COMMUNITY WATER CENTER
EL CENTRO COMUNITARIO POR EL AGUA

PFAS

Per- and polyfluoroalkyl substances (PFAS) are a large class of thousands of man-made chemicals widely used for their oil and water repellency, temperature resistance, and friction reduction. Various industries manufacture and use PFAS in items such as cookware, food packaging, cosmetics, cleaning supplies, firefighting foam, and textiles. PFAS have grown into a global environmental and public health threat because they tend to share several problematic properties (see graphic).

COMMON PFAS PROPERTIES
Persistent: Resistant to breakdown
(Bio)accumulative: Build up in humans, animals, or the environment
Mobile: Spread easily through air, water, soil etc.
Toxic: Harmful to humans or other species

Pathways of Exposure

PFAS are found virtually everywhere: air, soil, water, food, plants, wildlife, and in the bodies of people.[1] Figure 1 displays the wide array of sources that continue to expose us to PFAS every day. Millions of people are exposed to PFAS through their drinking water. For these people, drinking water is likely the dominant source of exposure.[2] There are many sources across the nation contributing to PFAS contamination of drinking water, including industrial facilities, landfills, wastewater treatment plants, and fire training sites at airports and military bases.[3]

FIGURE 1: COMMON SOURCES OF PFAS EXPOSURE

Possible Health Impacts of Long-Term Exposure

PFAS have been linked to a variety of serious health effects including kidney cancer, decreased response to vaccines, increased total cholesterol, preeclampsia, pregnancy-related hypertension and thyroid hormone disruption.[4] PFAS are chemically similar, and it is likely that the health risks associated with one PFAS can occur for others as well.[5] Because people are often exposed to many of these chemicals at the same time, there is a concern that different PFAS will target the same biological systems and cause greater effects than any single PFAS on its own.

Sensitive Populations

Some PFAS have been shown to build up in people, even before birth.[6] These can take decades to be eliminated from the human body. Almost all babies and young children are exposed to PFAS, through fetal exposure during pregnancy and through contaminated infant formula or breast milk. Fetuses, infants, and children are particularly susceptible to the harmful effects of PFAS due to the rapid growth and complex developmental events they undergo.[7]

Tips for Reducing Exposure

- Learn more from groups involved in reducing PFAS use and exposure:
  - Community Water Center: https://www.communitywatercenter.org/PFAS
  - Natural Resources Defense Council: https://nrdc.org/PFAS
  - National PFAS Contamination Coalition: https://pfasproject.net/
- Learn more about treatment systems that have been certified by NSF International to reduce PFOS and/or PFOA in drinking water.[8]
- Avoid PFAS in products when you shop:
  - For a list of PFAS free products: https://pfascentral.org/pfas-basics/pfas-free-products/
  - Replace nonstick cookware with stainless steel, cast-iron, glass, or ceramic alternatives.
  - Avoid “PTFE”, “fluoro”, “Scotchgard”, and “GoreTex” treatments and products advertised as stain-resistant, waterproof, and water-resistant.
  - Minimize fast food when possible. Avoid heating up food that is wrapped in grease-resistant packaging.
  - Make popcorn on the stovetop instead of in PFAS-treated microwave bag

PFAS References

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2. Robin Vestergren and Ian T. Cousins, "Tracking the Pathways of Human Exposure to Perfluorocarboxylates," Environmental Science & Technology 43, no. 15 (July 2009): 5565-5575,

3. Xindi C. Hu et al., "Detection of Poly- and Perfluoroalkyl Substances (PFASs) in US Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants," Environmental Science & Technology 3, no. 10 (October 2016): 344-350, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5062567/.

4. California Office of Environmental Health Hazard Assessment, "Proposed Public Health Goals for Perfluorooctanoic Acid and Perfluorooctane Sulfonic Acid in Drinking Water" (July 2021) https://oehha.ca.gov/sites/default/files/media/downloads/crnr/pfoapfosphgdraft061021.pdf. EPA, "Human Health Toxicity Values for Perfluorobutane Sulfonic Acid (CASRN 375-73-5) and Related Compound Potassium Perfluorobutane Sulfonate (CASRN 29420-49-3)" (April 2021), https://ordspub.epa.gov/ords/eims/eimscomm.getfile?p_download_id=542393

5. Zhanyun Wang et al., "A Never-Ending Story of Per- and Polyfluoroalkyl Substances (PFASs)?" Environmental Science & Technology Letters 51, no. 5 (February 2017): 2508-2518, https://pubs.acs.org/doi/pdf/10.1021/acs.est.6b04806?rand=38bb0lry.

6. Kirsten M. Rappazzo, Evan Coffman, and Erin Hines, "Exposure to Perfluorinated Alkyl Substances and Health Outcomes in Children: A Systematic Review of the Epidemiologic Literature," International Journal of Environmental Research and Public Health 14, no. 7 (June 2017): 691, https://www.ncbi.nlm.nih.gov/pubmed/28654008.

7. Philip J. Landrigan and Lynn R. Goldman, "Children's Vulnerability to Toxic Chemicals: A Challenge and Opportunity to Strengthen Health and Environmental Policy," Health Affairs 30, no. 5 (May 2011): 842-850, https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2011.0151.

8. The State of California currently does not certify household treatment systems that can reduce the level of PFAS in drinking water. NSF International does certify treatment systems that reduce PFOS and PFOA in drinking water to the EPA health advisory level (70 ppt), which is much higher than the California Public Health Goals of (0.007 ppt and 1ppt) as well as the notification limits and MCLs set by other states. See this Environmental Working Group (2021) article for a detailed discussion of treatment options: https://www.ewg.org/news-insights/news/removing-toxic-fluorinated-chemicals-your-homes-tap-water