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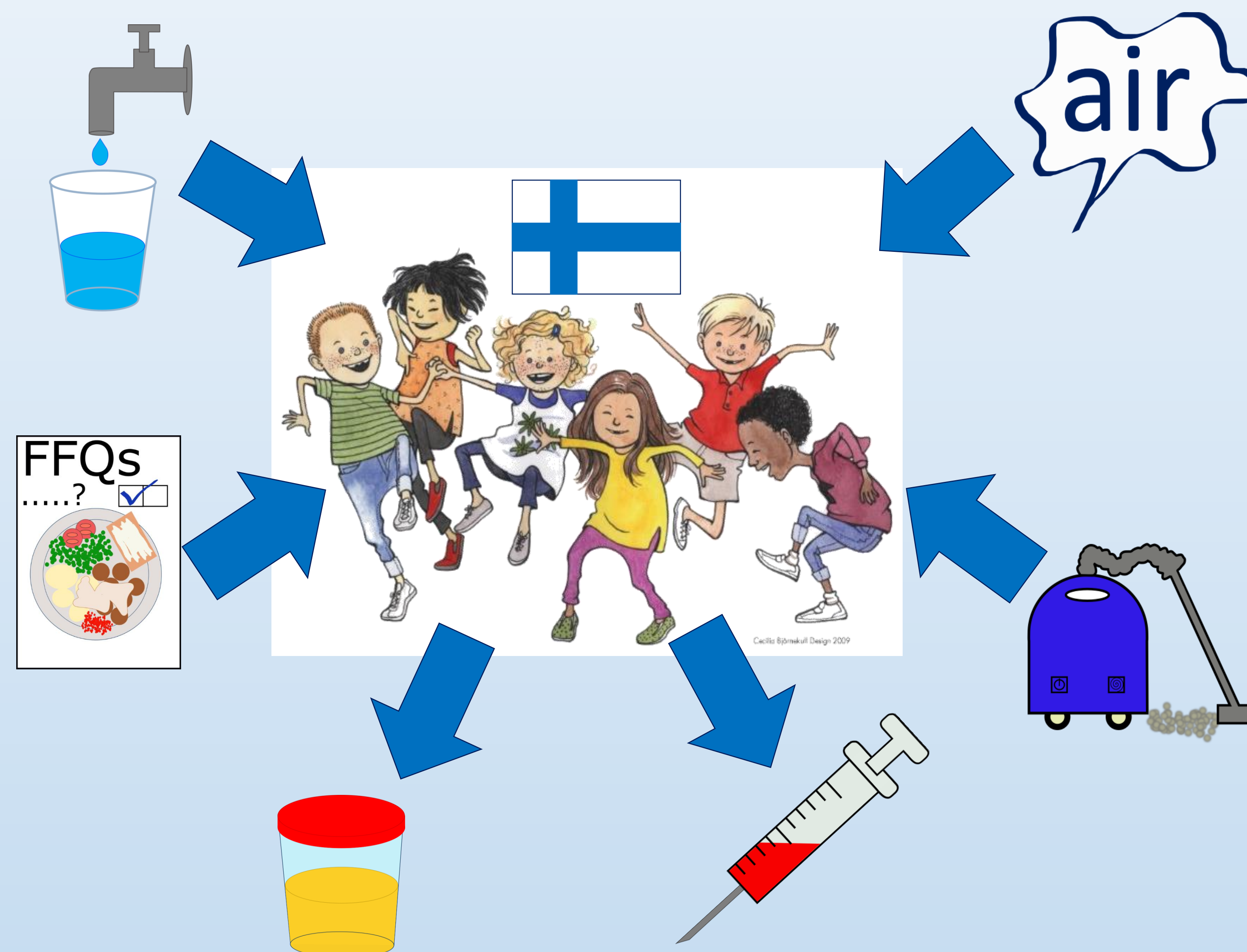
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Background

Exposure to chemicals during sensitive childhood development stages has been linked to several diseases. However, knowledge about early life exposure to many chemicals is limited. “Childhood Exposure to Environmental Pollutants (CEEP)” is a joint research project between the National Institute for Health and Welfare (THL) in Finland and the Department of Environmental Science and Analytical Chemistry (ACES, Stockholm University) with focus on childhood exposure to perfluoroalkyl acids (PFAAs) and their precursors. A quantitative understanding of multiple exposure pathways will help future decision making and highlight possible exposure reduction potential.

