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Study | 01.10.2026

PFAS levels in Europeans

An exploratory study

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This study with 110 volunteers was performed to assess the extent and potential health risk of PFAS exposure among Europeans. It included the analysis of four long-chain PFAS (PFOS, PFOA, PFHxS and PFNA, also called EFSA-4) and five ultrashort-chain PFAS (TFMS, TFA, PFEtS, PFPrA and PFPrS). Of the 110 participants, 79 filled out a questionnaire that addressed potential predictors of PFAS exposure. The main findings of this study are listed below:

Occurrence

- All participants had long-chain PFAS PFOS, PFOA, PFHxS and PFNA in their serum. The patterns were in line with what is generally observed in human biomonitoring studies among the general population.
- Of the ultrashort-chain PFAS analysed, only TFA and PFPrA were detected (in 100% and 23% of the participants, respectively). PFPrA levels were relatively low. In contrast, TFA concentrations in this study were roughly 4–5 times higher than the summed four long-chain PFAS. The median TFA serum levels in present study are the highest reported in humans thus far.

Predictors of PFAS exposure

- No clear differences in PFAS levels between participants from different European countries were observed. However, this could not be reliably tested due to the low number of participants per country and the limited contrast in PFAS levels between participants.
- Long-chain PFAS levels increased with age in men, but not in women. This is in line with what is seen in other biomonitoring studies. There were no clear differences in TFA levels between men and women.
- Self-reported dietary habits were associated with PFAS levels: as expected, long-chain PFAS levels increased with fish/seafood and meat intake. TFA levels appeared to be lower with increased meat intake (no association with fish/seafood), although limited dietary information from the

questionnaires precluded conclusions about the dietary patterns or sources underlying this association. •

- No clear patterns with PFAS levels were observed for the other predictors (BMI, statin use, blooddonation frequency, menopausal status, non-stick cookware use, take-away food frequency, water source (bottled or tap water), and self-reported residential proximity to industrial or other point sources, occupation), when analysed alone or in combination. This may be due to the study design.

Health risks

- The levels of the sum of the four long-chain PFAS (ΣEFSA-4 = PFOS + PFOA + PFHxS + PFNA) exceeded the threshold of what is considered safe by EFSA in 27 of the 110 participants (25%). While the exceedance was relatively modest, with the top 5% highest exposed participants exceeding the threshold level at least 1.7 times, it exceeds what is considered to be safe and health effects cannot be excluded. This is particularly concerning for women of reproductive age (4 of whom exceeded the threshold in this study), given the possible adverse effects on the developing immune system of their (future) children.
- For TFA, no suitable health-based guidance value is currently available to assess the health risk of TFA levels in serum. However, European Agencies have recently agreed on a classification of TFA as reproductive toxicant (“may cause harm to the unborn child” and “is suspected of damaging fertility”) and lowered the acceptable daily intake to 0.014 mg/kilogram bodyweight per day, stressing the increasing concern for human health impact by TFA.

Given the design of this study, the findings in the present report should be interpreted with caution. Nevertheless, they support the urgency to continue efforts to reduce PFAS exposure and highlight the need for inclusion of ultrashort-chain PFAS such as TFA in future human health impact and biomonitoring studies.

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