Automated rapid analysis for dioxins and PCBs in food, feedingstuff and environmental matrices

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Introduction

Today there is a need to develop high throughput specific and sensitive methods for the determination of dioxins, dioxin-like PCBs and indicator-PCBs to ensure their rapid and reliable quantification in several kinds of food and feedingstuffs. Ideally one method would fit for several matrices with highest quality standards and with the possibility of a cost/time-effective samplehandling. However, generally in case of the numerous different PCDD/Fs, dioxin-like PCBs and indicator-PCBs as well as the large concentration range to cover this is quite difficult to fulfill. The implementation of an automated sample-treatment flow process ("dioxin street"), which contains an accelerated solvent extraction (ASE)[1-6], a Power-Prep workstation (Fluid Management Systems, FMS)[7-12] for automated clean-up, a Syncore Polyvap (Büchi, Switzerland) for solvent evaporation and a HRGC/HRMS (VG AutoSpec) analysis as detection method for several kinds of different matrices is described here. The aim of the present study is to confirm the high quality, low limits of quantification (LOQ), low PCB background levels[13-16] and reliability of the Power-Prep system in combination with ASE extraction for dioxins, dioxin-like PCBs and indicator-PCBs.

Methods and Materials

All solvents were of high purity (Promochem). Different kinds of samples have been analysed coming from different locations in Europe (see Tables 1-3). Prior to extraction, the samples were fortified with $^{13}C_{12}$-labelled internal standards. Several different sample pre-treatments are described in Table 1. The ASE extractions were carried out on ASE 300 (Dionex, Sunnyvale, CA). All PCDD/F and PCB analyses were performed by HRGC/HRMS and quantification by means