

PFAS, PTFE & PFOA in Nonstick Cookware

What the science says, the five habits raising your exposure, and the cookware actually worth replacing it with.

96% of US adolescents have detectable PFAS in serum (CDC NHANES, 2025)	500°F temperature at which PTFE coatings begin to break down (260°C)	Group 1 IARC carcinogen classification for PFOA, December 2023	2.3M microplastic particles released from one cracked nonstick pan (Flinders, 2022)
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EXECUTIVE SUMMARY

Polytetrafluoroethylene (PTFE) — sold under brand names like Teflon — is the slick coating on most nonstick cookware. PTFE itself is part of the broader chemical family known as PFAS (per- and polyfluoroalkyl substances). In December 2023, IARC classified PFOA — historically a key processing aid in PTFE manufacture — as a Group 1 (carcinogenic to humans) carcinogen, the same tier as tobacco and asbestos. PFOA has been phased out of US production since 2015, but legacy contamination, GenX-style replacements, and routine off-gassing of intact PTFE above 500°F (NRDC) all keep nonstick cookware in the public-health conversation. This guide synthesizes EPA, FDA, WHO/IARC, ATSDR and EFSA guidance with peer-reviewed studies from 2020–2025 to give you a clear picture of risk, the five habits that raise it, and which cookware to use instead.

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How to Use This Guide

If you only have five minutes, jump to **Section 04** (the five risky habits) and the **infographic checklist** on page 9 — together they cover the practical changes that meaningfully reduce exposure. Sections 01–03 give the scientific and regulatory foundation; sections 06–08 help you choose replacement cookware and understand label claims. Every factual claim is footnoted to a primary source listed in section 09.

A note on certainty. The science around PFAS is evolving quickly. Where authorities or studies disagree, this guide says so. Where evidence is firm — like the IARC Group 1 classification of PFOA, the PTFE breakdown threshold near 500°F, or the EPA's 4 ppt drinking-water MCL — that's noted too.

01 · What PFAS, PTFE and PFOA Actually Are

These three acronyms get used interchangeably, but they describe different things at different scales — and knowing the difference matters when you read brand label claims like “PFOA-free.”

THE FAMILY

PFAS

Per- and polyfluoroalkyl substances — a class of **over 14,000** synthetic chemicals built around extraordinarily strong carbon-fluorine bonds. Used since the 1940s for stain, water and grease resistance. Nicknamed “forever chemicals” because they don’t meaningfully break down in the environment or the human body.¹

THE COATING

PTFE

Polytetrafluoroethylene — the polymer (long-chain) PFAS that gives nonstick pans their slippery surface. PTFE is solid plastic, considered chemically inert at typical cooking temperatures, but begins to **thermally decompose around 500°F (260°C)**, releasing PFAS-containing fumes and particles.^{2,3}

THE PROCESSING AID

PFOA

Perfluorooctanoic acid — a short-chain PFAS once used to manufacture PTFE. Phased out of US production by 2015 under EPA’s Stewardship Program. In **December 2023, IARC classified PFOA as a Group 1 carcinogen** (carcinogenic to humans), with sufficient evidence in animals and limited evidence linking it to renal cell and testicular cancer.⁴

How they connect

PFOA was historically used as a manufacturing aid to make PTFE. Today, virtually all major nonstick brands sold in the US are labeled “PFOA-free,” reflecting the post-2015 phase-out — but the underlying coating is still PTFE, which is itself a PFAS.⁵ That distinction is why advocacy groups like [EWG](#) and [NRDC](#) consider “PFOA-free” a minimum standard, not a guarantee of safety. It also explains why some PFAS-replacement chemistries (like GenX/HFPO-DA used as a PFOA substitute) are now themselves regulated under the EPA’s 2024 drinking-water rule.⁶

The numbers that frame the conversation.

14,000+	4 ppt	500°F	Group 1
PFAS chemicals identified globally ¹	EPA enforceable MCL for PFOA & PFOS in drinking water (2024 rule) ⁶	PTFE thermal decomposition threshold (260°C) ^{2,3}	IARC carcinogen classification for PFOA (Dec. 2023) ⁴

Sources · Section 01. ¹ EPA: Health risks of PFAS. ² NRDC — Why Nonstick Pans Are a Hot Mess. ³ PureCook — PFAS & PTFE in Cookware. ⁴ IARC December 2023 reclassification. ⁵ EWG — Avoiding PFAS Chemicals. ⁶ EPA Final PFAS Drinking Water Rule.