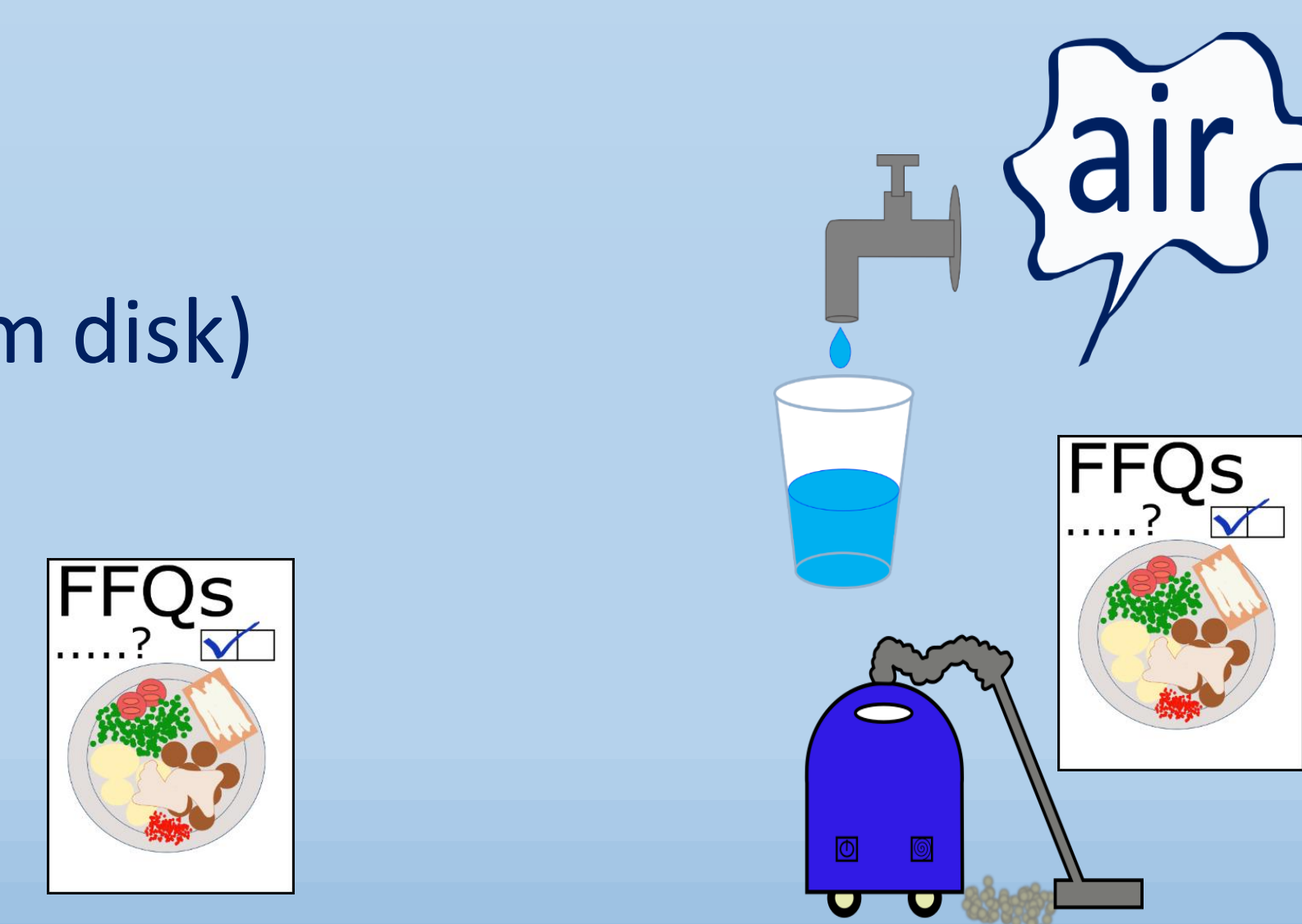


Methods

- Samples (air, drinking water, dust, urine, blood) and FFQs will be treated individual-based
→ NO pooling
- All samples will be extracted and the extracts cleaned up and analyzed: FTOHs and FOSA/Es by GC-MS, PFAAs (PFCAs and PFSAAs) by LC-MS
- FFQ data will be combined with previously measured concentrations of target compounds in food items from Sweden to quantify dietary intake (Gebbink et al. 2015, Vestergren et al. 2012)
- Exposure model will describe the relationship between external and internal exposure

