

Accomplishment of the EU regulations 2017/644-771 for PCDD/Fs and PCBs in food by using a novel triple-quadrupole MS generation

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In 2014, European Regulations laying down methods of sampling and analysis for the EU official control of levels of polychlorodibenzo-p-dioxins (PCDDs), polychloro-dibenzofurans (PCDFs), dioxin-like (DL) and non-dioxin-like (NDL) PCBs in food and feed have been amended by EU Regulations No 589/2014 [1] and 709/2014 [2]. As a direct consequence, based on validations studies [3], gas chromatography (GC) coupled to triple quadrupole mass spectrometry (GC-QqQ MS/MS) was recognized as a confirmatory tool for checking compliance with maximum levels (ML) following specific analytical criteria [4]. Later EU Commission Regulations 2017/644-771 [5-6] further confirmed the use of GC-QqQ MS/MS and a significant number of laboratories have nowadays implemented QqQ approaches to replace, or in parallel to, their classical high resolution (HR)MS approaches based on the use of sector instruments.

In this study, the performance of a novel triple quadrupole GC-QqQ MS/MS system equipped with a programmable temperature vaporization (PTV) injector was evaluated for the analysis of PCDD/Fs and PCBs in food and feed. The MS analyzer was equipped with a titanium ionization chamber and a new short collision cell capable to accumulate and eject ions by means of very narrow pulses that allow to minimize the noise and to adapt accumulation times for sensitive selected reaction monitoring (SRM). The analytical capability of the system was confronted by the strict requirements set by the EU Regulation for a range of standards, quality control (QC) and food/feed samples and compared with a routine GC-HRMS method.

References:

- [1] Commission Regulation (EU) No 589/2014, *Offic. J. Eur. Commun.* 2014, L164: 18-40.
- [2] Commission Regulation (EU) No 709/2014, *Offic. J. Eur. Commun.* 2014, L188: 1-18.
- [3] L'Homme B., Scholl G., Eppe G., Focant J.F., et al. *J. Chromatogr A.* 2015 1376, 149-58.
- [4] Kotz A, Malisch R, Focant JF, Eppe G, et al. *Organohalogen Compd.* 2012, 74: 156-159.
- [5] Commission Regulation (EU) No 2017/344, *Offic. J. Eur. Commun.* 2017, L92: 9-34.
- [6] Commission Regulation (EU) No 2017/771, *Offic. J. Eur. Commun.* 2017, L115: 22-42.