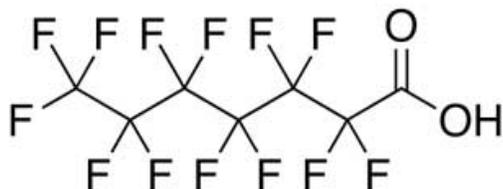


Perfluoroheptanoic acid (PFHpA)

 $C_7HF_{13}O_2$


Summary of Health Effects

PFHpA may harm development, or the liver based on animal and *in vitro* studies.

How is PFHpA used?

PFHpA belongs to a class of chemicals called perfluoroalkyls which are often applied to consumer products as a water or stain protectant or surface coating.¹ PFHpA was found in consumer products including cosmetics and children's sportswear and outdoor clothing.²

Toxicity: What are its health effects?

PFHpA is listed as a Substance of High Concern by the European Union due to reproductive toxicity and its persistent, bioaccumulative and toxic properties.³

The Agency for Toxic Substances and Disease Registry Toxicological Profile for Perfluoroalkyls concluded that animal studies have shown that the liver is a sensitive target of PFHpA.¹ PFHpA accumulated in mouse livers and induced liver enlargement after intraperitoneal (abdominal) injection.⁴

A 2021 study found several developmental changes to the reproductive systems of male rats fed PFHpA during puberty.⁵ Frog eggs treated with PFHpA developed changes to extracellular proteins

involved in cell growth and survival⁶, which is suggestive of developmental toxicity.

Rats with PFHpA applied to their skin developed severe ulcerative dermatitis, histopathologic lesions, and systemic changes in the kidney, liver, and testes.⁷

Some studies in people show that certain perfluoroalkyl chemicals may affect growth, learning and behavior of infants and older children, lower a woman's chance of getting pregnant, interfere with the body's natural hormones, increase cholesterol levels, affect the immune system, and increase the risk of cancer.⁸

Exposure: How can a person come in contact with it?

A person may come into contact with PFHpA, from skin contact with consumer products that contain PFHpA, by eating or drinking contaminated food or drinking water or by breathing in contaminated air or dust.

Biomonitoring studies have detected PFHpA in human blood, and breast milk.^{1,9,10} PFHpA has also been found in indoor and outdoor air, dust, water, soil, and food and fish and wildlife.^{1,11}

References

1. Agency for Toxic Substances & Disease Registry (2021). ATSDR Toxicological Profile for Perfluoroalkyls. www.atsdr.cdc.gov/ToxProfiles/tp200.pdf
2. Danish Ministry of the Environment, Environmental Protection Agency. *Surveys on chemicals in consumer products; Reports 136, 169*. Retrieved from eng.mst.dk/chemicals/chemicals-in-products/consumers-consumerproducts/danish-surveys-on-consumer-products
3. ECHA Candidate List of substances of very high concern for authorisation (SVHC). Retrieved from echa.europa.eu/candidate-list-table
4. Kudo, N., Suzuki-Nakajima, E., Mitsumoto, A., & Kawashima, Y. (2006). Responses of the liver to perfluorinated fatty acids with different carbon chain length in male and female mice: in relation to induction of hepatomegaly, peroxisomal beta-oxidation and microsomal 1-acylglycerophosphocholine acyltransferase. *Biological & pharmaceutical bulletin*, 29(9), 1952–1957. doi.org/10.1248/bpb.29.1952
5. Li, Z., Li, C., Wen, Z., Yan, H., Zou, C., Li, Y., Tian, L., Lei, Z., Li, H., Wang, Y., Zhong, Y., Ge, R.S.(2021) Perfluoroheptanoic acid induces Leydig cell hyperplasia but inhibits spermatogenesis in rats after pubertal exposure. *Toxicology*, 30(448), 152633. doi.org/10.1016/j.tox.2020.152633
6. Kim, M., Park, M.S., Son, J., Park, I., Lee, H., Kim, C., Min, B., Ryoo, J., Choi, K.S., Lee, D., Lee, H. (2015). Perfluoroheptanoic acid affects amphibian embryogenesis by inducing the phosphorylation of ERK and JNK. *International Journal of Molecular Medicine*, 36(6), 1693-700. doi.org/10.3892/ijmm.2015.2370
7. Han, J. S., Jang, S., Son, H. Y., Kim, Y. B., Kim, Y., Noh, J. H., Kim, M. J., & Lee, B. S. (2020). Subacute dermal toxicity of perfluoroalkyl carboxylic acids: comparison with different carbon-chain lengths in human skin equivalents and systemic effects of perfluoroheptanoic acid in Sprague Dawley rats. *Archives of toxicology*, 94(2), 523–539. doi.org/10.1007/s00204-019-02634-z
8. Perfluoroalkyl and polyfluoroalkyl substances (PFAS) Frequently Asked Questions, 8/22/17, Agency for Toxic Substances and Disease Registry, Centers for Disease Research and Prevention. www.atsdr.cdc.gov/pfas/docs/pfas_fact_sheet.pdf
9. Centers for Disease Control and Prevention (2015). Fourth national report on human exposure to environmental chemicals: Updated tables February 2015. Atlanta, GA. Retrieved from www.cdc.gov/exposurereport/
10. Biomonitoring California. California Environmental Contaminant Biomonitoring Program. USA: Biomonitoring California.
11. Hazardous Substances Databank (HSDB) (2014). Perfluoroheptanoic acid, (CASRN: 375-85-9). Bethesda, MD. Retrieved from: pubchem.ncbi.nlm.nih.gov/source/hsdb/8293