



FOOD SAFETY 101

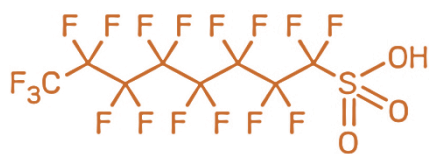
PFAs – per and poly-fluoroalkyl substances

Background

Per- and polyfluoroalkyl substances (PFAS) are a group of over 4,000 man-made chemicals used in a variety of industries because of their ability to resist oil, water, heat, and stains. These chemicals persist in the environment and the human body if ingested.

The PFAS chemicals

PFAS chemicals include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), and perfluorohexane sulfonate (PFHxS).



Perfluorooctanesulfonic acid

These substances are mobile in water, migrate long distances from their source, and do not fully break down in the environment. They fit into the class of what are known as “forever chemicals”.

Where are PFAS found?

Due to their non-stick, stain-repellent, and waterproof properties, PFAS have been used in everyday products such as cookware, cardboard packaging for fast food, stain repellents (for furniture, carpets, textiles, and garments), and in personal care products.

Previously, firefighting foams contained PFOS and PFOA as active ingredients because of their heat-resistant and film-forming properties in water. They were used extensively at airports, military bases, and other sites where firefighting training was conducted or where fire suppression systems were in place. From 2004, PFOS and PFOA were phased out of legacy

firefighting foams, however contaminated sites may be found across Australia.

Health impacts

The persistence mobility, and toxicity of PFAS in the environment is of global concern given their prevalence most people have been exposed to some level of PFAS, and they can accumulate in the human body.

The scientific literature on the public health effects of PFAS is largely inconclusive. Understanding of the effects of PFAS is evolving, but evidence suggests exposure to PFOA and PFOS above certain levels may result in adverse health effects including low birth weights, effects on the immune system, thyroid hormone disruption, and certain types of cancer.

Exposure of fresh produce

Food may be exposed to low levels of PFAS through:

- Contaminated soil and water during growing
- Contact with packaging containing PFAS
- Equipment that used PFAS during food processing.

Greatest concerns exist where foods including meat, offal, milk, and some vegetables are grown or sourced from or near contaminated sites.

For example, PFAS contamination of soil is mainly a result of contamination from irrigation water or soil conditioners. Absorption by plants varies according to the plant, PFAS type and concentration, and growth media (hydroponics vs. soil).



The Commonwealth and state and territory governments have developed the [National PFAS Position Statement](#), (5 May 2020) requiring more effort to be focused on preventing further PFAS releases into the environment. Industry participants were required to inform themselves about the presence of PFAS in their products, and phase them out where possible.

A recent study (2021) undertaken by the Australian Packaging Covenant Organisation (APCO) & Planet Ark with the support of the Australian Institute of Packaging (AIP) investigated the presence of PFAS in a large range of fibre-based (cardboard and paper) food packaging products available in Australia. The results confirmed the presence of PFAS significantly above background levels in almost a third of the samples tested, and their concentrations were consistent with those found in comparable similar studies in the US, UK, and the EU.

The testing for the total organic fluorine (TOF) content undertaken indicated the presence of PFAS. TOF levels greater than 800ppm indicate high concentrations of PFAS and low TOF levels (<100ppm) indicated low/no PFAS. High TOF concentrations are an indicator of intentionally added PFAS to the packaging.

The rate at which PFAS migrates from packaging to food contents is dependent on the temperature, acidity, storage time and fat content of the packaged food (Begley et al, 2008).

The APCO '[Action Plan to Phase Out PFAS in Fibre-Based Food Contact Packaging](#)' (September 2022) outlines a national, industry-led approach to phasing out per- and polyfluoroalkyl

substances (PFAS) in fibre-based food contact packaging by 31 December 2023.

The [Planet Ark report](#) "The Health and Environmental Risks of PFAS: A Focus on Food Contact Packaging" (May 24th, 2022), recommends a precautionary principle for individuals to limit their exposure to products that are likely to contain PFAS and look for 'no added PFAS' verification.

For businesses, the report recommends a precautionary principle to avoid selling and using products that contain PFAS chemicals and seek verification of the absence of PFAS from their raw materials.

Summary

While dietary exposure to PFAS is low in Australia, food businesses should maintain vigilance on potential issues, manage existing contamination, and prevent further contamination from PFAS.

References

- Australian Government. [Per- and Polyfluoroalkyl Substances \(PFAS\) – Australian information portal](#)
- Australian Government Department of Defence. [PFAS Investigation & Management Program](#)
- Australian Government Department of Health. [Health Based Guidance Values for Per- and Poly-Fluoroalkyl Substances \(PFAS\)](#)
- Begley, T. H., Hsu, W., Noonan, G., & Diachenko, G. (2008). Migration of fluorochemical paper additives from food-contact paper into foods and food simulants. *Food Additives and Contaminants*, 25(3), 384–390.

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