02 · Where Health Authorities Stand

Five major regulatory and scientific bodies have issued substantive findings on PFAS exposure in the past five years. Their positions are converging — but they differ on scope, urgency, and what specifically counts as evidence.

Authority	Position / Action	Year	Specific Threshold or Finding
EPA US Environmental Protection Agency	First-ever enforceable drinking-water limits for six PFAS under the National Primary Drinking Water Regulation. Designated PFOA and PFOS as CERCLA hazardous substances . ^{1,2}	2024	PFOA & PFOS: 4 ppt MCL ; PFNA, PFHxS, HFPO-DA: 10 ppt; MCLG of zero for PFOA/PFOS. Compliance: 2027/2029.
FDA US Food and Drug Administration	PTFE remains authorized for food contact under 21 CFR § 177.1550. Completed voluntary phase-out of PFAS grease-proofing agents from paper food packaging. ^{3,4}	Feb 2024	FDA states migration to food from intact nonstick coatings is “negligible” at normal cooking temperatures, with extractability limits in the regulation.
WHO / IARC Int'l Agency for Research on Cancer	Reclassified PFOA as Group 1 carcinogen (carcinogenic to humans) and PFOS as Group 2B (possibly carcinogenic). Volume 135 monograph published Feb. 2025. ⁵	Dec 2023	Sufficient animal evidence for PFOA; limited human evidence for renal-cell & testicular cancer. PFOA now in same hazard tier as tobacco smoke.
ATSDR / CDC / NIEHS US health-research agencies	Maintain comprehensive Toxicological Profile linking PFAS to multiple non-cancer outcomes; NTP designated PFOA & PFOS immune hazards in humans. ^{6,7}	2021–2024	Evidence: ↑ cholesterol, ↓ infant birth weight, ↓ vaccine response in children, kidney/testicular cancer signals, pregnancy-induced hypertension, thyroid disease, liver enzyme effects.
EFSA European Food Safety Authority	Set tolerable weekly intake (TWI) for the sum of four PFAS (PFOA + PFOS + PFNA + PFHxS), based on immunotoxicity (suppressed vaccine antibody response). ⁸	2020	4.4 ng/kg body weight per week . EFSA notes a substantial portion of the European population already exceeds this TWI through diet alone.

IARC carcinogen classifications, in context

Group 1 Carcinogenic to humans	Group 2A Probably carcinogenic	Group 2B Possibly carcinogenic	Group 3 Not classifiable
PFOA · tobacco · asbestos · processed meat · UV radiation	Glyphosate · red meat · night shift work	PFOS · talc · aloe vera extract	Caffeine · tea · static magnetic fields

Sources · Section 02. ¹ EPA Drinking Water Rule. ² EPA CERCLA designation. ³ FDA authorized uses of PFAS. ⁴ FDA Feb 2024 phase-out. ⁵ IARC Volume 135. ⁶ ATSDR clinician overview. ⁷ NIEHS PFAS topics. ⁸ EFSA TWI 2020.

03 · The Cancer & Health–Effects Evidence

The scientific case linking PFAS exposure to specific health outcomes has firmed up considerably since 2020. These are the most rigorous studies and reviews — peer-reviewed cohort analyses, meta-analyses, and the IARC monograph.

Cancer endpoints (peer-reviewed evidence, 2020–2024)

Cancer site	Strongest finding	Study / Source
Renal cell carcinoma (kidney)	+71% RCC risk per doubling of serum PFOA; OR 2.63 in highest quartile vs. lowest.	Shearer et al., JNCI 2020
Renal cell carcinoma — racial disparity	PFNA → RCC odds ratio 3.69 in Black Americans (Multiethnic Cohort).	Rhee et al., Environ Int 2023
Testicular cancer	IARC: <i>limited</i> human evidence supporting causal link with PFOA exposure.	IARC Volume 135 (2025)
Thyroid cancer	Relative risk 1.69 in NH community with PFAS-contaminated water.	Locwin et al., Environ Health Insights 2022
Breast / female cancers	Pooled meta-analysis: PFOA → breast cancer RR 1.08; PFAS → ovarian RR 1.07.	Kappil et al., Med Lav 2024
Multiple cancer sites	ACS Cancer Prevention Study II (2023): PFOA → RCC in women; PFHxS → CLL/SLL in men.	Troeschel et al., EHP 2023

