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What's Coming From Your Tap?

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America's latest drinking problem isn't about alcohol.

Concerned about the cost of bottled water -- and its environmental consequences -- many people are turning back to tap water to quench their thirst. But as evidence mounts of contaminants in public systems, unease about the water supply is growing.

Engineers say that U.S. water quality is among the world's best and is regulated by some of the most stringent standards. But as detection technology improves, utilities are finding more contaminants in water systems. Earlier this year, media reports of trace amounts of pharmaceuticals in water across the country drew attention from U.S. senators and environmental groups, who are now pushing for regulation of these substances in water systems.



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Of particular concern, experts say, are endocrine-disrupting compounds -- found in birth-control pills, mood-stabilizers and other drugs -- which are linked to birth defects in wildlife. Also alarming are antibiotics, which if present in water systems, even in small amounts, could contribute to the rise of drug-resistant strains of bacteria, or so-called super bugs.

Many pharmaceuticals taken by humans are excreted into urine, or are flushed intentionally down the toilet. Even though wastewater is treated, trace amounts of the drugs are often not eliminated. Also, drugs found in the waste of animals treated with hormones and antibiotics can eventually end up in groundwater.

The actual health effects of drugs in water systems are unclear. The levels that have been detected are relatively small compared with those of other regulated contaminants, such as mercury and benzene. A 2008 study funded by the Denver-based Awwa Research Foundation -- a nonprofit research group that was established by the American Water Works Association -- concluded that it is "highly unlikely" that pharmaceuticals will pose a threat to human health.

But many medical experts argue that more studies need to be done -- and note that the amount of drugs in the water matters less than who drinks it. Some drugs, even in small amounts, can be especially harmful to infants, pregnant women or those with chronic health conditions, for example.

The publicity has frightened many consumers. Laura Pfeil, 39, a stay-at-home mother with four sons in Mason, Ohio, says it does concern her, "especially when thinking of my children's welfare."

She says she started using bottled water at home 15 years ago when she was pregnant with her eldest son because she thought it was safer than tap water. Three years ago, though, her family switched to a PUR Water Filter System, made by **Procter & Gamble Co.**, to save money and to reduce the waste resulting from plastic bottles. (Environmentalists also point to the energy wasted in transporting bottled water.)

Now, says Ms. Pfeil, she has concerns about consuming trace amounts of pharmaceuticals that the filter may not eliminate. A spokeswoman for P&G's PUR division says it "cannot confirm the reduction of pharmaceuticals in water with carbon filters."

Sales of PUR filters are at an all-time high, says the spokeswoman, an indication of tap water's new popularity. U.S. consumers spent \$16.8 billion on bottled water in 2007, up 12% from the year before, according to Beverage Digest,

a trade publication. But growth has slowed over the last three years.

Drugs are only one category of contaminants found in tap water. A 2005 study released by the nonprofit Environmental Working Group, a Washington-based research group, found that tap water in 42 states is contaminated with more than 140 unregulated chemicals, including MTBE, perchlorate and industrial solvents.

Protesting a Disinfectant

Even chemicals used to clean and disinfect drinking water are causing worry. Citizens' groups in states such as California, New York and Vermont are protesting the increasing use of chloramine -- a combination of chlorine and ammonia -- to disinfect drinking water. Utilities are using chloramine because of Environmental Protection Agency limits on chlorine byproducts.

Citizens Concerned About Chloramine in the San Francisco Bay Area, an activist group, says that hundreds of residents have had reactions, such as rashes and respiratory problems, to the disinfectant. Some byproducts of chloramine can be more toxic than chlorine byproducts, says Michael Plewa, a professor of genetics at the University of Illinois at Urbana-Champaign who has studied disinfection byproducts.

The EPA says chloramine is safe in drinking water and has been used for decades.

In the absence of federal regulation of certain chemicals in water systems, some states have stepped in. California, for one, has set standards for various compounds that are not regulated by the EPA, including perchlorate, an ingredient used in rocket fuel that was spilled into groundwater during the Cold War and has been found in many water systems. Massachusetts has set standards for perchlorate and requires that water utilities in the state test for MTBE, a gasoline additive.

