

What are PFAS?

PFAS, or per- and polyfluoroalkyl substances, are a group of human-made chemicals that have been used in industry and consumer products worldwide since the 1950s. PFAS chemicals are used to make household and commercial products that resist heat and chemical reactions and repel oil, stains, grease, and water. They include PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonic acid).

Where are PFAS found?

PFAS chemicals from household and commercial products may find their way into water, soil, and biosolids. As a result, PFAS have been found in people, fish, and wildlife all over the world. Some PFAS do not break down easily and stay in the environment, especially in water, and in people's bodies for a long time.

How are people exposed to PFAS?

People may be exposed to PFAS in drinking water, food, indoor dust, some consumer products, and workplaces. Drinking contaminated water or eating food that contains PFAS are the most common ways to be exposed to PFAS. PFAS are not easily absorbed through skin.

Are PFAS harmful to my health?

Exposure to PFAS may result in health problems, including developmental effects (decreased birth weight, accelerated puberty, skeletal variations, development of the immune system), cancer (testicular, kidney), liver effects, immune effects (decreased antibody response to vaccination, decreased immune response), thyroid effects, and other effects (cholesterol changes). Babies, children who are developing, and people who are pregnant or might become pregnant are especially sensitive to PFOA and PFOS. The Vermont Department of Health advises that the lower your exposure to PFAS, the lower your risk of having negative health effects. If you have health concerns about PFAS exposure, contact VDH: [Perfluoroalkyl and Polyfluoroalkyl Substances \(PFAS\) in Drinking Water | Vermont Department of Health \(healthvermont.gov\)](#). If you have been exposed to PFAS and are concerned about your health, talk to your health care provider.

Should I test my maple syrup for PFAS?

You have the option to test your maple syrup privately, however, the State of Vermont does not require that you test your maple syrup for PFAS. Vermont does not have a regulatory standard for PFAS in maple syrup. This means that if you test your maple syrup and find it contains PFAS, the Vermont Agency of Agriculture, Food and Markets (VAAFAM) is not able to tell you if it is above or below an acceptable level.

PFAS are used in many consumer products and processing equipment so it would not be surprising to find a low-level PFAS detection in a maple syrup. For example, Teflon gaskets and Teflon tape, used in many food production systems, have the potential to add a detectable amount of PFAS to any matter they touch.

Can maple trees take up PFAS from the environment?

Maple trees can take up PFAS from the environment. Scientists have learned that different plants take up PFAS in different concentrations and have only recently started to investigate PFAS uptake by maple trees. Currently, there is no way to predict the PFAS concentration in a maple tree or in the maple syrup created from its sap. Following the discovery of PFOA (one of the many different PFAS chemicals) contamination in Bennington, researchers at Bennington College found 3 and 8.8 parts per trillion (ppt) of PFOA from sap in two different maple trees¹. Around the same time, a different laboratory analyzed three samples of syrup collected by the Vermont Department of Environmental Conservation that was produced from trees near

the source of this contamination. The results showed that the syrup contained non-detectable levels of PFOA (the laboratory's lowest level of measuring PFOA was 200 ppt)².

What are possible sources of PFAS contamination in the environment that impact maple syrups?

Water and soil may be sources of PFAS contamination. Maple tree roots are shallow, typically growing no deeper than 24 inches, except for a single tap root, growing no deeper than 4 feet. Drinking water wells typically draw water from deep in the ground beyond the depth of a maple tree's tap root.

The Vermont Department of Environmental Conservation (DEC) has found PFAS in wells across Vermont. Wells can be influenced by underground plumes of PFAS centered around contamination sources. The Vermont Agency of Natural Resources (ANR) [ATLAS](#) shows where DEC has found PFAS. The U.S. Environmental Protection Agency (EPA) has set an enforceable drinking water standard for several individual PFAS chemicals that range from 4 to 10 ppt. The amount of PFAS allowed in drinking water is very low because people ingest lots of water when drinking it or cooking or brushing their teeth with it.

In maple trees, elevated soil concentrations may be a more significant source of PFAS than the PFAS present in drinking water wells on the same land. If the contamination comes in the form of deposition from nearby smokestack emissions, a sugarbush's root system, which covers a large area, could be involved in PFAS uptake. DEC sampled soil across Vermont and detected PFAS in every sample collected. In that study, DEC found the average "background" concentration of soils in Vermont is 1 to 3 parts per billion (ppb) for different PFAS³. However, PFAS distribution in maple sap from trees growing in contaminated soil is not currently understood.

How do I test my maple syrup for PFAS?

If you decide to test your maple syrup, VAAFM recommends testing syrup instead of your sap. Turning sap into syrup may concentrate any PFAS that could be in the sap. DEC maintains [a list of laboratories](#) certified by the Vermont Department of Health (VDH) for PFAS analysis. The laboratory will provide instructions on how you should collect the sample(s). It is easy to accidentally contaminate samples because PFAS is present in many everyday items. The State of Maine has produced [a pair of guides that explain the soil sampling process](#) and [water sampling process](#) for homeowners ([PFAS-homeowner-soil-sampling 092723.pdf \(maine.gov\)](#) and [PFAS-homeowner-water sampling.pdf \(maine.gov\)](#)).

Who should I contact if I have concerns about PFAS in my maple syrup?

You should contact VAAFM at (802) 828-2433 and ask to speak to the Maple Program contact. If you have concerns about PFAS test results from your maple syrup, VDH and VAAFM will work together to understand the risk to the public from your maple syrup. If it is determined by the two agencies that the maple syrup contains enough PFAS to present a hazard to the public, VAAFM has the authority to prohibit the sale of maple syrup deemed unsafe for human consumption.

Maple Products Resource page on the VAAFM website:

<https://agriculture.vermont.gov/food-safety/maple-products>

Unit conversions: 4 ppt = 0.004 ppb and 3 ppb = 3,000 ppt

¹ ITRC [14 Risk Communication – PFAS – Per- and Polyfluoroalkyl Substances \(itrweb.org\)](#)

² [Maple.syrup_results.N.Benn_.pdf \(vermont.gov\)](#)

³ DEC Background Soils Study <https://anrweb.vt.gov/PubDocs/DEC/PFOA/Soil-Background/PFAS-Background-Vermont-Shallow-Soils-03-24-19.pdf> and available at: <https://dec.vermont.gov/pfas/faq>