Non-cancer endpoints

Outcome	Effect	Study
LDL cholesterol	PFAS mixture → elevated LDL trajectory OR 1.79 in midlife women (SWAN cohort, 14.8-yr follow-up).	EHP 2023
Pregnancy-induced hypertension	PFOA → odds ratio 1.51; PFAS mixture OR 1.43 (Project Viva, US).	Environ Int 2022
Lower birth weight	Per In-unit serum PFOA: –68 g overall, –86 g in girls (SELMA Swedish cohort).	Pediatr Res 2019
Decreased vaccine response (children)	2× PFAS → –49% antibody concentration at age 7 (Faroe Islands, foundational JAMA study).	Grandjean et al., JAMA 2012
Liver injury (children, prenatal exposure)	Prenatal PFAS exposure linked to elevated child liver enzymes (HELIX, 6 European cohorts).	Hepatology 2020
Population biomonitoring	>96% of US adolescents have ≥4 PFAS detectable in blood serum (NHANES).	CDC NHANES 2025

04 · The 5 Habits That Increase Your Exposure

If your cookware is intact, used at moderate temperatures, and replaced when damaged, the realistic risk from a PFOA-free PTFE pan is low. The risk goes up sharply when one or more of these five habits enter the routine.

01 Preheating an empty nonstick pan

●●●●● HIGH RISK · 5/5

WHY IT MATTERS

An empty PTFE pan on high heat reaches **500°F in 2–3 minutes** and can hit 660–750°F in 2–5 minutes — well into the range where PTFE thermally degrades and releases PFAS-containing fumes. EWG documented this in its *Canaries in the Kitchen* testing, and it remains the most common cause of so-called “Teflon flu” (polymer fume fever) in humans and pet bird deaths.

SAFER PRACTICE

Always add oil or food before turning on the burner. If you must preheat, do it on low or medium heat and never longer than 1–2 minutes.

SOURCES

EWG *Canaries in the Kitchen*; NRDC; Everyday Materials

02 Cooking on high heat or searing on nonstick

●●●●● HIGH RISK · 5/5

WHY IT MATTERS

PTFE begins molecular breakdown above **500°F (260°C)**; by 660°F (350°C) it sheds toxic particulates including TFA and PFIB. Searing steak, stir-frying, or broiling routinely exceed this threshold. NSF International researchers describe high-heat searing on nonstick as the single biggest avoidable exposure pathway in normal cooking.

SAFER PRACTICE

Reserve nonstick for low- and medium-heat cooking (eggs, crepes, delicate fish). Sear on stainless, cast iron, or carbon steel — all of which actually develop better fond than nonstick anyway.

SOURCES

Food & Wine; Misen; PureCook

03 Using metal utensils on the coating

●●●●● HIGH RISK · 4/5

WHY IT MATTERS

The Flinders/Newcastle 2022 study (peer-reviewed in *Science of the Total Environment*) found that a **single scratch** from a metal utensil released roughly **9,100 PTFE particles into food**; broken coating released up to 2.3 million. These end up ingested directly.

SAFER PRACTICE

Use silicone, wood, or nylon utensils only. Be especially careful with whisks and metal spatulas — they're the most common scratching culprits.

SOURCES

Luo et al., *Sci. Total Environ.* 2022; Flinders University News

04 Using chipped, peeling or visibly damaged pans

●●●●● HIGH RISK · 5/5

WHY IT MATTERS

Once the coating is breached, PTFE flakes can shed into food at every use, and the underlying metal substrate (often aluminum) comes into direct contact with food. Damaged enamel (in enameled cast iron) is similarly unsafe — Le Creuset's own care instructions explicitly warn against using cookware with chipped enamel.

SAFER PRACTICE

Replace any nonstick pan showing flaking, bubbling, peeling, deep scratches or discoloration. Most consumer nonstick has a 3–5 year functional life span — plan to replace, not repair.

