

Breast milk is best, but it could be better

Malgré 20 ans d'études de biosurveillance sur les substances per- et polyfluoroalkylées (PFAS) dans le sérum et l'urine, nous sommes toujours confrontés à une mauvaise compréhension des teneurs en PFAS dans le lait maternel. Cette constatation a amené un groupe de recherche du Canada et des États-Unis à évaluer et à analyser le nombre limité d'études, publiées jusqu'à maintenant sur ce sujet.

Ondanks de 20 jaar lange biomonitoring van poly- en perfluoralkylstoffen (PFAS) in serum en urine, weten we nog steeds veel te weinig over de PFAS-concentraties in moedermelk. Deze vaststelling leidde een onderzoeksgroep uit Canada en de Verenigde Staten ertoe om het beperkt aantal studies, dat tot nu toe over dit onderwerp is gepubliceerd, te evalueren en te analyseren.

Despite 20 years of biomonitoring studies on per- and polyfluoroalkyl substances (PFAS) in both serum and urine, we still face poor understanding of PFAS concentrations in breast milk. This finding led a research group from Canada and the United States to evaluate and analyse the limited number of studies that have so far been published on that subject [LaKind et al. 2022].

A large family of organic and synthetic chemicals

PFAS are widely used in everyday products such as non-stick coatings for cooking food, water-repellent or stain-resistant fabrics, and personal care products. They are a large class of more than 9000 structurally different compounds, many of which have been used since the 1950s [Glüge et al. 2020]. PFAS are often referred to as *forever chemicals*, since their chemical composition gives them excellent persistence in the environment. They do not occur naturally, are widespread and resistant to degradation, and have been detected in people and wildlife all over the world [Brase et al. 2021]. It soon became clear that some PFAS were measurable in the serum of at least 95 % of the adolescent and adult US population [Calafat et al. 2007].

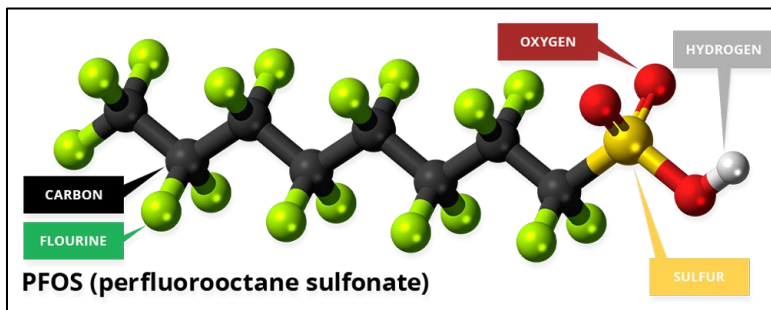
Numerous recent contamination events triggered suspicion and fear of adverse health effects. The concerns regarding the lack of robust information on PFAS concentrations in breast milk as well as the implications for both breast-fed infants and their families were recently voiced by people living in communities impacted by significant and known PFAS contaminations.

Are PFAS threatening the health of the youngest among us? Are they threatening future generations? Are they threatening our biosphere? People have far too few answers to these questions.

A Canadian-American research group analysed few available data

To overcome the scarcity of available data, the researchers developed a model using the ratios of serum to breast milk concentration published in the scientific literature to estimate the concentrations in breast milk of four PFAS. The scientists focussed on 4 fluor compounds: perfluorooctanoic acid (PFOA),

perfluorooctanesulfonic acid (PFOS), perfluorohexanesulfonic acid (PFHxS), and perfluorononanoic acid (PFNA).



The comparison of measured and estimated concentrations in breast milk with screening values for drinking water proved that the mean measured and estimated PFOA and PFOS concentrations in breast milk exceeded screening values, sometimes by more than two orders of magnitude. By contrast, for PFHxS and PFNA, most of the mean measured or estimated concentrations in breast milk were below the drinking water screening values.

Building firm conclusions on data for four out of 9000 different molecules is almost impossible. Nevertheless, these results are not meaningless. Everyone will agree that PFAS do not belong in breast milk!

Cause for concern

A brief look at the data suggests there is a huge unknown. That children's drinking water screening values are exceeded does not indicate that adverse health effects will occur. This should not be interpreted as a reason not to breastfeed. It does however indicate that the situation should be thoroughly further evaluated and investigated. It is more than time to gain a better understanding of environmental chemical transfer to an exceptionally important source of infant nutrition.

The authors caution against making recommendations, since limited data availability have so far not enabled the uncertainties and accuracies of the estimated results to be correctly evaluated. Moreover, it should not be forgotten that infant PFAS exposures originate *in utero*, and may also be due to food sources and formula feeding.

Facing data gaps can lead to erroneous conclusions

The authors of the paper strongly remind their readers that the information is designed to highlight important data gaps in their understanding of PFAS and breast milk. Nevertheless, some misuse the fact that there is too little data available. Witness the statement by the director of 3M for Europe, the Middle East and Africa, who recently claimed that "*after more than 20 years of research we can decide that there is no health impact, at the concentrations we see today and in the past*" [Vanmeldert 2021]. How does he know? Can he produce the peer review papers that confirm his statement?

Whenever public health could be at risk, extreme caution is needed. When it comes to our children and grandchildren, we cannot be careful enough. We are responsible for their future. They are still too young and too powerless to assume the responsibility. Intergenerational responsibility is what adults need to pay heed to!

References

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