Per- and Polyfluoroalkyl substances (PFAS) Summary

About PFAS

PFAS are a family of human-made chemicals that have been widely used for decades. PFAS are extremely stable and do not breakdown in the environmentThey have been found in the groundwater and surface water in Minnesota.

PFAS are commonly used for their water- and grease-resistant properties. People can be exposed to PFAS through the following 1) drinking contaminated municipal water or private well water, 2) eating fish caught from water contaminated by PFAS (PFOS, in particular), 3) accidentally swallowing contaminated soil or dust, 4) eating food grown or raised near places that used or made PFAS, 5) eating food packaged in material that contains PFAS, and 6) using some consumer products treated with PFAS such as stain resistant carpeting and water repellent clothing.

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.

Health Effects

There are many different PFAS, and each may impact health differently. Most studies about their effects on human and animal health have been done on two PFAS chemicals, PFOA and PFOS.

The most consistently observed and strongest evidence for harmful impacts on human health is for immune suppression (such as decreased vaccination response), changes in liver function (such as higher cholesterol, elevated liver enzymes), and lower birth weight. In addition, PFOA has also been associated with kidney cancer. There is limited evidence for additional health effects from different PFAS, including: nonalcoholic liver disease and dyslipidemia, preeclampsia and pregnancy-related hypertension, and hypothyroidism and increased thyroid disease. Other factors such as diet and genetics can also cause some of these health outcomes. Determining whether PFAS chemicals cause health effects in humans and at what levels is an active area of research and we hope to know more in the future.

A limited number of PFAS chemicals have been studied in laboratory animals. These studies show strong evidence that high exposures to PFAS can cause harmful health effects in animals 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, and increased liver and kidney weight as well as cellular changes. Increased tumors were also observed in certain organs in animals exposed to very high doses of PFOA.

While we believe the immediate health risks for most people exposed to PFAS are low, the latest information indicates that 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 get pregnant follow the

recommendations in
Reducing Exposures: Per- and Polyfluoroalkyl substances (PFAS) (PDF)
(https://www.health.state.mn.us/communities/environment/hazardous/docs/pfas/pfasreducingexp.pdf).

Consumption of infant formula mixed with water containing PFAS can result in higher exposure to PFAS because babies drink more water per body weight than adults. If you are concerned about exposure to PFAS by consumption of infant formula and would like to lower your baby's exposure to PFAS, consider using bottled water or water that has been filtered to remove PFAS as your water source.

MDH Health-based Guidance

MDH develops health-based guidance values to represent levels for several PFAS in drinking water. The guidance values are levels that MDH considers safe for all people to consume, including sensitive populations. The guidance values apply to short time periods and to a lifetime of exposure. For more information: Guidance Values and Standards for Contaminants in Drinking Water
(www.health.state.mn.us/communities/environment/risk/guidance/gw/index.html)

MDH develops health-based air guidance values to evaluate potential human health risks from exposures to chemicals in ambient air. An air guidance value is a concentration of a chemical that is likely to pose little or no risk to human health. Air guidance values are developed using public health protective practices that protect susceptible portions of the population (including but not limited to children, pregnant women and their fetuses, individuals compromised by pre-existing diseases, and elderly persons). Air guidance values apply to short time periods as well as a lifetime of exposure. More information can be found on the MDH website at MDH Air Guidance Values
(https://www.health.state.mn.us/communities/environment/risk/guidance/air/table.html).

For more information

On the web:

MDH Per- and Polyfluoroalkyl Substances (PFAS) webpage (https://www.health.state.mn.us/pfas)

For questions about health-based guidance and risk:

Contact the MDH Health Risk Assessment Unit at health.risk@state.mn.us or call 651-201-4899.

For questions about health and contaminated sites:

Contact MDH Site Assessment and Consultation Unit at health.hazard@state.mn.us or call 651-201-4897.

Minnesota Department of Health | Site Assessment and Consultation Unit | 651-201-4897 | | hazard.health@state.mn.us
www.health.state.mn.us | To obtain this information in a different format, call: 651-201-4897

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