SOURCES

[Consumer Reports](#); [Le Creuset Care & Use](#)

05 Abrasive cleaning, dishwashing & stacked storage

●●●●● MODERATE · 3/5

WHY IT MATTERS

Steel wool, scouring powders, dishwasher detergent, and rapid temperature shock (e.g., rinsing a hot pan in cold water) all accelerate coating wear. Stacking pans without protection creates abrasion every time you pull one out. Each of these multiplies the risk in habits #3 and #4.

SAFER PRACTICE

Hand-wash with a soft sponge and mild detergent. Let pans cool fully before washing. Use felt or silicone pan protectors when stacking, or hang pans on a rack.

SOURCES

[Misen](#); [Straight Up Food](#)

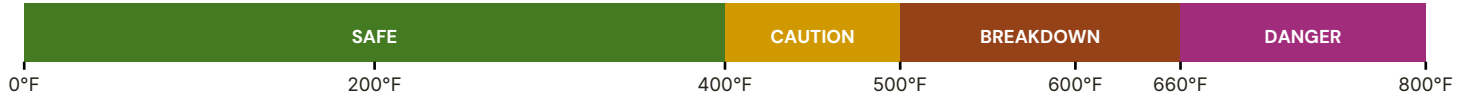
Quick comparison: risky vs. safer practice

Habit	Risky version	Safer version	Why it matters
Heat level	High heat / searing on PTFE	Low-medium heat ($\leq 400^{\circ}\text{F}$ surface)	PTFE breaks down $\geq 500^{\circ}\text{F}$
Preheating	Empty pan over high flame	Always with oil or food added first	Empty pans hit $660^{\circ}\text{F}+$ in minutes
Utensils	Metal whisks, spatulas, forks	Silicone, nylon, or wood	9,100 particles per scratch
Damaged pans	Continuing use after chips/flakes	Replace at first sign of damage	Up to 2.3M particles per pan
Cleaning	Steel wool, dishwasher, cold rinse on hot pan	Soft sponge, mild soap, cool first	Abrasion + thermal shock degrade coating
Storage	Stacked, no protection	Hung or with felt/silicone protectors	Stacking is constant low-grade abrasion
Ventilation	Cooking nonstick without exhaust fan	Run range hood on high while cooking	Reduces fume inhalation, esp. for pet birds

05 · Safer Kitchen Checklist

Pin this page to the fridge. The seven Do's lower exposure across all five risky habits at once; the six Don'ts capture the avoidable exposure paths.

PTFE Coating: Temperature Risk Zones



Sources: NRDC; Food & Wine (NSF); EWG Canaries in the Kitchen — empty pans hit 660–750°F in 2–5 min.

DO safer habits



Cook below 400°F

Eggs, crepes, fish, sauces — PTFE's wheelhouse.



Add oil or food before heat

Never preheat an empty nonstick pan.



Use silicone or wood utensils

Zero metal contact prevents particle release.



Run your range hood

Ventilation cuts fume exposure and pet-bird risk.



Hand-wash with soft sponge

No steel wool, no dishwasher, no cold rinse on hot pan.



Replace damaged pans promptly

Chips, flakes, bubbling = end of service life.



Keep a stainless or cast-iron skillet

Use it for searing, frying, anything above medium-high.

DON'T avoid these



Sear or broil on nonstick

Surface temps routinely pass the 500°F PTFE threshold.



Heat empty pans

An empty pan can reach 660°F+ in 2–5 minutes.



Use metal whisks or spatulas

Single scratch ≈ 9,100 PTFE particles in food.



Keep a flaking or peeling pan

Replace immediately — coating is shedding into every meal.



Stack unprotected cookware

Constant low-grade abrasion from stacking damages coating.



Trust "PFOA-free" as proof of safety

PFOA is gone; PTFE is still PFAS — habits matter more than label.

06 · Safer Cookware Alternatives

There is no single “best” cookware — different materials excel at different jobs. A practical kitchen mixes two or three. The table below summarizes the main PFAS-free options; detail follows.

