

Toxic and Tenacious – How ‘Forever Chemicals’ Are Damaging Your Health

Analysis by [Dr. Joseph Mercola](#)

December 07, 2024

STORY AT-A-GLANCE

- › PFAS are synthetic "forever chemicals" present in thousands of everyday products from food packaging to cookware, persisting indefinitely in the environment and accumulating in living organisms, raising serious health concerns
- › Scientific research links PFAS exposure to reduced fertility, impaired fetal development, inflammation, oxidative stress and increased cancer risk, with 97% of Americans having PFAS in their blood
- › Agricultural contamination through toxic sewage sludge fertilizer affects an estimated 20 million acres of U.S. farmland, devastating crops and threatening both farmer livelihoods and food safety
- › The EU is considering comprehensive PFAS restrictions despite industry resistance, while some sectors are developing alternatives like PFAS-free firefighting foam and sportswear to reduce chemical dependency

In our modern world, certain chemicals have become so ingrained in everyday products that we hardly notice their presence – until their detrimental effects come to light. As noted in the documentary "Toxic and Tenacious – How ‘Forever Chemicals’ Are Damaging Our Health," per- and polyfluoroalkyl substances, commonly known as PFAS, epitomize this hidden threat.¹

From fast-food packaging to artificial heart valves, PFAS are omnipresent. These synthetic chemicals, often referred to as "forever chemicals" due to their persistence in

the environment, are now under intense scrutiny for their alarming impact on human health and ecosystems.

PFAS Health Implications – A Silent Epidemic

PFAS were invented over 80 years ago, celebrated for their non-flammable, water-repellent and grease-resistant properties. These characteristics made them invaluable for industrial applications, including lubricants and firefighting foams. Their stability and durability ensured their widespread adoption across various sectors, leading to their integration into an ever-increasing number of products.

However, this same robustness renders PFAS virtually indestructible, allowing them to accumulate in the environment and within living organisms. The pervasive nature of PFAS poses severe health risks. Scientific studies have linked PFAS exposure to reduced fertility, impaired sperm quality and adverse fetal development, along with inflammation and oxidative stress.²

Some PFAS variants are also classified as carcinogenic,³ further heightening concerns. The European Union (EU) has recognized the gravity of the situation, aiming to significantly restrict PFAS usage.⁴ Yet, industry leaders argue that PFAS are indispensable for technologies like e-mobility, chip production and **5G technology**, presenting a threat to public health.

PFAS' Environmental Persistence Leads to Significant Contamination

PFAS are characterized by their strong carbon-fluorine bonds, which make them exceptionally resistant to degradation. This persistence means that once PFAS are released into the environment, they remain indefinitely, accumulating in soil, water and even air.

In Rastatt, southwest Germany, the film notes, local soil contamination has reached particularly high levels, prompting extensive testing of agricultural products.

Agroecologist Melanie Zoska emphasizes that while oats absorb PFAS less than wheat or soybeans, the ongoing contamination poses a constant threat to farming and food safety.⁵

Erik Reiss, a farmer in Rastatt, illustrates the devastating impact of PFAS on agriculture. With over half of his 140 hectares (about 346 acres) of farmland contaminated, Reiss faces the heartbreaking reality of destroying entire crops like strawberries.

The economic strain is immense, with losses reaching tens of thousands of euros. Reiss's story is a stark reminder of how PFAS contamination jeopardizes not only public health but also livelihoods and threatens the very foundation of farming communities. Still, the chemicals continue to be in-demand among industry, and industrial ubiquity of PFAS is a major contributor to their environmental persistence.

Industry Resistance Keeps Toxic PFAS in Consumer Products

There are more than 14,000 PFAS,⁶ used in everything from firefighting foam to household items like furniture, clothes and plastics. Even dental floss and tampons contain them.⁷ [Fluoropolymers coat frying pans](#), fluorosurfactants render materials oil- and water-repellent and fluorinated gases serve as coolants in refrigeration systems.

This widespread use ensures that PFAS are continuously released into the environment, making contamination issues worse. In response to growing evidence of PFAS hazards, the EU has implemented a series of bans and restrictions on specific PFAS compounds. Despite these efforts, the documentary explains, the chemical industry contends that PFAS are essential for many applications, arguing against sweeping bans.⁸

The EU is now contemplating a proposal to restrict the production, marketing and use of all PFAS, an unprecedented move to address the persistence and widespread impact of these dangerous chemicals comprehensively. This proposal faces significant pushback from industry stakeholders who claim that such broad restrictions could stifle technological progress.

