

Is Rainwater Safe to Drink?

By Chris Wiant, MPH, PhD

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In a nutshell...

Many Americans collect, store, and use (harvest) rainwater for watering plants, cleaning, bathing, and sometimes drinking. This article addresses some of the many household uses of harvested rainwater, including how to consume collected rainwater safely.

Freshwater scarcity is a global concern, including in growing areas of the United States. Collecting, storing, and using rainwater—called rainwater harvesting—can be an effective form of local [water conservation](#) and [water reuse](#). Rainwater has been used for nearly any purpose that requires water, including landscaping, wildlife and livestock watering, and fire protection. Domestic rainwater harvesting, like “[gray water reuse](#),” can also reduce demand on existing potable water supplies and stormwater runoff.

Most people get their drinking water from a tap, well, or bottle. But perhaps you’ve wondered whether rainwater is safe to drink. Although drinking clean rainwater can be a perfectly healthy way to hydrate, it’s not more beneficial for your health than drinking water from other clean sources. And while clean rainwater can be safe to drink, it can become contaminated as it journeys from the atmosphere to your lips, which can pose a significant health hazard. It also lacks dissolved minerals like calcium, magnesium, and potassium that can be beneficial to your health.

Rainwater Harvesting Basics

Rainwater harvesting usually involves collecting rainwater from the roof of a house via gutters that channel the run-off water into some kind of storage container (e.g., rain barrel, covered cistern) for later use. Some states and local governments have no regulations pertaining to rainwater harvesting, other states support and encourage its use, while others, including my home state of Colorado, [have restrictions or limitations](#) on the practice. For example, Colorado law limits residents to collecting rainwater from a catchment system on their rooftops into rain barrels with a combined capacity of 110 gallons. Also, the collected rain must be



1" of rain × 1 sq. foot = 0.62 gallons of freshwater

used on the same property where it is collected and may only be used for outdoor purposes such as lawn irrigation and gardening.

Rainwater collection systems can [vary widely](#) in size, cost, and complexity—from simple rain barrels to extensively piped “wet” systems with underground storage and that are built according to [NSF standards](#). But all rainwater harvesting systems share the same basic components: a catchment area or surface (usually the roof), conveyance system, storage, treatment, and distribution to taps. These components are illustrated and described on the Texas A&M Extension Service’s [Rainwater Harvesting website](#).

International Rainwater Harvesting

Rainwater harvesting continues to grow in use [around the world](#) where water scarcity is a daily fact of life that is only predicted to worsen in coming decades as populations increase and concentrate in arid regions. This growth has moved rainwater harvesting from farm cisterns to increasingly widespread and sophisticated collection systems for households and businesses. This expansion is not only occurring in developing countries where rainwater is becoming a major source of drinking water for millions, but also in more developed nations such as Germany, Singapore, Australia, and Japan.

How Safe Is Rainwater?

Rainwater is not as pure as you might expect. Despite sometimes aggressive marketing claims, drinking rainwater [has not been shown](#) to be more beneficial than other sources of clean drinking water. It is prudent to never assume that rainwater is safe to drink. Rain can wash different types of contaminants into the water you collect. For example, dirt and bird poop from the roof can end up in your water barrel or storage tank. Rainwater can carry bacteria, parasites, viruses, and chemicals that might make you sick, especially when rain follows several days of dry weather. [Contaminated rainwater](#) has been linked to waterborne disease outbreaks.

The risk of getting sick from rainwater will vary depending on your location, how frequently it rains, time of year (e.g., fallen leaves), and perhaps most importantly—how you collect and store rainwater. For example, dust, smoke, and soot from the air can be dissolved in rainwater before it even lands on your roof. Also, roofing materials, gutters, piping, and storage container materials can introduce potentially harmful metals like copper and lead as well as other chemicals to the water, though U.S. building standards minimize some of these risks. To eliminate heavy metals or certain chemicals, you may need to use, and properly maintain, a water filtration system.

Drinking Rainwater Safely

Persons who collect and store rainwater for drinking water or other domestic uses are responsible for ensuring that their water is safe to drink. In addition to proper installation and maintenance of a rainwater harvesting system, the U.S. Centers for Disease Control and Prevention ([CDC recommends](#) that rainwater “intended for drinking needs to be filtered, disinfected, and tested regularly.” We previously wrote about the importance of cleaning and disinfecting dedicated water storage tanks (i.e., those filled from a municipal water supply or groundwater) at least twice a year with [liquid chlorine bleach](#). This is necessary to remove and prevent microbial contamination that can cause illness. Cisterns, rain barrels, and other containers intended for storing rainwater should also be properly maintained and appropriately disinfected, and per CDC—especially [after flooding and heavy rains](#). Rainwater storage containers should be opaque to prevent algae growth as well as screened or periodically drained to prevent mosquitoes from breeding,

which can lead to disease. Of course, persons with a weakened immune system should always be careful with their drinking water source.

Other Household Uses of Rainwater

Even in U.S. communities where residents are supplied with treated public water for drinking, homeowners and businesses are increasingly turning to rainwater harvesting systems to address non-potable water needs, such as landscape watering, especially in dry regions. When rainwater is used as a supplemental household water source, homeowners and businesses should ensure that rainwater cannot enter pipes (i.e., no cross-connections) containing safe drinking water, such as from the local community water system or piping from a dedicated drinking water well. In such cases, to lower the risk of getting sick, if possible, avoid using rainwater for drinking, cooking, brushing your teeth, or rinsing or watering plants that are intended to be eaten.

Closing Thoughts

Rainwater, if appropriately harvested, can provide an alternative and potentially sustainable source of freshwater for a wide variety of domestic uses. It can also be used as drinking water if strict safety measures are in place and carefully maintained. On that note, filtering, boiling, or disinfecting (or a combination) rainwater can make rainwater safe for human consumption. But it's important to have reliable collection, treatment, and testing in place *before* you drink it. If you have any doubts in your ability to ensure the above, we recommend limiting your use of collected rainwater to things like gardening, washing clothes, or bathing (and try to keep it out of your eyes, nose, and mouth). Most Americans, myself included, are content to rely on and trust in the safety, reliability, and cost-effectiveness of drinking water provided by our local community water system.

Chris Wiant, MPH, PhD, is the former president and CEO of the Caring for Colorado Foundation. He is also chair of the Water Quality & Health Council and a former member of the National Drinking Water Advisory Council.

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