Defining product intake fraction to quantify and compare exposure to consumer products - DTU Orbit (07/04/2019)

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There is a growing consciousness that exposure studies need to better cover near-field exposure associated with products use. To consistently and quantitatively compare human exposure to chemicals in consumer products, we introduce the concept of product intake fraction, as the fraction of a chemical within a product that is eventually taken in by the human population. This metric enables consistent comparison of exposures during consumer product use for different product-chemical combinations, exposure duration, exposure routes and pathways and for other life cycle stages. We present example applications of the product intake fraction concept, for two chemicals in two personal care products and two chemicals encapsulated in two articles, showing how intakes of these chemicals can primarily occur during product use. We demonstrate the utility of the product intake fraction and its application modalities within life cycle assessment and risk assessment contexts. The product intake fraction helps to provide a clear interface between the life cycle inventory and impact assessment phases, to identify best suited sentinel products and to calculate overall exposure to chemicals in consumer products, or back-calculate maximum allowable concentrations of substances inside products.

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