



PFAS (Forever Chemicals): Impact on Vitamin D and Human Health

This comprehensive document from VitaminDWiki.com presents extensive research spanning **2019-2025** documenting the harmful effects of Per- and Polyfluoroalkyl Substances (PFAS) on vitamin D metabolism and overall human health. The compilation includes approximately **22 studies and reports** showing consistent evidence that PFAS chemicals interfere with vitamin D function and contribute to numerous health problems.

Key Health Impacts

Vitamin D Disruption: Multiple studies demonstrate that PFAS chemicals significantly reduce vitamin D levels and block vitamin D receptor (VDR) function. The most recent research from March 2025 involving 2,114 postmenopausal women found that elevated PFAS concentrations were associated with substantially lower 25(OH)D levels and increased odds of vitamin D deficiency.

Diabetes Risk: A September 2025 study revealed that PFAS exposure increased diabetes risk by **31%** four years later, highlighting the long-term metabolic consequences of these chemicals.

Bone Health: Research consistently shows PFAS exposure reduces bone density and increases fracture risk. A 2019 study of young men in PFAS-polluted areas found **23.6%** had medium-high fracture risk compared to only **9.7%** in control groups.

Major Research Findings

The **2025 postmenopausal women study** using NHANES data (2003-2018) provided the strongest evidence for PFAS-vitamin D interactions. Researchers found significant associations between four PFAS compounds (PFOS, PFOA, PFNA, PFHxS) and reduced vitamin D levels, with effects varying by race, income, and survey period.

A **Swedish study** (2023) using advanced mass spectrometry detected strong correlations between PFAS exposure and vitamin D3 metabolites in blood samples, providing mechanistic evidence for how these chemicals disrupt vitamin D metabolism.

Computational modeling studies (2022) predicted that numerous PFAS chemicals may interfere with vitamin D receptor function, potentially leading to increased osteoporosis and impaired immune function.

Widespread Exposure Sources

The document reveals alarming contamination across consumer products:

- **65%** of bandages contain PFAS that can directly enter the body through wounds
- Fast food containers, microwave popcorn bags, and nonstick cookware
- **700 foods** in San Francisco contain measurable plastic compounds
- Sewage-based fertilizers contaminating farmlands
- Personal care products including dental floss and tampons

Corporate Cover-up and Regulatory Response

The document exposes that **DuPont and 3M hid PFAS studies for 40 years**, using tactics similar to the tobacco industry. Despite mounting evidence, the FDA only requires spill reporting but hasn't banned PFAS in foods. However, several countries including European nations, Australia, New Zealand, and Japan have implemented PFAS restrictions.

Economic and Health Burden

Research estimates PFAS exposure costs Americans **\$5.5-63 billion** in healthcare costs over the current population's lifetime, linked to 13 medical conditions including childhood obesity (\$2.7 billion) and hypothyroidism in women (\$1.26 billion).

Prevention Strategies

The Environmental Working Group provides guidance for avoiding PFAS exposure by choosing products without stain-resistant treatments, avoiding fast food containers, using ceramic cookware instead of nonstick, and selecting personal care products without "fluoro" or "perfluoro" ingredients.

The document suggests that **iodine supplementation** may help reduce fluorine toxicity, noting that iodine levels have decreased significantly over the past 30 years due to changes in food processing and salt storage.

This compilation represents one of the most comprehensive reviews of PFAS-vitamin D interactions, with the page receiving **9,751 visits**, indicating significant public interest in understanding these "forever chemicals" and their health impacts.

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