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ARTICLE *in* CHEMOSPHERE · MAY 2008

Impact Factor: 3.5 · DOI: 10.1016/j.chemosphere.2006.12.105 · Source: PubMed

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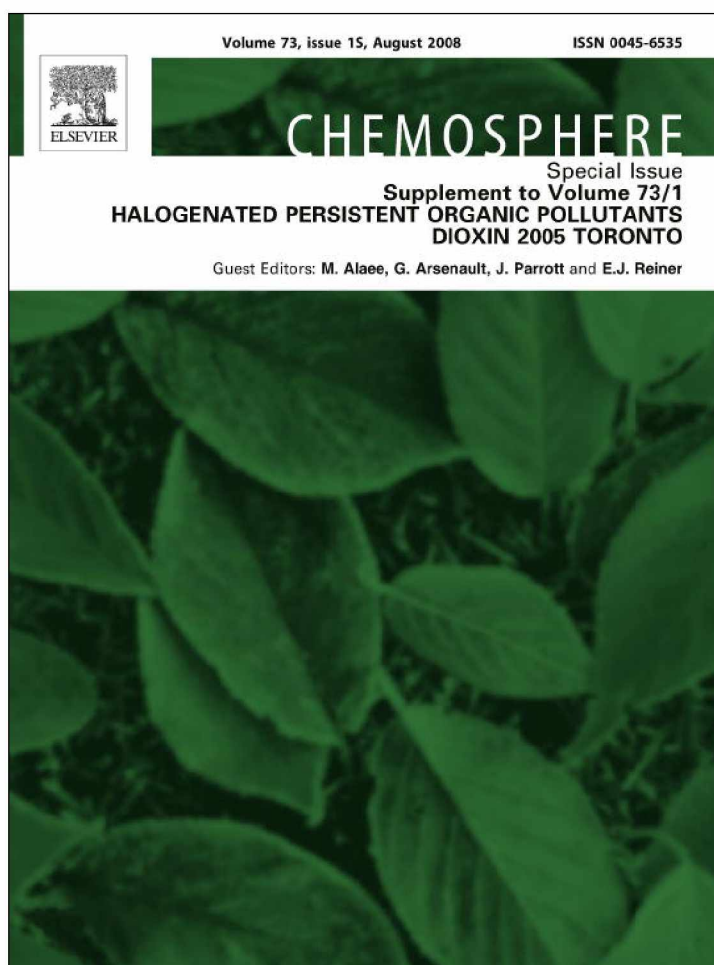
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Species-specific concentrations of perfluoroalkyl contaminants in farm and pet animals in Japan

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ARTICLE INFO

Article history:

Accepted 27 December 2006

Available online 24 April 2008

Keywords:

Perfluorinated compounds

Farm animals

Pet animals

Serum

Liver

Japan

ABSTRACT

The persistent metabolites of perfluorinated compounds (PFCs) which have been detected in the tissues of both humans and wildlife, and human contamination by PFCs suggest differences in the exposure patterns to these compounds. However, studies focused on identifying human exposure pathways to PFCs are scarce. To provide a preliminary assessment of PFCs in farm animals such as chicken, cattle, pigs, goats and horses, blood and liver samples were collected from various regions in Japan. Additionally, dog sera samples representing pet animals were also employed for analysis. Perfluorooctane sulfonate (PFOS) was the most prominent contaminant found in farm and pet animals, with mean sera PFOS concentrations (in decreasing order) of: chicken (5.8 ng/ml) > cattle (3.0 ng/ml) > goat (2.4 ng/ml) > horse (0.71 ng/ml) > pig (0.37 ng/ml). Chicken livers (67 ng/g) contained the highest mean PFOS concentration among the farm animals, followed by those of pigs (54 ng/g) and cattle (34 ng/g). In comparison to PFOS levels in farm animals, the detected levels of other PFCs were not significant. The high levels of PFOS found in cattle fetal livers suggest that PFOS crosses the placental barrier to enter fetal circulation. The consumption of chicken by humans might produce higher PFOS exposure in humans compared to that in farm animals; however, the current levels of PFOS in farm animals in Japan were lower than those reported in fish and wild animals. Elevated concentrations of both PFOS (25 ng/ml) and perfluorohexane sulfonate (PFHxS; 10 ng/ml) were found in dog sera, indicating that further studies are needed to identify PFC sources in the human environment.