

PFAS, PFOS, PFOA, What Does it all Mean?

Recently, the chemical group referred to as PFAS has been making headlines as scientists have detected more and more concentrations in everyday objects, food, animals, and water sources. Research has shown PFAS, including PFOS and PFOA, have been linked to negative health effects in humans and animals, however, there is still much to learn about PFAS and how they behave in the environment.

What are PFAS?

PFAS stands for per- and polyfluoroalkyl substances. PFAS are man-made compounds with a chain of 6 or more carbon atoms that are bonded with fluorine atoms. These compounds often consist of a very soluble section which makes them difficult to extract from water sources. They also do not easily vaporize and have the capacity to bioaccumulate in the food chain.

Where are they found?

PFAS can be found in the lining of takeout containers, popcorn bags, water-resistant rain gear, nonstick pans, even some drinking water (including bottled water, groundwater, and public water supplies).

PFAS also bioaccumulate, so they can also be found within the food web. When food containing PFAS is consumed by humans or pets it can become a pathway for PFAS to enter the body.

Where do they come from?

PFAS are released into the environment primarily by manufacturing and industrial plants where PFAS are used in packaging or are created onsite. Firefighting foam contains PFAS and therefore airports, oil refineries and other places where fires may be common are also common sources of PFAS.

Why should we be concerned?

PFAS compounds are persistent because they are highly soluble and mobile in water, do not tend to break down naturally, and are difficult to remove from water and the environment by technologies readily available.

According to the EPA, PFAS have been linked to thyroid disease, kidney and testicular cancer, low birth weights, obesity, among others. More studies are currently being conducted to determine just how many health effects can be linked to PFAS.

What don't we know, and what kind of research do we need?

Since technology has only recently advanced enough to detect PFAS to low concentrations, little research has been finished or conducted. Additionally, most remediation techniques result in a hyper concentrated waste product with no proper way of disposal. Thorough understanding of

health effects, how the compounds behave and travel, and how long they persist also require further research. The EPA has started to develop substitutes for PFAS, but the consequences of those new compounds have yet to be tested as well.

What are the regulations concerning PFAS?

The EPA currently has a health advisory of 70 parts per trillion for drinking water, however, because this is just an advisory and not a limit, public water supplies are not necessarily required to report the concentrations of PFAS in their water. Regulations also vary by state, but Massachusetts has proposed a more stringent level of 20 parts per trillion instead, which is awaiting approval.

Just this year, in 2019, Massachusetts started developing techniques to certify labs in testing for PFAS using EPA standards. Until labs are certified, few towns will report on PFAS in public drinking supplies. Hyannis and Mashpee have reported detectable levels of PFAS in public drinking supplies, but other communities on Cape Cod have not reported any testing.

Where can I find more information?

More information on PFAS can be found on the [Massachusetts DEP](#) and [EPA](#) websites. Other states also have information on how they are dealing with PFAS and what regulations have been put into place.

References

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