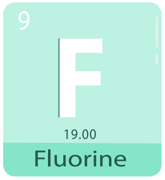

FLUORIDE VS. PFAS EXPLAINER

FLUORIDE

What is fluoride?

Fluoride is the negatively charged ion of Fluorine, which is the 13th most abundant element in the Earth's crust.

Fluoride is part of the geological composition of soils and bedrock and is naturally present in groundwater, surface water, and rainwater. Fluoride levels in water vary based on location due to differences in regional geology.

All plants also contain small amounts of fluoride that they absorb from soil and water.

Where is fluoride found in your daily life?

Fluoride-containing compounds are used to prevent tooth decay and protect oral hygiene. By combining with outer layers of tooth enamel, fluoride reduces the rate of the enamel's breakdown and helps strengthen the remaining enamel[1]. Sources of fluoride for oral health include over-the-counter fluoridated toothpastes, treatments applied or prescribed by health care professionals, and most public drinking water in the United States.

Public drinking water suppliers carefully add optimized amounts of fluoride and are required by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act to monitor and manage the concentration of fluoride in their treated drinking water[2]. Community water fluoridation first became officially recommended U.S. public health policy in 1951, and by 2022, over 72% of the U.S. population served by public water supplies had access to fluoridated water[3,4].

PFAS

What are PFAS?

PFAS, or per- and polyfluoroalkyl substances, are a class of over 14,000 man-made chemicals that do not occur naturally. A chemical is classified as PFAS if it contains at least one carbon atom that is fully saturated with chemical bonds to fluorine atoms.

These carbon-fluorine bonds are among the strongest known in chemistry, making PFAS extremely resistant to degradation and earning them the nickname "forever chemicals."

Where are PFAS found in your daily life?

PFAS are used in a wide variety of consumer products such as foodware and food packaging, Teflon cookware, cosmetics and personal care products, and water- or stain-resistant clothing, fabrics, and carpets. PFAS are also used in some firefighting foams. Because PFAS are so resistant to degradation, they persist for a long time and can leak into air, indoor dust, soil, and water. As a result, PFAS have contaminated the blood of both humans and other animals and can now be detected in soil, water, and air in every environment on Earth.

People are most likely exposed to these chemicals by using products made with PFAS, consuming PFAS-contaminated water or food, breathing PFAS-contaminated air, or accidentally ingesting dust containing PFAS[13]. Because PFAS break down slowly, if at all, people who are repeatedly exposed to PFAS may take in more of these chemicals than they excrete. As a result, blood levels of some PFAS can build up over time.

FLUORIDE

Fluoride and health

Scientific studies have found for decades that widespread water fluoridation is an effective method of preventing tooth decay. Drinking fluoridated water reduces cavities by about 25% in both children and adults[5,6]. Fluoridation is also one of the most cost-effective public health interventions, and its benefits are experienced by all members of a community, regardless of socioeconomic status[7]. On average, communities save $32 per person annually by preventing cavities through fluoridation and avoiding costly dental treatments[8].

The only clear risk of higher fluoride exposure is a condition called dental fluorosis, which entails visibly detectable changes in tooth enamel in children from birth to 8 years of age[9]. A recent systematic review of published studies by the U.S. Department of Health and Human Service's National Toxicology Program did not find a causal relationship between fluoride at typical drinking water concentrations and lower IQ[10].

Policy and health recommendations

Community water fluoridation at optimized levels is recommended by state and federal public health agencies as well as the American Dental Association and the American Academy of Pediatrics[11].

In September of 2024, federal judge ordered the U.S. EPA to review regulations for fluoride in drinking water to better characterize and lower any potential risks associated with fluoride exposure[12].

Currently, public water systems are required by the U.S. EPA to notify customers when water fluoride levels exceed 2.0 mg/L. Fewer than 1% of people in the U.S. use private wells or public drinking water with fluoride above this threshold[9].

PFAS

What are the health impacts of PFAS?

PFAS have been detected in the blood of almost all people in the United States, and can cross the placenta during pregnancy and enter the fetus, as well as entering breast milk[13].

Young children may have higher exposure to PFAS due to hand-to-mouth behaviors or consuming breast milk or formula containing PFAS. Even at low concentrations, exposure to certain PFAS has been linked to a variety of serious health concerns, including increased risk of kidney, testicular, and prostate cancers[14].

Additionally, PFAS exposure has been linked to reproductive issues, such as decreased fertility and high blood pressure in pregnant women, as well as developmental effects or delays in children, including low birth weight, accelerated puberty, bone variations, and behavioral changes[14].

PFAS can disrupt the body's hormone levels and regulation, increase cholesterol levels and/or risk of obesity, alter liver and kidney function, and reduce the immune system's vaccine response and ability to fight infections[14,15].

FLUORIDE

What can you do?

If you have questions about the fluoride content of your tap water, contact your local drinking water provider.

For private well users, your local public health department can provide guidance for well water testing. If you have a child, you can discuss your water fluoride levels with their dentist or pediatrician for additional guidance on dental health.

If your water has a fluoride content of 4.0 mg/L or higher, speak with your local public health department about next steps, which may include additional water filtration before use.

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PFAS

Existing policies

PFAS have rapidly become a point of interest and public health concern because of studies that showed their prevalence in human bodies and their effects on human health.

In recent years, the U.S. EPA began to establish several policies and actions in response to this growing body of evidence, including setting legally enforceable Maximum Contaminant Levels for six PFAS in drinking water in April of 2024, although as of May 2025, the EPA announced that it would roll back four of those six restrictions[16], and many thousands of PFAS remain unregulated.

At the state level, California recently introduced proposed legislation that would set PFAS drinking water standards at least as strict as the original federal policy from 2024[17]. The state of California has also banned or restricted the use of PFAS a range of applications, including food packaging, products intended for infants and children, and menstrual products[18-20].

What can you do?

To limit personal PFAS exposure from drinking water, check with your local water provider and ask about PFAS testing, or look for your community in public databases[21]. For private well users, your local public health department can provide guidance for well water testing.

You can also make sure products you buy don't contain PFAS, which also reduces demand for products with these additives. Look for cookware, clothing, and other consumer products that are labeled PFAS-free[22-24], and avoid products that are labeled as being stain-, water-, or grease-resistant or repellent.