

Reducing Exposures: Perfluoroalkyl Substances

Perfluoroalkyl Substances (PFAS) are a family of manmade chemicals that have been widely used for decades. They are extremely stable and do not breakdown in the environment. Common uses of PFAS include 1) nonstick cookware, stain-resistant carpets and fabrics, 2) coatings on some food packaging (especially microwave popcorn bags and fast food wrappers), 3) components of fire-fighting foam, 4) many industrial applications, 5) consumer products – for example, products that are stain and/or water resistant, cosmetics, and some cleaning products.

People are exposed to PFAS primarily through drinking beverages or eating food made with contaminated water and exposure to PFAS in dust or consumer products. Exposures that are expected to be minor include 1) exposure through skin contact because absorption through skin is low and 2) exposure through breathing in fine water droplets is expected to be infrequent, short, and involve small amount.

Some PFAS can build up and stay in the human body for many years. They can also slowly decline if the exposure stops.

PFAS have been found in the groundwater and surface water in Minnesota. Our understanding and ability to detect PFAS in the environment has evolved since the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Health (MDH) began investigating them in 2002. Laboratories at that time only identified a few PFAS and could not detect very low concentrations. The science in the past also suggested that exposure to very small amounts of PFAS were not a health concern.

We are now able to measure extremely small amounts (parts per trillion in water) of an increasing number of PFAS and newer studies suggest long-term exposure to PFAS in this range might affect the most vulnerable members of the population. MDH continues to monitor and examine the growing body of science about PFAS and we will adjust our health advice as needed.



Health Risks

Scientists are actively studying PFAS exposures and human health impacts. Numerous studies have shown that higher levels of exposure to PFAS are associated with a wide range of human health effects. These include higher cholesterol, changes to liver function, reduced immune response, thyroid disease, and, in the case of PFOA, kidney and testicular cancer. However, more work needs to be done to determine if PFAS, or other factors, caused the effects. Research continues on PFAS to determine effects on birth outcomes, hormone balance, cholesterol levels, immune response, and cancer. There are many different PFAS and each may have varying roles for different effects.

Studies in animals show strong evidence that PFAS can harm health both early in life and as animals get older. Studies have shown some effects such as changes in development, liver and thyroid function, immune response, increased liver and kidney weight and cellular changes. Increased tumors were also observed in certain organs in animals exposed to very high doses of PFOA.

For information about MDH health-based guidance, see [Perfluoroalkyl Substances \(PFAS\) \(www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html\)](http://www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html)

While we believe the immediate health risks for people exposed to PFAS are low, the latest information indicates fetuses and infants are more vulnerable. Long term exposure to PFOA, PFOS, and PFHxS leads to a buildup of these chemicals in women of child-bearing age that increases exposure to the fetus and breastfed babies. Breastfeeding provides many health benefits for mothers and babies. MDH recommends that women currently breastfeeding, and pregnant women who plan to breastfeed, continue to do so. MDH recommends that women who plan to become pregnant follow the recommendations for reducing exposure provided below.

How to reduce your exposure to PFAS

PFAS are present in people and animals all over the world. They are found in some food products and the environment (air, water, soil, etc.). Eliminating all exposure to PFAS is unlikely; however, you can take the following steps to reduce your exposure to PFAS.

