

PFHxS and Drinking Water

PFHxS

Perfluorohexane sulfonate (PFHxS) is one of a group of related chemicals known as perfluorochemicals (PFCs). These are also called perfluorinated alkylated substances (PFAS). This group of chemicals is commonly used in non-stick and stain-resistant consumer products, food packaging, fire-fighting foam, and industrial processes.

PFHxS has been used in stain-resistant fabrics and carpets, fire-fighting foams, paper coatings, and as a surfactant in industrial processes. The 3M Company was once a major manufacturer of PFHxS and products containing PFHxS, but production was phased out in 2002.¹

PFHxS in Minnesota Waters

The Minnesota Pollution Control Agency (MPCA) detected PFHxS in the Mississippi River in the Twin Cities metro area at levels up to 0.027 parts per billion (ppb). PFHxS was also detected in other urban rivers and lakes.^{2,3,4} The 3M Company detected PFHxS in the Mississippi River downstream from a manufacturing plant at levels up to 0.077 ppb.⁵

PFHxS has been detected in private drinking water wells and public drinking water systems in several parts of Minnesota where known industrial use or disposal of PFHxS occurred in the past. PFHxS has been detected in sources of public drinking water at levels up to 0.22 ppb.⁶ MDH and MPCA routinely sample affected areas for PFHxS and related chemicals.

MDH Guidance Value

As a result of limited information, MDH is not able to derive a health-based guidance value for PFHxS. A review of PFHxS is on hold until enough information is available to conduct a review. In the interim, MDH recommends using the health based value for PFOS (X.XX ppb) as a surrogate for PFHxS. PFHxS remains in the body longer than PFOS and appears to be similar in toxicity.

Potential Health Effects

The available data for PFHxS is very limited. From the one animal study available, PFHxS exposure resulted in decreases in body weight and cholesterol levels, as well as an increase in blood clotting time. Studies of PFHxS in people are lacking.

Potential Exposure to PFHxS

Routine monitoring of PFHxS in blood shows that exposure to PFHxS is very common, even among people who do not live in areas with PFCs in drinking water. Large-scale biomonitoring programs show that PFHxS levels in people's blood are slowly declining.⁷ However, PFHxS can also form as a breakdown product of related PFCs, so exposure may continue even though the manufacture of PFHxS has been reduced.

For people living in areas affected by PFC releases or disposal, drinking water may be a major source of exposure to PFHxS. MDH and MPCA have studied a number of sites in Minnesota with known PFC

releases. For more information on those locations, please visit Perfluorochemicals (PFCs) in Minnesota (<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/sites.html>). Reverse osmosis and activated carbon filter treatment systems can reduce the levels of PFOS in drinking water in your home. You may choose to use bottled water for drinking and cooking for a short time, but long-term bottled water use will be more expensive than installing a treatment system.

Some PFCs transfer from a mother to infant during pregnancy and to an infant through breastmilk. Breastfeeding is important for the short and long term health of both a mother and infant. MDH recommends that women currently breastfeeding, and pregnant women who plan to breastfeed, continue to do so. Exclusive breastfeeding is recommended by doctors and other health professionals. If formula is used by those living in affected areas, it should be prepared only with treated or bottled water.

Because PFHxS stays in the environment for a long time, people can also be exposed through food and house dust.

PFHxS in the Environment

PFHxS is persistent in the environment, meaning it does not break down easily in soil or water. How PFHxS moves through soil is dependent on the makeup of the soil and its chemistry. In several areas of Minnesota, PFHxS has moved into groundwater over the course of many years.

Health Risk Assessment Unit

The MDH Health Risk Assessment Unit evaluates the health risks from contaminants in drinking water sources and develops health-based guidance values for drinking water. MDH works in collaboration with the Minnesota Pollution Control Agency and the Minnesota Department of Agriculture to understand the occurrence and environmental effects of contaminants in water.

References

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Minnesota Department of Health
Health Risk Assessment Unit
health.risk@state.mn.us
www.health.state.mn.us



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