Phthalate levels in food on the Belgian market

by

Van Holderbeke M¹, Servaes K², Geerts L¹, Vanermen G², Fierens T¹, Sioen I³

Aims
Phthalates are widely used as plasticisers in flexible and weak polymer products. Human exposure occurs mainly via food ingestion and can cause a wide range of health and reproductive effects. Phthalates can enter the food chain via environmental contamination or migration from contact materials into food. Our aim is to determine the concentration of phthalates in food on the Belgian market and to explore the various contamination pathways.

Methods
For this purpose, a measurement campaign of phthalates in food has been set up. Four hundred samples of widely consumed foods were purchased in Belgian shops. Brand name, packaging material and properties, shelf life, time and place of purchase, picture and product specific properties (e.g. pH, preserving agent, fat content) were stored in a database. This database was used to explore the contamination pathways by identifying relations between measured concentrations and product properties. Eight phthalates were determined by gas chromatography-mass spectrometry with electron impact ionisation.

Findings
Phthalates are lipophilic, so they tend to concentrate in high-fat food products like butter, margarine, oil and cheese. Concentrations can vary from only a few to hundreds µg/kg food product. Contamination occurs from various sources such as migration from packaging material (including printing inks and glues), contact with plastics during food production and preparation, and transfer via the environment.

Conclusions
Analysis of food samples on the Belgian market shows a wide variety of phthalate concentrations. Combining these results with information on product and packaging properties gives first insights in possible contamination routes.

Keywords
Belgium, Food Analysis, Food Contamination, Food Packaging, phthalate

Acknowledgement
This study was funded by the Federal Public Service of Health, Food Chain Safety and Environment (contract RT/08/1 PHTAL).

¹ VITO, Unit Environmental Risk and Health, Mol, Belgium
² VITO, Unit Environmental Analysis and Technology, Mol, Belgium
³ Ghent University, Department of Public Health, Ghent, Belgium
mirja.vanholderbeke@vito.be