Risiken erkennen – Gesundheit schützen

Perfluorinated organic compounds in our diet (PERFOOD)

BfR research project, 1 September 2009

Perfluorinated compounds (PFCs) have high thermal and chemical stability and are mainly used in the textile industry for the manufacturing of breathable clothing and in the paper industry to manufacture dirt, fat and water-repellent paper. Because of their specific chemical properties PFCs are classified as long-lived organic contaminants. They are ubiquitous in the environment across the globe. PFCs are toxic for man and animal; they accumulate in the body and in organ tissue and are only excreted slowly. Detection methods that permit reliable statements about overall exposure to PFCs have only been developed in recent years. These compounds mainly reach the environment through the input pathways of industry and municipal sewage treatment plants. A three-year research project supported by the EU with 10 partners from 7 countries aims to characterise the main migration pathways of PFCs to food and the resulting consumer exposure more accurately. BfR is involved in the examination of food packaging and in the calculation of overall consumer exposure to PFCs.

Coordinator
Universiteit van Amsterdam, Netherlands

Project partners
- Stockholms Universitet, Sweden
- Fraunhofer-Gesellschaft zur Förderung der Angewandten Forschung e.V., Germany
- Norsk Institutt for Luftforskning, Norway
- Istituto Superiore di Sanita, Italy
- Vereniging voor christelijk hoger onderwijs wetenschappelijk onderzoek en patientenzorg, Netherlands
- Vysoka Skola Chemicko-Technologicka v Praze, Czech Republic
- Universiteit Antwerpen, Belgium
- Bundesinstitut für Risikobewertung (BfR), Germany
- KWR Water B.V., Netherlands

BfR departments involved:
Department – Safety of Consumer Products, Analytics and Exposure Assessment Unit
Department – Scientific Services, Exposure Assessment and Standardisation Unit

Project term
August 2009-July 2012 (36 months)

Funding agency and amount of support
European Commission through the 7th EU Framework Programme
Total EU: €2,999,432
of which BfR: €133,030

The EU Research Project “Perfluorinated organic compounds in our diet (PERFOOD)” is of major relevance for the Federal Republic of Germany in the context of preventive consumer protection. Anthropogenic perfluorinated compounds (PFCs) are the subject of current political and scientific debate. PFCs are used to render surfaces fat, water- and dirt-repellent. They are chemically inert and are used, for example, in the production of impregnating agents, fire-fighting foams and non-stick coatings. Their specific stability makes them long-lived contaminants in the environment that accumulate in the food chain. PFCs are a novel group of environmental contaminants with physico-chemical and toxicological properties

which differ markedly from other halogenated compounds. This explains why their growing importance was only discovered at a relatively late stage.

The EU PERFOOD project aims to identify the main migration pathways of perfluorinated compounds from the environment and from food production to the food chain, and to examine their contribution to overall exposure. Ten partners from seven European countries are to participate. They will share their expertise in analytics, environmental chemistry, toxicology, food processing and packaging, monitoring, exposure assessment and risk assessment with the consortium.

The objectives are:

- Development and validation of robust, selective and sensitive analytical methods for the identification and quantification of perfluorinated compounds in different food groups

- Qualitative and quantitative considerations of the relevant migration pathways like environmental influences, food technology processes and packagings to estimate overall consumer exposure to perfluorinated compounds from food and the environment.

BfR will be responsible for examining food packagings coated with perfluorinated compounds. The goal of these tests is to produce comprehensive findings on the migration behavior of PFCs in simulant solvents. The first step is to identify the food packagings available on the market by means of corresponding screening and then to quantify them in migration studies. This will generate data using the latest trace analytical methods on the migration of PCFs to food and models will be developed to estimate migration.

The data generated in the project about concentrations in the environment, migration of products and analytical data in the various foods are to be compiled in a suitable manner and taken over into exposure assessment. This involves estimating the intakes by individuals in conjunction with normal consumption. If foods are concerned which are consumed in larger amounts by certain individuals compared with the rest of the population, then this will be taken into account. Modern statistical methods will be used to estimate the intake of PFCs that take into account the distribution and range of concentrations and consumption (probabilistic exposure modeling).