Material	PFAS-free	Max temp	Nonstick	Durability	Cost	Best for
Stainless steel (304/18-10)	Yes	~600°F	Low (with technique)	Lifetime	\$-\$\$\$	Searing, sauces, deglazing, reductions
Seasoned cast iron	Yes	Unlimited*	Med (improves with use)	Generations	\$	Searing, baking, frying, slow cooking
Carbon steel	Yes	1,200°F	Med-High (seasoned)	Lifetime	\$\$	Stir-fry, eggs, omelets, searing
Ceramic-coated (sol-gel)	Most are†	~450–550° F	High (1–3 yrs)	Short	\$\$	Eggs, crepes, low-heat cooking
Enameled cast iron	Yes	~500°F	Low-Med	Lifetime	\$\$\$	Braising, soups, baking, slow cooking
Glass (Pyrex)	Yes	425°F (oven only)	Low	Long, brittle	\$	Casseroles, baking, storage
100% pure ceramic (Xtrema)	Yes	~2,500°F	Low-Med	Long, brittle	\$\$\$	Stovetop-to-oven, simmers, sauces

* Cast iron has no upper temperature limit but seasoning oils degrade above ~700°F. † “Ceramic nonstick” is almost always a sol-gel silica coating, not pure ceramic — see brand notes on next page.

Stainless steel

OVEN-SAFE TO ~600°F · COST \$-\$\$\$

The workhorse. 304 (also marked 18/10) is fully inert with food, dishwasher-safe, and indestructible. With proper preheating and oil, it browns and releases food beautifully.

PROS Lasts forever, no coating to fail, oven-safe, induction-compatible, dishwasher-safe.

CONS Less forgiving than nonstick — needs preheating and fat for release. Hot spots in cheap pans.

Seasoned cast iron

OVEN-SAFE TO Unlimited · COST \$

A 100-year-old skillet still works. Polymerized oil (the seasoning) creates a natural nonstick layer that improves with use. Adds dietary iron — a plus for many users.

PROS Practically immortal, oven and stovetop, retains heat brilliantly, naturally nonstick once seasoned.

CONS Heavy. Requires re-seasoning if neglected. Reactive with very acidic foods like long tomato simmers.

Carbon steel

OVEN-SAFE TO 1,200°F · COST \$\$

The chef's secret. Lighter than cast iron, heats faster, takes seasoning the same way. Used in restaurant kitchens for omelets and stir-fry.

PROS Lighter than cast iron, ovenproof to 1,200°F, develops nonstick patina, relatively affordable.

CONS Reactive while seasoning develops. Same care as cast iron — no soap soaks, no dishwasher.

Ceramic-coated (sol-gel)

OVEN-SAFE TO ~450–550°F · COST \$\$

What most “nontoxic ceramic” brands actually sell. A silica-based coating fired onto an aluminum pan. PFAS-free, but the coating wears out faster than PTFE — typically 1–3 years.

PROS Truly PFAS-free, attractive, very nonstick when new, oven-safe, often dishwasher-safe.

CONS Short lifespan, can lose nonstick quickly with high heat or metal utensils.

Enameled cast iron

OVEN-SAFE TO ~500°F · COST \$\$\$

Cast iron coated in a vitreous glass enamel. No seasoning needed and works with acidic foods. The classic Le Creuset/Staub Dutch oven.

PROS Beautiful, durable, oven-safe, no reactivity issues, lasts a lifetime.

CONS Heavy. Expensive at quality tier. Enamel can chip — replace if it does.

100% pure ceramic

OVEN-SAFE TO ~2,500°F · COST \$\$\$

Brands like Xtrema make pans from solid kiln-fired ceramic — no metal core, no coating. Highest heat tolerance of any cookware sold.

PROS Most truly inert option, dishwasher-safe, microwave-safe, exceptional thermal range.

CONS Heats slowly. Brittle — drops can crack it. Not a true nonstick surface.

07 · Safer Brands & Certifications

“PFOA-free” is the legal minimum in the US — every modern nonstick pan qualifies. The meaningful claim to look for is “**PFAS-free**” backed by independent testing. Below are the brands most consistently identified by Consumer Reports, EWG, and certified by NSF or GreenScreen as safer choices.

Decoding what's on the box

● PFOA-free	Legal baseline since 2015. The pan can still be PTFE (a PFAS).
● PTFE-free	No traditional Teflon coating. Usually a sol-gel “ceramic” coating instead.
● PFAS-free	Strongest claim. Verify the brand publishes third-party test results.
● NSF certified	Independent NSF International testing for material safety.
● GreenScreen	CEH/CPA joint certification — strict no-PFAS standard for cookware.
● MADE SAFE	Independent label that excludes PFAS, heavy metals, and known toxicants.
● Prop 65 compliant	California heavy-metal disclosure standard. Useful but not PFAS-specific.