However, the long-term costs of unchecked PFAS contamination – health care expenses, environmental remediation and loss of biodiversity – far outweigh the short-term economic benefits. Socially, communities affected by PFAS pollution face diminished quality of life, health crises and economic hardships, underscoring the necessity of prioritizing public health over industrial convenience.

The film highlights the plight of communities like Dordrecht in the Netherlands, which are struggling with severe consequences of PFAS pollution. Chemours, a major PFAS producer, has left its mark on the region, leading to extensive environmental contamination.⁹

Local authorities have taken legal action against Chemours, asserting that the company knowingly polluted the environment, posing significant health risks to residents. This legal battle mirrors the infamous case against [DuPont in West Virginia](#), where decades of PFAS discharge resulted in extensive health issues and a protracted legal struggle, ultimately leading to substantial compensation payouts.

Will Innovative Solutions and Industry Shifts Eliminate PFAS?

Despite the daunting challenges, there are glimmers of hope as some industries seek alternatives to PFAS. Firefighting foam is being reformulated to exclude PFAS, and certain companies are pioneering PFAS-free sportswear, demonstrating that effective, durable alternatives are possible. Further, the transition to PFAS-free alternatives is gaining momentum in sectors like refrigeration and heating.

Startups are also developing PFAS-free fuel cells, innovations that signify a shift toward reducing dependency on PFAS, driven by both regulatory pressures and growing environmental consciousness. Transitioning away from PFAS is not without its challenges, however.

Fluoropolymers, used in many high-tech applications, rely on the unique properties of PFAS, making their replacement a complex task. For instance, fuel cells used in hydrogen technologies depend on PFAS-based membranes for efficiency and durability.

While alternatives are being developed, scaling these solutions to meet industry demands requires significant investment and time.¹⁰

Addressing existing PFAS contamination is also a monumental task. Techniques like soil washing, which involves rinsing contaminated earth with clean water to extract PFAS, are being implemented in hotspots like NATO airfields in Germany.¹¹

However, this method is not universally applicable, especially in regions with clay-like soil that resists washing. The scale of contamination – 700,000 to 800,000 tons of PFAS-laden soil – poses logistical and financial challenges. Comprehensive cleanup efforts demand high levels of coordination, funding and technological innovation.

PFAS Are Triggering a Public Health Crisis

PFAS are not just an environmental issue – they're a public health crisis. Studies have shown that virtually every individual has PFAS in their blood, primarily through consumption of contaminated food and water. For instance, in the U.S., PFAS have been found in 97% of Americans.¹²

However, the PFAS dilemma extends beyond national borders, necessitating a coordinated global response. While the EU is taking strides to restrict PFAS, comprehensive global regulations are imperative to prevent these chemicals from simply relocating to less regulated regions.

A global convention on PFAS, the film notes, could ensure that production and usage are controlled universally, addressing the root cause of environmental and health issues rather than merely shifting the problem geographically. The U.S. Environmental Protection Agency recognizes that exposure to PFAS is detrimental and cites peer-reviewed scientific research indicating that PFAS exposure may lead to:¹³

Reproductive effects such as decreased fertility or increased high blood pressure in pregnant women

Developmental effects or delays in children, including low birth weight,

accelerated puberty, bone variations or behavioral changes

Increased risk of some cancers, including prostate, kidney and testicular cancers

Reduced ability of the body's immune system to fight infections, including reduced vaccine response

Interference with the body's natural hormones

Increased cholesterol levels and/or risk of obesity

Additionally, PFAS are known to speed up metabolic changes that result in fatty liver disease. Researchers noted in *Environmental Health Perspectives*, "This bioaccumulation, coupled with the long half-lives of many PFAS, leads to concern about the potential for PFAS to disrupt liver homeostasis should they continue to accumulate in human tissue even if industrial use is abated."¹⁴

Moreover, PFAS exposure induces inflammation and oxidative stress in youth, leading to various health issues such as obesity, insulin resistance and a higher risk of fatty liver disease and cancer.^{15,16}

How to Protect Your Health from PFAS

Expect to find PFAS in many household items, including stain- and water-repellent fabrics, cleaning products, nonstick cookware, paints and even your drinking water. Common sources of PFAS exposure include fast food containers, microwave popcorn bags, pizza boxes and candy wrappers.¹⁷

