

Copper in Drinking Water

Copper is a metal that is found naturally in rock formations. Your body needs some copper to stay healthy, but too much is harmful. It is used to make many products, including parts for plumbing systems. Copper can get into your drinking water as the water passes through your household plumbing system if it contains copper piping or parts. Copper is rarely found at high levels in groundwater in Minnesota.

Health Effects

Eating or drinking copper does not usually cause illness in most healthy people. Most people's bodies process copper effectively.

However, it is possible that eating or drinking too much copper can cause headaches, vomiting, diarrhea, stomach cramps, nausea, liver damage, and kidney disease. High levels of copper may damage red blood cells and may also reduce the ability of red blood cells to carry oxygen. Male fertility may be affected by high levels of copper. People with Wilson's disease and some infants (babies under one year old) are more sensitive to copper. Their bodies are not able to get rid of extra copper easily.

Healthy people usually do not have illness associated with eating or drinking copper because their bodies are able to maintain an appropriate level of copper through normal functioning of body systems. For more information, visit [Copper | The Nutrition Source | Harvard T.H. Chan School of Public Health](https://www.hsph.harvard.edu/nutritionsource/copper/) (<https://www.hsph.harvard.edu/nutritionsource/copper/>).

From Environmental Protection Agency

Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively

short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

How to Protect Yourself and Your Family

Drinking water with more than 1,300 micrograms of copper per liter of water ($\mu\text{g/L}$) * can be a health risk for everyone. Infants and people with Wilson's disease may need water with an even lower level of copper to stay safe.

Copper can get into your drinking water as it passes through your plumbing system. Over time, plumbing parts with copper in them usually build up a natural coating that prevents copper from being dissolved into the water. Plumbing systems with copper parts less than three years old usually have not had time to build up this protective coating.

Knowing about your home's plumbing system can help you understand your potential exposure to copper from your drinking water. If you cannot determine what type of material your home is plumbed with, consult a plumber, building inspector, or other qualified person.

You can take the steps below to help keep your drinking water safe:

1. **Let the water run** for at least 30-60 seconds before using it for drinking or cooking if the water has not been turned on in over six hours.
2. **Use cold water** for drinking, making food, and making baby formula. Hot water releases more copper from pipes than cold water.
3. **Test your water.** In most cases, letting the water run and using cold water for drinking and cooking should keep copper levels low in your drinking water. If you are still concerned about copper, arrange with a certified laboratory to test your tap water. Testing your water for copper is important if an infant or someone with Wilson's disease drinks your tap water. Minnesota Department of Health (MDH) recommends using an accredited laboratory. See [Search for Accredited Laboratories \(https://eldo.web.health.state.mn.us/public/accreditedlabs/labsearch.seam\)](https://eldo.web.health.state.mn.us/public/accreditedlabs/labsearch.seam). Contact the laboratory to get sample containers and instructions or ask your county environmental or public health services if they provide water testing services.
4. If tests show you have levels of copper over 1,300 µg/L in your drinking water after you let the water run 30-60 seconds, you may want to consider home water treatment. See [Home Water Treatment \(https://www.health.state.mn.us/communities/environment/water/factsheet/hometreatment.html\)](https://www.health.state.mn.us/communities/environment/water/factsheet/hometreatment.html).

* 1 microgram per liter (µg/L) = 1 part per billion (ppb)

If you own a private well

Copper is not usually found in the groundwater that feeds your well. Copper may enter your drinking water as it travels through your plumbing system. If your plumbing system has parts made with copper, follow the steps above to help keep your drinking water safe.

If you have a new well connected to your drinking water system, the new well may have different water characteristics than your old well. Be aware that the water from the new well may dissolve copper from your plumbing.

If you are on a public water system

The U.S. Environmental Protection Agency (EPA) has an action level of 1,300 µg/L for public water systems serving places where people live, work, go to school, and receive childcare. These systems have to take actions to reduce the amount of copper in the water if more than 10 percent of the water samples they take from homes and sampling sites served by the system have copper levels over 1,300 µg/L.

You can find the level of copper detected in a community water system (systems serving where you live) by reading the system's Water Quality Report (also known as a Consumer Confidence Report (CCR)). You can call your community water system to get a copy of your CCR, or you may be able to find it online at [Find Your Local CCR \(https://www.health.state.mn.us/communities/environment/water/com/ccr.html\)](https://www.health.state.mn.us/communities/environment/water/com/ccr.html). Remember that your home may have higher levels of copper in drinking water than the homes your public water system

tested. Follow the steps above to help keep your drinking water safe.

Noncommunity water systems serving schools, offices, factories, and childcare facilities test for copper; you can contact your noncommunity system to find the level of copper detected in the system.

Noncommunity systems serving restaurants, resorts, and campgrounds are not required to test for copper.

Background Information

Very few homes constructed in the last 20 years are plumbed with copper due to the cost. Most newer homes are plumbed with plastic piping (like PEX or PVC) but may still use copper fittings or components.

Older homes are more likely to have copper piping and copper can get into drinking water if the water moving through the plumbing system is corrosive. Corrosive water can dissolve copper in plumbing parts. Pinhole leaks, pitting in your pipes, or blue green stains on plumbing fixtures may be signs that you have corrosive water. If you see signs of corrosive water, [Lead in Drinking Water](https://www.health.state.mn.us/communities/environment/water/contaminants/lead.html) (<https://www.health.state.mn.us/communities/environment/water/contaminants/lead.html>) may also be problem. Water with a lot of dissolved copper in it can make drinking water taste or smell bad or give it a blue color.

Copper in Minnesota Water

Some groundwater in Minnesota can be corrosive enough to dissolve copper. Although the pH of groundwater in Minnesota is normally high enough to prevent water from dissolving copper, there

are other water qualities that may contribute to corrosion.

Public water systems monitor how corrosive water is to reduce the risk of lead and copper getting into drinking water. Learn more about copper and lead levels in Minnesota public water systems at [Drinking Water Protection Annual Reports](https://www.health.state.mn.us/communities/environment/water/dwar.html) (<https://www.health.state.mn.us/communities/environment/water/dwar.html>).

In 1999, the Minnesota Pollution Control Agency found that none of the 954 wells they tested in Minnesota had copper levels over the EPA action level.

What MDH is Doing

MDH regulates public water systems by:

- Approving public water systems' treatment plans
- Enforcing the [Safe Drinking Water Act](https://www.epa.gov/sdwa/title-xiv-public-health-service-act-safety-public-water-systems-safe-drinking-water-act-0) (<https://www.epa.gov/sdwa/title-xiv-public-health-service-act-safety-public-water-systems-safe-drinking-water-act-0>), which has a specific part addressing lead and copper
- Testing public water systems

MDH also studies the presence and risk of chemicals, such as [Copper Sulfate and Chromated Copper Arsenate](https://www.health.state.mn.us/communities/environment/risk/docs/guidance/dwec/screening/coppersulfate.pdf) (<https://www.health.state.mn.us/communities/environment/risk/docs/guidance/dwec/screening/coppersulfate.pdf>), that break down into copper and can enter water.

What Other Groups are Doing?

The Agency for Toxic Substances and Disease Registry provides a [Toxicological Profile for Copper](#)

<http://www.atsdr.cdc.gov/toxprofiles/TP.asp?id=206&tid=37>).

A new U.S. Geological Survey [Study Shows High Potential for Groundwater to be Corrosive in Half of U.S. States](https://www.usgs.gov/news/new-study-shows-high-potential-groundwater-be-corrosive-half-us-states-0) (<https://www.usgs.gov/news/new-study-shows-high-potential-groundwater-be-corrosive-half-us-states-0>).

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