Modeling the exposure of children and adults via diet to chemicals in the environment with crop-specific models

Exposure to chemicals via diet is a major uptake pathway for many compounds but is often estimated in a rather generic way. We use a new model framework (NMF) with crop-specific models to predict the dietary intake by 4–5-year-old children and 14–75-year-old women of three environmental compounds from their background concentrations in soil and air. Calculated daily intakes of benzo(a)pyrene and 2,3,7,8-TCDD are in good agreement with measured results from diet studies. The major source of both compounds in human diet is deposition from air. Inhalation of air and ingestion of soil play a minor role. Children take up more than twice the amount than adults per kg bodyweight, due to higher consumption per kg bodyweight. Contrary, the methods for indirect human exposure suggested in the Technical Guidance Document (TGD) for chemical risk assessment in the EU lead to overprediction, due to unrealistic consumption data and a false root model.

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