- Reverse osmosis and activated carbon treatment systems can reduce the levels of PFAS in water. MDH provides information about inexpensive and easy to use systems that people can install in their home to reduce exposure to PFAS through drinking water on the following webpages:
 - [Water Treatment Using Carbon Filters: GAC Filter Information \(www.health.state.mn.us/communities/environment/hazardous/topics/gac.html\)](http://www.health.state.mn.us/communities/environment/hazardous/topics/gac.html)
 - [Home Water Treatment Units: Point-of-Use Devices \(www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html#point\)](http://www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html#point)
 - [Evaluation of Perfluorochemical Removal by a Small, Point-of-Use Filter \(PDF\) \(www.health.state.mn.us/communities/environment/hazardous/docs/pfas/poueval.pdf\)](http://www.health.state.mn.us/communities/environment/hazardous/docs/pfas/poueval.pdf)
- NSF International (NSF) provides independent testing and certification of treatment systems, recognized by the American National Standards Institute (ANSI). When purchasing any treatment system for PFAS, look for products that are certified to NSF/ANSI 53 (filters) or NSF/ANSI 58 (RO systems) for PFOA and PFOS removal. These products have been tested to industry standards to verify they remove PFOA and PFOS down to the EPA Lifetime Health Advisory level of 70 parts per trillion (ppt).
- If your drinking water is or may be contaminated with PFAS: If your drinking water comes from a private well that has not been tested, and you are using it to prepare infant formula, you may want to prepare it with filtered tap water or bottled water until you can have the water tested to see if PFAS is present. Another option is to install a faucet filter. Information about faucet filters and treatment systems can be found on [PFAS and Home Treatment of Water \(www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html#protect\)](http://www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html#protect)

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- If your drinking water comes from a public water system, tap water can be used to prepare infant formula. All affected community public drinking water systems have put in place measures that will provide drinking water at or below MDH health-based guidance.
- You can be exposed to PFAS through food. For example, PFOS and PFOA can be present on crops due to environmental contamination. Some packaging may also transfer PFOS to food items.
 - PFOS may also be present in fish people catch and eat. Fish Consumption Guidance for fish caught in areas affected by PFOS is available on the MDH webpage: [Waterbody Specific Safe-Eating Guidelines](http://www.health.state.mn.us/communities/environment/fish/index.html#waterbody) (www.health.state.mn.us/communities/environment/fish/index.html#waterbody)
 - Watering home gardens with PFAS-contaminated water can increase the levels of PFAS in the soil and edible plants. While there is still not enough information to know what levels of PFAS in produce are “safe,” eating homegrown produce is expected to be a minor source of exposure compared to drinking PFAS-contaminated water. For more information: [PFAS and Homegrown Garden Produce \(PDF\)](http://www.health.state.mn.us/communities/environment/hazardous/docs/pfas/pfasgardproduce.pdf) (www.health.state.mn.us/communities/environment/hazardous/docs/pfas/pfasgardproduce.pdf)
- Certain consumer products contain PFAS. If you are concerned about exposure to PFAS, consider limiting use of items that contain PFAS. Here is a sampling of items that contain PFAS:
 - Some grease-resistant paper, fast food containers/wrappers, microwave popcorn bags, pizza boxes, and candy wrappers.
 - Nonstick cookware.
 - Stain resistant coatings used on carpets, upholstery, and other fabrics.
 - Water resistant clothing.
 - Some cleaning products.
 - Personal care products (shampoo, dental floss) and cosmetics (nail polish, eye makeup)
 - Paints, varnishes, and sealants
- Household dust can be a significant source of PFAS exposure, especially for infants and young children. Indoor sources (e.g., consumer products, floor waxes, stain resistant treated upholstery and carpets) contribute most to PFAS in house dust. Keeping floors and other surfaces free of dust can limit this exposure.
- PFAS may be present in lakes and rivers at very low levels. MDH has determined that exposure to PFAS through swimming is not a health concern. PFAS are poorly absorbed through skin and swallowing small amounts of water while swimming will not result in significant exposure. Also, because there is little evaporation of PFAS from water into the air, breathing them in while swimming or bathing is not a health concern.
 - PFAS-containing foam on surface water does not pose a risk to human health if skin contact with foam is minor and infrequent. The Minnesota Department of Health (MDH) recommends:
 - People and pets should avoid contact with foam on surface waters in this area.

- Wash skin that has come into contact with PFAS-containing foam with soap and water.

For more information

MDH: [Perfluoroalkyl Substances \(PFAS\)](#)

www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html

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To obtain this information in a different format, call: 651-201-4897

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