Brand-by-brand quick reference

Brand	Cookware type	PFAS status	Key claim or certification
Caraway	Sol-gel ceramic-coated aluminum	PTFE/PFAS-free	California AB 1200 compliant; oven-safe to 550°F
GreenPan	Thermolon sol-gel ceramic	PTFE/PFAS-free	NSF-certified; no toxic fumes claimed up to 850°F
Our Place Always Pan	Sol-gel ceramic	PTFE/PFAS-free	PFOA, PFAS, lead, cadmium-free per published testing
Made In	Stainless, carbon steel, enameled CI	Inherently PFAS-free	5-ply stainless made in USA/France
All-Clad (stainless)	Tri-ply stainless steel	Inherently PFAS-free	Lifetime warranty; made in USA
Lodge	Cast iron, carbon steel, enameled CI	Inherently PFAS-free	Pre-seasoned with vegetable oil
Le Creuset	Enameled cast iron	Inherently PFAS-free	Lifetime warranty; replace if enamel chips
Xtrema	100% pure ceramic	Inherently PFAS-free	Quarterly third-party testing; Prop 65 compliant

Verify, don't trust. A 2025 Consumer Reports investigation found that one nonstick pan marketed as "PFOA-free" tested positive for PFOA contamination — a reminder that brand claims need third-party verification. See [Consumer Reports](#) and [GreenScreen Certified](#).

08 · Regulatory Landscape

Regulation of PFAS in cookware is moving fast — and unevenly. The US is leading on drinking water, while individual states (Maine, Minnesota, California) are the practical front line on cookware itself. The EU has the most ambitious proposal pending; France passed a partial ban that, after industry lobbying, exempted cookware.

Jurisdiction	Law / rule	Effect on cookware	Status
United States — Federal	EPA PFAS National Primary Drinking Water Regulation	Enforceable MCLs of 4 ppt for PFOA & PFOS in tap water; doesn't directly regulate cookware.	Final rule April 2024; compliance 2027/2029
United States — Federal	EPA CERCLA Superfund Designation	PFOA & PFOS designated hazardous substances; reporting obligation for releases ≥ 1 lb.	Effective July 8, 2024
United States — Federal	FDA voluntary phase-out of PFAS food packaging	Removed PFAS grease-proofing agents from US paper food packaging. PTFE cookware coatings remain authorized.	Completed February 2024
Maine	LD 1503 — "An Act to Stop PFAS Pollution"	Sale of cookware containing intentionally added PFAS prohibited; full state-wide ban by 2032.	Cookware ban effective Jan. 1, 2026
Minnesota	Amara's Law (SF 2932)	First US ban on PFAS in cookware, including PTFE/Teflon, already in effect.	Cookware ban effective Jan. 1, 2025
California	AB 1200 — Safer Food Packaging & Cookware Act	Cookware sold in CA must publicly disclose chemicals of concern (incl. PFAS) on label and online.	Labeling effective 2024
European Union	REACH Universal PFAS Restriction	Proposed restriction would cover PTFE and ~10,000 PFAS compounds; consumer cookware unlikely to receive a derogation.	ECHA opinions 2026; Commission decision expected 2027
France	Law 2025-188 / Decree 2025-1376	Bans PFAS in cosmetics, textiles, footwear from Jan. 2026 — cookware explicitly exempted after Tefal lobbying.	In force Jan. 1, 2026
Industry — voluntary	3M PFAS manufacturing exit	World's largest historical PFAS producer ended manufacture and use of all PFAS by end of 2025.	Completed 2025

What this means for consumers

If you live in **Minnesota**, retailers cannot sell new PFAS-containing cookware to you as of January 2025. **Maine** joins them in January 2026. **California** consumers have legally guaranteed disclosure on every cookware product sold there. Everywhere else, the practical effect of regulation is indirect — the EPA's drinking water rule pressures municipalities, the EU restriction is reshaping global supply chains, and the IARC Group 1 reclassification is driving the next wave of state and tort action.

The bottom line: federal regulation of PFAS in cookware itself is years away. Until then, the most powerful protective lever is your own kitchen — the habits, alternatives, and brand checks in this guide.

09 · Sources & Further Reading

Every numerical claim and specific finding in this guide is drawn from one of the primary sources below. All URLs were verified at the time of compilation (April 2026).