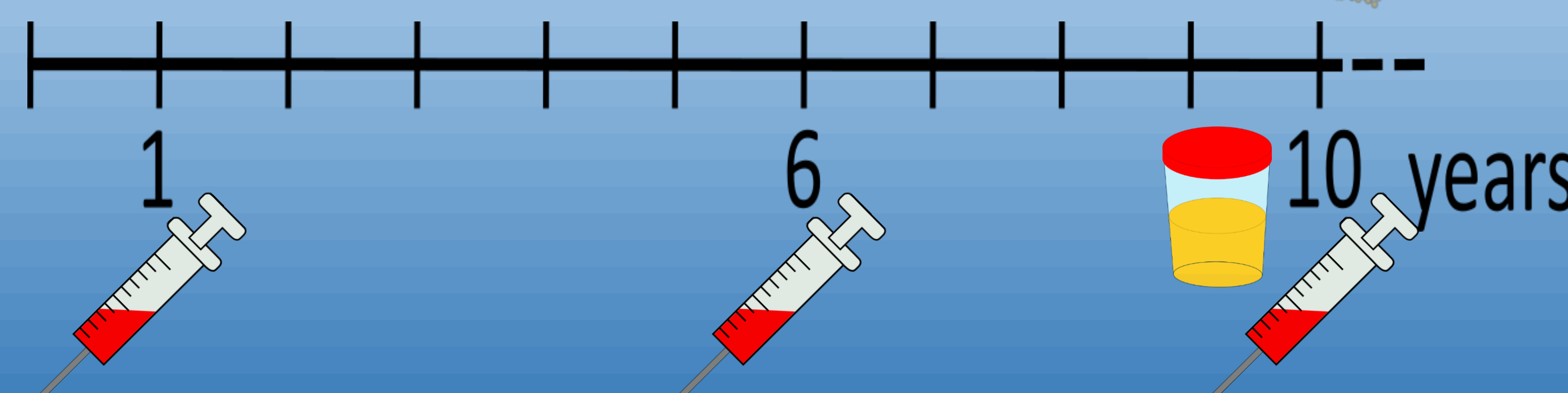
Sampling

- Study participants: 55 Finnish children from the Kuopio area followed over the course of 10 years
(subgroup of a larger study, called LUKAS2)
- Sampling years: 2005/6, 2010/11, 2014/2015
(children’s age: 1, 6, 10 years)
- Indoor sampling of each household:
 - Passive air samples over 3 weeks
(SIPs = XAD-4 sorbent impregnated polyurethane foam disk)
 - dust samples (vacuum cleaned floor)
- Drinking water samples from all water suppliers
- Individual-based food frequency questionnaires (FFQs)
- Urine and blood samples taken with hospital cooperation



Planned outcomes

- Children’s urinary clearance rates of PFAAs
 - The longitudinal PFAS trend in children’s serum will be a novel data set to understand body loads during childhood and identification of possible peak exposure
 - Multiple exposure media measurements will be valuable input data for models and allow quantification of the relative importance of the different exposure pathways of PFASs to children
 - Quantifying and understanding the exposure will support:
 - interpretation of epidemiological studies
 - risk assessment and management strategies.
- ultimately leading to reduced exposure of children to PFAAs



Acknowledgement

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Literature

- Gebbink WA, Glynn A, Darnerud PO, Berger U. 2015. Perfluoroalkyl acids and their precursors in Swedish food: The relative importance of direct and indirect dietary exposure. ENVIRON POLLUT 198(0): 108-115.
- Vestergren R, Berger U, Glynn A, Cousins IT. 2012. Dietary exposure to perfluoroalkyl acids for the Swedish population in 1999, 2005 and 2010. ENVIRON INT 49: 120-127.
- Picture happy children: http://www.majema.se/wordpress/wp-content/uploads/2010/10/glada_barn_ff_web.jpg