THE HOME WATER FILTER DECISION GUIDE

Choose the right system — and know the true cost — before you buy

Do Your Own Math · doyourownmath.com

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This book is educational and independent. It recommends no specific brand, contains no paid placements, and earns nothing from any product you buy. The figures used are illustrative examples to teach a method — always use your own numbers and your own local prices. Water treatment can affect health; if you have a known contamination problem, confirm your choice against a certified laboratory test and the manufacturer's certified performance data before relying on it.

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Before you spend a euro

Most people buy a water filter the wrong way round. They pick a product first — the one a friend mentioned, or the one at the top of a search result — and only afterwards wonder whether it actually fixes their water, and what it will really cost to run. That order is expensive. A cheap-looking pitcher can cost more per litre over five years than an under-sink system, and an impressive-looking system can filter things you don't have while missing the one thing you do.

This guide flips the order. It starts with your water, matches the problem to the right type of system, shows you which certifications actually mean something, and then teaches you to calculate the true cost of ownership so you compare like with like. It recommends no brand and sells you nothing. By the end you will be able to walk into any shop, or open any product page, and judge it in a few minutes.

How to use it: read Chapters 1 to 4 once, in order — they build on each other. Chapters 5 and 6 are the ones you will come back to every time you compare a specific product. The quick-reference tables at the end are your cheat-sheet.

1. Start with your water, not the product

A filter can only be right or wrong relative to a problem. So the first job is to find out what is actually in your water. There are two honest sources, and they cost almost nothing.

Read your annual water-quality report

If you are on a municipal supply, your utility publishes a yearly report of what it tests for and what it found. It is usually free and available on request or online. It tells you the big picture: disinfection method (chlorine or chloramine), hardness, and any regulated contaminants near their limits. It does not tell you what happens between

the treatment plant and your tap — old lead service lines, for example — which is why a home test still matters.

Run an inexpensive home test

A basic test strip kit shows hardness, chlorine, pH and a few metals in minutes. For anything health-related — lead, arsenic, nitrates, bacteria — a mail-in laboratory test is worth the modest cost, because it measures your tap on your day. Test before you buy, not after.

The five problems most systems are bought to solve

- Taste and smell — usually chlorine or chloramine. A nuisance, not a health risk, but the most common reason people filter.
- Hardness (scale) — calcium and magnesium that fur up kettles and pipes. A softener or conditioner problem, not a drinking-water filter problem.
- Sediment and particulates — grit, rust, cloudiness. Often a pre-filter job.
- Dissolved health contaminants — lead, arsenic, nitrates, PFAS, certain VOCs. This is where certification matters most.
- Microbes — bacteria, viruses, cysts. Rare on treated municipal supplies, common on wells and untreated sources.

Write down which of these five you actually have. If you cannot point to one, you may not need a filter at all — and that is a valid, money-saving conclusion this guide is happy to reach.

2. The six system types, honestly

Almost everything on the market is a variation of six types. Here is what each one genuinely does, what it does not, and where its money goes.

Pitcher and dispenser filters

A jug with a carbon cartridge. Cheap to buy, no installation, good for taste and chlorine. Cartridges are small and need replacing often, so the running cost per litre is deceptively high. Best for one or two people who mainly want better-tasting water.

Faucet-mounted filters

Screw onto the tap; carbon-based. Slightly better capacity than a pitcher and filter on demand. They reduce flow and don't fit every tap. A reasonable middle step for taste and basic reduction.

Under-sink carbon filters

A cartridge plumbed under the sink feeding a dedicated tap or the cold line. Larger cartridges mean a lower cost per litre and longer intervals. Good for taste plus certified reduction of specific health contaminants, depending on the cartridge. Needs a simple installation.

Reverse osmosis (RO)

Pushes water through a membrane that removes the widest range of dissolved contaminants, including many that carbon cannot. The trade-offs: it wastes some water to drain, strips beneficial minerals (some units remineralise), is slower, and has more parts to maintain. The right tool for serious dissolved-contaminant problems; overkill if you only dislike the taste of chlorine.

Whole-house (point-of-entry) systems

Installed where water enters the home, so every tap and appliance benefits. Used for whole-home sediment, chlorine, or hardness. Higher upfront and installation cost, but large media beds last years, so running cost per litre can be low. A plumbing job, not a plug-in.

Ultraviolet (UV) disinfection

A lamp that inactivates bacteria and viruses. It does nothing for taste, chemicals or particles, so it is almost always paired with filtration and used on wells or untreated supplies. It uses electricity continuously — a running cost people forget.

3. Match the problem to the system

With your problem identified and the six types understood, matching is straightforward. Use this table as a starting point, then confirm the specific product carries the right certification (Chapter 4).

Your main problem	Sensible first choice	Usually overkill
Bad taste / chlorine smell	Pitcher, faucet, or under-sink carbon	Reverse osmosis
Lead or dissolved metals	Certified under-sink or RO	Whole-house carbon alone
Nitrates / PFAS / arsenic	Reverse osmosis (certified)	Basic pitcher
Sediment / cloudiness	Sediment pre-filter or whole-house	RO without a pre-filter
Hardness / scale	Softener or conditioner	Any drinking-water filter
Bacteria (well / untreated)	UV plus filtration	Carbon filter alone

Two rules save most people from a costly mistake. First, don't buy for a contaminant you don't have — a filter certified for fifty things you don't need is not better, just dearer to run. Second, don't ask one device to do two unrelated jobs; hardness and health contaminants are different problems with different equipment.

4. Certifications that actually mean something

The single most useful skill in this whole guide is reading a certification instead of a marketing claim. A phrase like "filters up to 99% of impurities" means nothing on its own — 99% of what, tested by whom? Independent standards answer that. The widely recognised ones are the NSF/ANSI standards.

