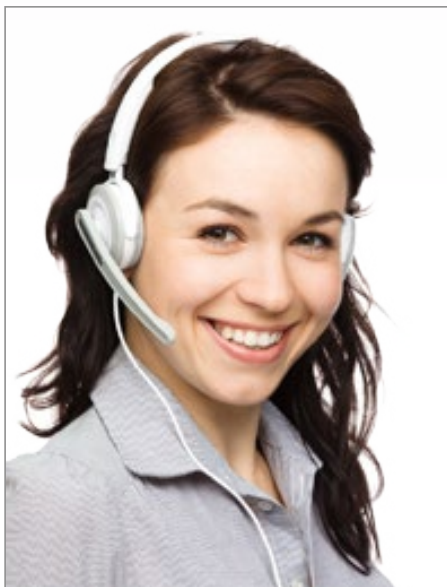
We are looking forward to receiving your phone call!

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