Fully Automated Mycotoxin Analysis From Extract to Chromatogram

at a Sensitivity in the ppt or ppq Level Using not only LC-MS/MS but HPLC-FLD

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Mycotoxin analysis needs time-intensive clean-up or high-end analytical devices, especially if a high sensitivity i.e. for baby food is required. A complete automation using thermal denaturation technology and SMART columns reduces not only method working steps but also time and costs per sample. At the same time a sensitivity in the ppt level is gained in combination with HPLC-FLD.

Method Description for Automated Processing via ThermELUTE™

Samples were extracted with methanol/water (80/20 v/v) and filtered. Fatty or oil containing matrices (e.g. spices) were treated with n-hexane for defatting. The dilution of the sample was done acc. to the extraction and clean-up protocols of the SMART columns (fig. 9). 2.8 – 20 mL of the sample, representing 0.08 – 10 g matrix equivalents, were loaded fully automated via the robotic system FREESTYLE ThermELUTE™ (fig. 1) onto the SMART column (fig. 9) with a max. flow rate of 3 mL/min. After a washing step, in order to remove matrix interferences, the column was eluted via ThermELUTE™ technology for denaturation of the antibodies. The eluate was quantitatively and directly injected into the HPLC-FLD (fig. 2). During the HPLC analysis of the previously prepared sample, FREESTYLE ThermELUTE™ processes the next sample in parallel (fig. 3).

Reproducible Results with FREESTYLE ThermELUTE™

The calibration curve shows a very high linearity and good correlation over a wide measuring range using the immunoaffinity columns AflaCLEAN SMART (fig. 9) processed via FREESTYLE ThermELUTE™. By varying the matrix load, the calibration curve can be used for individual matrices from baby food up to animal feed or human food.

Reduction of Method Steps

Fully Automated via FREESTYLE ThermELUTE™

During the HPLC analysis of the previously prepared sample, FREESTYLE ThermELUTE™ processes the next sample in parallel (fig. 3).

Conclusion

FREESTYLE ThermELUTE™ enables a complete automation from raw extract to chromatogram. No other system shows a comparable reduction of workload, applicative flexibility, and sensitivity at trace levels, respectively (fig. 4). Without any time consuming manual sample preparation steps e.g. evaporation of the samples, the required maximum levels for baby food are measured and monitored with best recoveries and excellent performance specifications (fig. 4-8).