Health authorities — official guidance

1. EPA — PFAS National Primary Drinking Water Regulation (final rule, 2024). <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>
2. EPA — Designation of PFOA & PFOS as CERCLA hazardous substances. <https://www.epa.gov/epcra/designation-pfoa-and-pfos-hazardous-substances-under-cercla-release-reporting-requirements>
3. EPA — Our Current Understanding of Health and Environmental Risks of PFAS. <https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas>
4. EPA — PFAS Strategic Roadmap 2021–2024. <https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024>
5. FDA — Authorized Uses of PFAS in Food Contact Applications. <https://www.fda.gov/food/process-contaminants-food/authorized-uses-pfas-food-contact-applications>
6. FDA — PFAS Grease-Proofing Substances Phase-Out (Feb. 2024). <https://www.fda.gov/food/hfp-constituent-updates/fda-announces-pfas-used-grease-proofing-agents-food-packaging-no-longer-being-sold-us>
7. 21 CFR § 177.1550 — Perfluorocarbon resins (PTFE food-contact authorization). <https://www.law.cornell.edu/cfr/text/21/177.1550>
8. IARC — December 2023 reclassification of PFOA (Group 1) and PFOS (Group 2B). <https://www.iarc.who.int/news-events/iarc-monographs-evaluate-the-carcinogenicity-of-perfluorooctanoic-acid-pfoa-and-perfluorooctanesulfonic-acid-pfos/>
9. IARC Monographs Volume 135 (full publication, Feb. 2025). <https://www.iarc.who.int/news-events/iarc-monographs-volume-135-perfluorooctanoic-acid-pfoa-and-perfluorooctanesulfonic-acid-pfos/>
10. ATSDR — Health Effects for Clinicians (PFAS, 2024). <https://www.atsdr.cdc.gov/pfas/hcp/clinical-overview/health-effects.html>
11. ATSDR — Toxicological Profile for Perfluoroalkyls (NIH Bookshelf). <https://www.ncbi.nlm.nih.gov/books/NBK592143/>
12. NIEHS — PFAS Health Topics. <https://www.niehs.nih.gov/health/topics/agents/pfc>
13. EFSA — Tolerable weekly intake for sum of four PFAS (2020). <https://www.efsa.europa.eu/en/news/pfas-food-efsa-assesses-risks-and-sets-tolerable-intake>

Peer-reviewed studies — cancer

14. Shearer et al. — Serum PFOA & renal cell carcinoma (JNCI, 2020). <https://doi.org/10.1093/jnci/djaa143>
15. Rhee et al. — Multiethnic Cohort PFAS & RCC (Environment International, 2023). <https://doi.org/10.1016/j.envint.2023.108197>
16. Troeschel et al. — ACS Cancer Prevention Study II PFAS & cancer (EHP, 2023). <https://doi.org/10.1289/EHP13174>
17. Locwin et al. — Thyroid cancer in PFAS-exposed community (2022). <https://doi.org/10.1177/11786302221076707>
18. Seyyedsalehi & Boffetta — PFAS & kidney/liver/testicular cancer meta-analysis (2023). <https://doi.org/10.23749/mdl.v114i5.15065>
19. Kappil et al. — PFAS, breast and female genital cancer meta-analysis (2024). <https://doi.org/10.23749/mdl.v115i6.16330>
20. IARC Monograph evaluation summary (Lancet Oncology, 2023). [https://doi.org/10.1016/S1470-2045\(23\)00622-8](https://doi.org/10.1016/S1470-2045(23)00622-8)

Peer-reviewed studies — non-cancer endpoints

21. PFAS & LDL cholesterol trajectories — SWAN cohort (EHP, 2023). <https://doi.org/10.1289/EHP12351>
22. PFAS & pregnancy-induced hypertension — Project Viva (Environ Int, 2022). <https://doi.org/10.1016/j.envint.2022.107335>
23. PFOA & lower birth weight — SELMA cohort (Pediatric Research, 2019). <https://doi.org/10.1038/s41390-019-0720-1>
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Disclaimer. This guide is a research compilation for educational purposes and does not constitute medical advice. Individual exposure risk varies with diet, water source, geography, and personal health. Consult a healthcare provider for medical questions and your local water utility's Consumer Confidence Report for tap-water PFAS data.