

wellcare[®] information for you about pH in Drinking Water

What is pH in drinking water?

The pH level of your drinking water reflects how acidic it is. pH stands for “potential of hydrogen,” referring to the amount of hydrogen found in a substance (in this case, water). pH is measured on a scale that runs from 0 to 14. Seven is neutral, meaning there is a balance between acid and alkalinity. A measurement below 7 means acid is present and a measurement above 7 is basic (or alkaline).

What are the health effects of pH?

The U.S. Environmental Protection Agency (EPA) does not regulate the pH level in drinking water. It is classified as a secondary drinking water contaminant whose impact is considered aesthetic. However, the EPA recommends that public water systems maintain pH levels of between 6.5 and 8.5, a good guide for individual well owners.

Water with a low pH can be acidic, naturally soft and corrosive. Acidic water can leach metals from pipes and fixtures, such as copper, lead and zinc. It can also damage metal pipes and cause aesthetic problems, such as a metallic or sour taste, laundry staining or blue-green stains in sinks and drains. Water with a low pH may contain metals in addition to the before-mentioned copper, lead and zinc.

Drinking water with a pH level above 8.5 indicates that a high level of alkalinity minerals are present. High alkalinity does not pose a health risk, but can cause aesthetic problems, such as an alkali taste to the water that makes coffee taste bitter; scale build-up in plumbing; and lowered efficiency of electric water heaters.

How do I test for pH?

Contact your state or local health department for a list of certified laboratories that can test the pH level of your water. If your water is acidic (less than 7 pH) you may have problems with leaching of copper and lead from your plumbing. Consider testing for copper and lead if the pH test shows your water is highly acidic. If testing indicates that your water has a high pH, consider testing for alkalinity and hardness as well, as these can be associated with high pH water.

What are the treatments for pH in drinking water?

Two home treatment methods to adjust pH are acid neutralizing filters and chemical feed pump systems injecting a neutralizing solution. An acid neutralizing filter uses a calcite or ground limestone (calcium carbonate) for normal pH correction, but could also include a blend of magnesium oxide and calcite, if the pH is very low. Since the water absorbs these minerals when it passes through the filter, the alkalinity and hardness will increase.

Hardness is easily treated with a water softener that uses an ion exchange process to remove the hardness minerals. A chemical feed pump solution is made with well water and soda ash (similar to baking soda) and mixed in a solution tank. The chemical feed pump injects this high pH solution into the household piping system where it reacts with the low pH water in a retention tank (typically 40 gallons) and neutralizes the pH. *Note: Neutralizing with soda ash slightly increases the sodium content of the water, which may pose additional health concerns, if someone in your household is on a reduced sodium diet. See the WSC wellcare[®] information sheet on “Sodium &*

Groundwater” for more information. Pot ash may also be used, with no impact on the sodium content of the water.

When selecting the pH treatment method, the levels of total dissolved solids (TDS) and carbon dioxide in the water should also be taken into consideration. For example, acid neutralizing filters are not as effective in raising pH when the water contains excessive levels of TDS or carbon dioxide.

If the pH level of the well water is greater than 8.5, you can reduce the effects of excessive alkalinity by installing either a special ion exchange unit designed to reduce alkalinity or a chemical feed pump system that injects a weak acid solution. This procedure is more complicated and beyond the scope of this information sheet. If high pH is a problem, please contact a local water specialist for detailed advice.

For more information about pH in drinking water

U.S. Environmental Protection Agency (EPA). Secondary Drinking Water Standards. Retrieved May 18, 2007 from www.epa.gov/safewater/consumer/2ndstandards.html

Wilkes University, Center for Environmental Quality, Environmental Engineering and Earth Sciences. pH of Water. Retrieved May 18, 2007 from www.water-research.net/ph.htm

For more information on your drinking water

Contact your local water well professional or health department for information on ground water in your area. The following websites provide up-to-date information on efforts to protect drinking water supplies and steps you can take as a private well owner. In addition, you may contact the wellcare® hotline at 1-888-395-1033.

Underwriters Laboratories Inc. Drink Well™ Well Water Testing
U.S. Environmental Protection Agency
Water Quality Association

www.uldrinkwell.com
www.epa.gov
www.wqa.org

For more information about wells and other wellcare® publications

wellcare® is a program of the Water Systems Council (WSC). WSC is a national nonprofit organization dedicated to promoting the wider use of wells as modern and affordable safe drinking water systems and to protecting ground water resources nationwide. This publication is one in a series of wellcare® information sheets. There were more than 60 available at the time this document was published. They can be downloaded FREE from the WSC website at www.watersystemscouncil.org. Well owners and others with questions about wells or ground water can also contact the wellcare® hotline at 1-888-395-1033 or visit www.wellcarehotline.org.



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