Executive Summary

Per- and Polyfluoroalkyl Substances in Food and Their Contribution to Human Exposure (Current Opinion in Food Science, 2025)

This review examines how food contributes to human exposure to per- and polyfluoroalkyl substances (PFAS) and evaluates the evidence linking dietary habits to PFAS concentrations measured in human blood. The authors combine findings from food contamination studies, dietary exposure assessments, and large-scale human biomonitoring programmes across Europe and internationally.

The review concludes that food remains one of the most important exposure pathways for PFAS in the general population. Although drinking water contamination can be significant in highly affected areas, dietary intake is considered the dominant source of exposure to long-chain PFAS compounds for most people.

The authors highlight that fish and seafood are consistently identified as the largest contributors to dietary PFAS exposure. Human biomonitoring studies repeatedly demonstrate that individuals who consume fish and seafood more frequently tend to have higher concentrations of PFAS in their blood. Consumption of eggs, offal (such as liver and kidney), and certain meat products has also been associated with elevated PFAS levels.

Conversely, diets containing larger amounts of fruit, vegetables, and dietary fibre are generally associated with lower concentrations of long-chain PFAS in blood. Several studies reviewed found that individuals consuming more plant-based diets, including vegans, often had lower PFAS body burdens than those consuming larger amounts of animal-derived foods.

The review confirms that PFAS contamination of food can occur through multiple environmental pathways, including:

- Contaminated soil.
- Contaminated groundwater and irrigation water.
- Atmospheric deposition onto crops.
- Contaminated animal feed.
- Biosolids and agricultural amendments.
- Food processing and packaging materials.
- Food contact materials and non-stick cookware.

The authors emphasise that PFAS contamination is not limited to industrially produced foods. Human biomonitoring studies demonstrate that consumption of locally produced food can be associated with higher PFAS exposure when food is grown in contaminated environments. European studies found that people consuming locally produced vegetables, eggs, fish, and other foods from contaminated areas often had significantly higher PFAS concentrations in their blood.

Of particular relevance, the review highlights evidence that home-produced eggs, locally caught fish, and food grown near fluorochemical facilities can become important exposure pathways. Several studies demonstrated that PFAS concentrations in food products decrease with increasing distance from contamination sources.

The review also discusses plant uptake of PFAS. Short-chain PFAS such as PFBA are described as highly mobile compounds that readily move from soil into crops and can accumulate in edible plant tissues. Long-chain compounds such as PFOS are more likely to accumulate in roots and root vegetables. The authors note that vegetables generally contain lower concentrations of PFAS than fish, seafood, eggs, and offal, but because vegetables are consumed frequently and in large quantities they remain an important component of dietary exposure assessments.

Another important finding is that food packaging and food processing may contribute to human exposure. PFAS are known to occur in some food-contact materials, takeaway containers, wrappers, coatings, and packaging products. Human biomonitoring studies have reported associations between consumption of packaged or processed foods and increased PFAS concentrations in blood, although the exact contribution remains incompletely understood.

The authors conclude that a proportion of the population continues to exceed health-based guidance values for PFAS exposure. They call for improved monitoring of food, better understanding of contamination pathways, stronger control of environmental emissions, and targeted advice for communities living in contaminated areas where locally produced foods may represent a significant source of exposure.

Overall, the review supports the conclusion that PFAS contamination of food is a genuine and measurable route of human exposure. While fish, seafood, eggs, and offal appear to contribute the largest individual exposures, locally produced foods grown in contaminated environments can also become significant exposure pathways. Continued research, monitoring, and risk assessment are required to better understand and manage these risks.