"What you see in many states is a reaction to the lack of action at the federal level," says Suzanne Condon, director of the Bureau of Environmental Health at the Massachusetts Department of Public Health.

Tap Versus Bottled

Health concerns extend to bottled water, says Sarah Janssen, a science fellow at the Natural Resources Defense Council, or NRDC, a nonprofit environmental advocacy group based in New York. "A lot of bottled water is actually tap water, so there is no assurance that what is coming from the bottle is any safer than what is coming from the tap," she says.

In fact, experts say tap water is held to more stringent standards by the EPA, and tested more often, than bottled water, which is regulated by the Food and Drug Administration.

Utilities are required by law to send annual reports to their customers detailing contaminants found in water systems and whether they exceed levels set by the EPA. They are not required to list unregulated contaminants in these reports.

If a contaminant exceeds the EPA's "maximum contaminant level," the report should detail the potential health effects of the contaminant and a summary of actions the utility is taking. If you do notice a contaminant that exceeds EPA levels in your utility's report, consider installing a tap-water filter, experts say.

Water that is tested by utilities is generally tested at the plant. It still has to travel through your pipes to get to your tap, so if you have pipes that are a couple of decades old, it may be a good idea to get the water from your tap tested in a lab -- especially if you are pregnant, nursing or have small children, says the NRDC's Dr. Janssen. People who get their water from private wells should have their water tested annually.

Water filters aren't foolproof. Those that are certified by NSF International -- a nonprofit group that tests food and water products -- can get rid of unwanted chemicals to EPA's standards, but consumers should be aware that trace amounts of chemicals may still be left in their water.

Carbon filters, which come in the form of a faucet mount or a pitcher, are the most commonly used and cost about \$30, says Rick Andrew, operations manager of the drinking water treatment unit program at NSF. These can be fairly effective in removing many contaminants, but need to be replaced about every two months.

Other options -- such as reverse-osmosis systems, which use a semipermeable membrane to remove contaminants, or ultraviolet light treatment, which prevents micro-organisms from reproducing -- can be more effective, but they cost hundreds or even thousands of dollars. Some consumers have found the cost is worth it, especially if members of the family have certain health conditions.

Last April, Elizabeth Beyer, 47, purchased a Kinetico Inc. K5 Drinking Water Station for her father, who had a liver transplant in February. Doctors had advised him to drink only filtered water. The system, which cost \$2,100, is meant to remove contaminants ranging from lead to chlorine sediment using reverse-osmosis technology and two additional filters.

Ms. Beyer, who lives in Venice, Fla., says it was worth it. Her water is clearer and crisper. "I can definitely taste the difference," she says. "You can see the difference."

Choosing a Filter System

Here's how some different types of home water filters work.

Filter	How it works	Where it's used	What it filters
Activated carbon filter	Positively charged and highly absorbent carbon in the filter attracts and traps many impurities.	Countertop, faucet filters and under-the-sink units.	Bad tastes and odors. Standard 53-certified filters also can substantially reduce many hazardous contaminants, including heavy metals, disinfection byproducts, parasites, pesticides, radon and volatile organic chemicals.
Cation-exchange softener	"Softens" hard water by trading minerals with a strong positive charge for those with less of a charge.	Whole-house point-of-entry units.	Calcium and magnesium, which form mineral deposits in plumbing and fixtures, as well as barium and some other ions that can create health hazards.
Distiller	Boils water and recondenses the purified steam.	Countertop or whole-house point-of-entry units; can be combined with a carbon filter.	Heavy metals such as cadmium, chromium, copper, lead and mercury, as well as arsenic, barium, fluoride, selenium and sodium.
Reverse osmosis	A semipermeable membrane separates impurities from water.	Under-the-sink units; often in combination with a carbon filter or UV disinfection unit.	Most contaminants, including certain parasites, heavy metals and other pollutants.
Ultraviolet disinfection	Ultraviolet light kills bacteria and other micro-organisms.	Under-the-sink units, often in combination with a carbon filter and sediment screen.	Bacteria and parasites. Class-A systems protect against harmful bacteria and viruses, while class-B systems are designed to make non-disease-causing bacteria inactive.

Source: The Natural Resources Defense Council

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