Multi-Mycotoxin-Analysis
From nut samples

Mycotoxin-related product recalls can only be avoided through close monitoring within the food processing industry. The prevalence and frequency of aflatoxins but also of ochratoxin A in nuts and nut products pose a particular challenge for analytics: the maximum tolerated limits are low due to the toxicity. Efficient clean-up by means of immunoaffinity columns is the current standard, but it is only suitable for multi-mycotoxin analysis to a limited extent. Here, the new SPE-based clean-up from LCTech offers new possibilities, even for challenging matrices such as nuts, which have a high fat content.

The CrossTOX® column is the ideal solution for optimal quality monitoring, even in the case of low mycotoxin contamination or in the case of strong inhomogeneity of the mycotoxin contamination caused by so-called hot-spots, which cannot be shown with the usual analysis. At the same time, quantification is usually possible without internal standards and significantly less contamination is visible in LC-MS/MS due to matrix residues.

Product-Highlight

CrossTOX® for a clean sample! The depletion of matrix interferences enables multi-mycotoxin-analysis:

- High matrix compatibility (applicable for cereals, nuts, dried fruits)
- Excellent recoveries
- Fast sample processing, thanks to an universal extraction protocol
- Reduction of maintenance costs (standards and cleaning of analytics)

Everything with one column

CrossTOX® Columns

AFB1, AFB2, AFG1, AFG2; OTA; STC; FB1, FB2; ZON; DON; NIV; 15-A-DON; 3-A-DON; DON-3-GLC; T2; H-T2; CIT; DAS

Processing Protocol

20 g of the homogenised matrix are mixed with an extraction agent (94 % acetonitrile, 15 % HPLC water, 1 % acetic acid) and extracted for a sufficiently long time (3 - 5 minutes in blender or Ultraturrax). The suspended matter can be filtered or efficiently separated by centrifugation (3000 x g, 5 minutes). A maximum of 3 mL of the clear extract is passed through the CrossTOX® and collected in a GC vial-ready! The sample can be measured directly.

Analytic: UPLC column Accucore Biphenyl 100 mm x 2.1 mm; 2.6 µm with Defender Guard; column temperature 38 °C.
LC flux A: 98/2 (v/v) water/methanol + 1 % acetic acid + 5 mM ammonium acetate.
LC flux B: 98/2 (v/v) methanol/water + 1 % acetic acid + 5 mM ammonium acetate; flow rate 0.4 mL/ min. H-ESI mode.

Time (min)	Eluent A (%)	Eluent B (%)	Slope
0 - 2	95	5	5
2 - 5	15	85	5
5 - 11	5	95	5
11 - 13	95	5	5
13 - 16	95	5	5

LCTech

Clean-Up and Recovery in Different Matrices

The flexible use of the CrossTOX® column for different matrices with an universal extraction and sample preparation protocol simplifies the work steps and provides reliable and reproducible results.

By using the non-dispersive CrossTOX® column for sample clean-up, the costs for internal standards can be massively reduced for analytics due to the efficient matrix depletion.

Conclusion

The use of the CrossTOX® column for sample clean-up not only improves sample quality, but also protects the analytical process by purifying and depleting matrix impurities. Best recovery rates and reproducible results enable fast and reliable analysis of nuts and nut-containing matrices. The CrossTOX® column is a helpful tool to ensure multi-mycotoxin analysis even for heterogeneous sample materials (cereals, dried fruits, nuts).

18 Mycotoxins can be quantified reproducibly using LC-MS/MS and the CrossTOX® column. Many of these toxins are measured due to their regulation, but also due to their increased occurrence in the food and feed industry and are used as quality indicators to check product quality and compatibility.

The CrossTOX® columns achieve increased depletion of matrix components due to very high matrix compatibility and allow analytical measurement by LC-MS/MS for a majority of samples following a simple universal extraction protocol.

Toxin	Pistachio	Hazelnut	Almonds	Peanut
AFB1	93	86	87	82
AFB2	98	90	92	99
AFG1	102	104	102	104
AFG2	103	79	95	95
OTA	104	99	102	93
ZEA	83	83	88	91
FB1	105	101	106	100
FB2	102	101	99	99
DON	95	98	95	101
NIV	95	85	96	91
3-Ac-DON	99	85	91	89
15-AC-DON	94	86	89	88
DON-3-GLC	83	97	85	89
HT-2	76	75	81	118
T-2	80	116	83	96
CIT	92	99	101	89
DAS	99	105	105	101
STC	87	95	88	88

Recovery of regulated mycotoxins
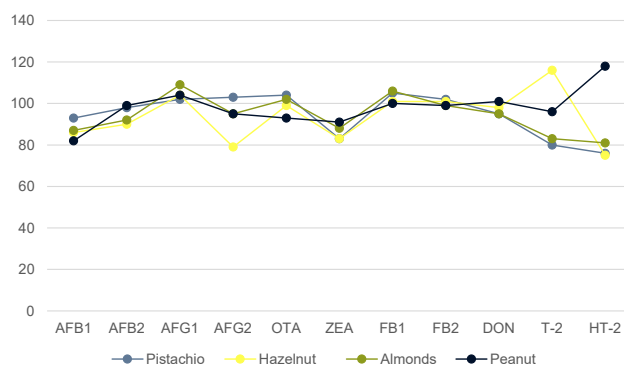
The following *LCTech Product* has been used:

17900	CrossTOX® clean-up column	100 pcs/Pc

Do you have a special request as to which matrix we should test for you?
Contact us by e-mail at: info@LCTech.de