- NSF/ANSI 42 — aesthetic effects: chlorine, taste and odour, chloramine, particulates, and metals such as iron, manganese and zinc. This is a "nicer water" standard, not a health one.
- NSF/ANSI 53 — health effects: over fifty possible reduction claims, including lead, cysts such as Cryptosporidium, VOCs and chromium. This is the one to look for when your problem is a health contaminant.
- NSF/ANSI 58 — reverse osmosis systems specifically, covering the RO process and claims such as dissolved-solids reduction.
- NSF/ANSI 55 — ultraviolet systems, for microbiological disinfection.
- NSF/ANSI 401 — emerging contaminants: up to fifteen, including pharmaceuticals, over-the-counter medicines and pesticides detected in supplies.

How to verify a claim: a genuine certification names the standard and the specific substances reduced — not just "NSF" on the box. Check the certifier's own online listing for the model number. If a product claims a health benefit but is only certified to Standard 42, treat the health claim as unproven.

Standards evolve and certifiers publish current details; when a health outcome matters, confirm the exact model against the certifier's live listing before you buy.

Source for the standard scopes above: NSF (nsf.org), NSF/ANSI 42, 53 and 401 filtration standards.

5. The true cost of ownership

Sticker price is the smallest part of what a filter costs you. The real number is the total cost of ownership — purchase plus installation plus every replacement filter and every kilowatt-hour, across the years you will own it — reduced to one comparable figure: the cost per litre.

The method

For each system, add the upfront price and installation once, then add the annual running cost multiplied by the number of years you plan to keep it. Divide that total by the litres you will actually use over the same period. The result — cost per litre — lets you compare a cheap pitcher against an expensive whole-house system on a single honest scale.

Annual running cost has two parts people underestimate. Filter cost is the replacement price times how many changes a year (twelve divided by the filter's life in months). Electricity cost applies to anything with a pump or a UV lamp: power in kilowatts times hours run per day times 365 times your electricity price.

A worked comparison

Take four systems for the same household using eight litres a day, over five years, at an electricity price of 0.30 per kWh. The pattern that emerges is typical, not a rule — run your own numbers.

System	Upfront + install	Yearly running	5-year total	Cost / litre
Reverse osmosis (under-sink)	330	180	1,230	0.084
Countertop pitcher	35	72	395	0.027
Whole-house	800	180	1,700	0.116

System	Upfront + install	Yearly running	5-year total	Cost / litre
filter				
UV purifier (with lamp)	230	106	759	0.052

Notice what the table exposes: the pitcher looks cheapest to buy and is cheapest per litre here — but only because it is doing the least. The whole-house system costs the most per litre yet protects every tap and appliance, which the pitcher cannot. Cost per litre is not a verdict on its own; it is the figure that lets you weigh price against what each system actually delivers.

Do this yourself in two minutes: the companion spreadsheet, the Water Filter True-Cost Calculator (see doyourownmath.com/water/guide/), has these formulas built in — enter up to four systems and it returns every figure in this table automatically.

How running costs get hidden

- Short-life cartridges sold at a low headline price, so the cost lands later and repeatedly.
- "Up to" filter-life figures measured on ideal water, not hard or heavily used supplies.
- Electricity for pumps and UV lamps left out of every comparison.
- Proprietary cartridges with no compatible alternative, locking in the running price.

6. The buying checklist

Before you pay, run the product past these questions. If you cannot answer one, you are not ready to buy it yet.

- Which of my five problems does this solve — and did a test confirm I have it?
- Is it certified to the right standard (53 or 58 for health; 42 for taste; 55 for UV), for the specific contaminant?

- What is the replacement filter price, and how many months does one last on water like mine?
- What is the five-year cost per litre, from the calculator?
- Can I install and maintain it myself, or is there a fitting cost?
- Are replacement filters generic or proprietary?

Installation and maintenance basics

Pitchers and faucet units need no tools. Under-sink and RO systems need a shut-off, a drilled tap hole for a dedicated faucet, and an hour of care; many people fit them themselves, but a nervous plumbing novice should budget for a fitter. Whatever you buy, put the next filter-change date in your calendar the day you install it — a filter left in past its life is worse than none, because it stops working and can harbour bacteria while you believe you are protected.

7. Common mistakes and sales tactics to ignore

- Buying for fear, not evidence. Test first; treat the contaminant you have, not the scariest one in the advert.
- Trusting a percentage with no standard behind it. "Removes 99%" is meaningless without naming the substance and the certification.
- Comparing on sticker price. Always convert to five-year cost per litre before you decide.
- Over-filtering. Reverse osmosis for a chlorine-taste problem wastes water and money.
- Forgetting the calendar. The best system fails if the filter is never changed.
- Chasing minerals claims. Remineralisation is a nicety, not a health necessity for most people on a balanced diet.

Quick reference

Decision snapshot

If your priority is…	Look first at…	Certification to check
Better taste, low effort	Pitcher / faucet carbon	NSF/ANSI 42
Health contaminant at one tap	Under-sink carbon or RO	NSF/ANSI 53 / 58
Widest dissolved-contaminant removal	Reverse osmosis	NSF/ANSI 58
Whole-home protection	Point-of-entry system	42 / 53 as applicable
Microbes on a well	UV + filtration	NSF/ANSI 55

The one calculation to remember

Cost per litre = (upfront + installation + yearly running cost × years) ÷ (litres per day × 365 × years). Compare every system on this number, never on sticker price alone.

This guide is independent and brand-neutral. It earns nothing from any product you choose. Use your own local prices and a certified test where health is involved.

Do Your Own Math — honest numbers before you buy.
doyourownmath.com/water/