Additionally, PFAS is often found in processed foods like pasta and tomato sauces, as well as in personal care products such as sports bras and period underwear.¹⁸ A major concern is the contamination of agricultural land, often described as a "slow-motion disaster,"¹⁹ due to the use of toxic human waste sludge as fertilizer. It's estimated that around 20 million acres of U.S. farmland may be affected by PFAS contamination.²⁰

While foods grown with PFAS-contaminated sewage sludge aren't labeled as such, you can reduce your exposure by supporting local sustainable agriculture initiatives. Choose to buy from trusted sources that utilize safe, nontoxic organic or biodynamic farming methods. Additionally, focusing on fresh, whole foods helps minimize your intake of these chemicals found in processed food packaging.

Filtering your drinking water is another important step to eliminate PFAS. The New Jersey Drinking Water Quality Institute recommends using granulated activated carbon or similarly effective technologies to remove contaminants like PFOA and PFOS from your water supply. Activated carbon filters eliminate about 90% of these harmful chemicals.²¹

Reverse osmosis systems also offer some protection by removing PFAS, though they may not capture all types.²² More strategies to reduce your exposure to these persistent chemicals include:²³

Avoid pretreated or stain-resistant products — Steer clear of [stain-repellent treatments on clothing](#), furniture and carpets. Items labeled as "breathable" often contain polytetrafluoroethylene (PTFE), a synthetic fluoropolymer.

Choose flame-retardant-free materials — Opt for furniture, carpets, mattresses and baby products made from naturally less flammable materials like leather, wool and cotton instead of those treated with flame-retardant chemicals.

Limit fast food and takeout — The packaging used for these foods is typically treated with PFAS.

Switch from microwave popcorn — PFAS migrates from the inner coatings of microwave popcorn bags into the oil during heating. Instead, make popcorn using stovetop methods with non-GMO kernels.

Use safe cookware — Replace nonstick pans and other treated kitchen utensils with healthier alternatives such as ceramic or enameled cast iron cookware, which are durable, easy to clean and free from harmful chemical releases.

Select PFAS-free personal care products — Avoid products containing PTFE, "fluoro" or "perfluoro" ingredients, such as certain dental flosses like Oral B Glide. The Environmental Working Group's Skin Deep database is an excellent resource for finding safer personal care options.²⁴

While adopting these practices will help significantly reduce your exposure to PFAS, safeguarding your health, the battle against PFAS contamination is emblematic of the broader conflict between industrial progress and environmental stewardship. It calls upon each of us to remain informed, advocate for stringent regulations and support sustainable innovations.

The persistence of PFAS in our environment is a stark reminder of the long-term consequences of chemical misuse. However, with concerted effort and conscious choices in day-to-day life, we'll dismantle the pervasive influence of forever chemicals and foster a world where health and sustainability prevail.

Sources and References

- ^{1, 5, 8, 9, 10, 11} [YouTube, DW Documentary, Toxic and Tenacious – How 'Forever Chemicals' Are Damaging Our Health July 26, 2024](#)
- ^{2, 15} [Environmental Health Perspectives, Volume 131, Issue 2, February 22, 2023](#)
- ³ [National Cancer Institute, PFAS Exposure and Risk of Cancer](#)
- ⁴ [European Commission, September 18, 2024](#)
- ⁶ [U.S. EPA, PFAS Analytic Tools](#)
- ⁷ [Alliance for Natural Health USA, PFAS in Kale Pilot Study](#)
- ¹² [NIH, National Institute of Environmental Health Sciences, PFAS](#)
- ^{13, 17} [U.S. EPA, Our Current Understanding of the Human health and Environmental Risks of PFAS](#)
- ¹⁴ [Environmental Health Perspectives April 27, 2022, Introduction](#)
- ¹⁶ [CNN March 20, 2023](#)
- ¹⁸ [NPR, January 19, 2023](#)
- ¹⁹ [The Maine Monitor, March 13, 2022](#)
- ²⁰ [The Guardian, May 8, 2022](#)

- ²¹ New Jersey Drinking Water Quality Institute, Recommendation on Perfluorinated Compound Treatment Options for Drinking Water
- ²² TIME March 15, 2023
- ²³ EWG's Guide to Avoiding PFAS Chemicals, January 15, 2018
- ²⁴ Environmental Working Group Skin Deep Database