

## TOPIC: Monitoring Tools of Perfluorinated Compounds in Food Chain

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## BIOGRAPHY

**Jacob de Boer** is Professor in Environmental Chemistry and Toxicology and Head of the Dept. Chemistry and Biology of the Institute for Environmental Studies (IVM) at the VU University, Amsterdam, The Netherlands. Since 1 May 2009 he is also deputy director of IVM. In 1998 he won the excellent scientist award of the Wageningen University, The Netherlands. He is a member of the QUASIMEME Scientific Assessment Group, The Marine Chemistry Working Group of the International Council for Exploration of the Sea (ICES), and of the Certification Advisory Panel of the European Institute for Reference Materials and Methods (IRMM). He has coordinated several European Research projects such as DIFFERENCE and DIAC on the development of alternative methods for the analysis of dioxins in food and animal feed, BIOTOX, on alternative methods for the analysis of shellfish toxins, and MATT on the risk assessment of toxaphene. He was involved in many other EU research projects, and he has coordinated many large research projects for other organisations and industries. He has published over 140 peer reviewed articles on the analysis and environmental monitoring of persistent organic pollutants. He has organized many workshops on this topic (e.g. BFR2007 in Amsterdam) and he is a regular invited speaker at international symposia.

Professor De Boer has worked for many years on the environmental contamination of polychlorinated biphenyls (PCBs). More recently he has been heavily involved in studies on brominated flame retardants, perfluorinated compounds and other organic contaminants. He gained a lot of experience in the organisation of international interlaboratory studies on contaminants and on the production of (certified) reference materials for contaminant analysis. He is an advisor for EFSA, UNEP, and various other international organisations. He is a member of the editorial board of *Chemosphere* (Elsevier) and of *CLEAN –Soil, air and water* (Wiley), and was guest-editor of special issues for *Trends in Analytical Chemistry* (2006), *Chemosphere* (2008), *Molecular Nutrition and Food Research* (2008), and *Journal of Chromatography A* (2009), and he is currently supervising eight Ph. D. students.

## ABSTRACT

### Monitoring Perfluorinated Compounds in Food Chain

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In recent years, perfluorinated compounds (PFCs) have received considerable attention from scientists and policy makers. PFCs have been and are still being used widely as surfactants in industrial applications and consumer products. PFCs are persistent and can enter the environment at several stages, e.g. the application to a material, the in-service life and after disposal of a product. PFOS (perfluorooctanesulfonate) and PFOA (perfluorooctanoic acid) are the most well-known PFCs. Other compounds belonging to this class have different chain lengths and/or functional groups [1]. PFOS accumulates in fish, whereas PFOA is more water-soluble. PFCs can also enter food products through contact with packaging materials. In 2008, EFSA has completed a risk assessment on PFOS and PFOA [2]. It was noted that the estimated exposure (60 ng/kg bw/d) was close to the derived TDI (150 ng/kg bw/d). Also, a lack of reliable data on PFCs in food was observed. Interlaboratory studies show improving data, but still a number of analytical issues needs to be solved [3]. The number of relevant PFC compounds is continuously growing. There is an urgent need for good quality certified reference materials. An accurate dietary exposure assessment is not possible without reliable data.

The surfactant type properties of PFCs call for different analytical approaches as compared to other persistent lipophilic contaminants. Fish samples are mostly extracted using medium polar solvents (acetonitrile, methanol), combined with a clean up step using Envicarb [4]. Instrumental analysis is generally performed by HPLC-ESI-MS/MS [1]. Liquid samples like milk and drinking water are generally analysed using solid phase extraction (SPE) [2]. In recent studies methods were developed for PFCs in a wide range of foods [5,6]. These methods rely on KOH digestion of the samples, dilution with water and extraction of the PFCs from the diluted digest by SPE. This enabled the use of higher sample intakes (10 gram) in order to lower the limits of quantification (0.03-0.15 ng/g fresh weight) [6].

Recently, the EU funded project PERFOOD was started. The aims of this project are to develop robust and reliable analytical tools including reference materials for the determination of PFCs in food items, and to use these to (i) qualify and quantify PFCs in the European diet; (ii) understand the transfer of PFCs into food products, and (iii) quantify the contribution of food/beverage contact materials and food and water processing to the overall PFC level in our diet.

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