

wellcare[®] information for you about Well Water & Fluoride

What is Fluoride?

Fluoride is a natural substance that comes from the element fluorine, which is found naturally in rocks and soil. As water passes through the earth, it absorbs fluoride. As a result, most water contains some amount of fluoride.

Fluoride content varies by region. Dry regions generally have higher fluoride levels in their water than regions that have higher average rainfall amounts. Groundwater typically contains more fluoride than surface water.

Does well water contain Fluoride?

Fluoride occurs naturally in most groundwater, at levels ranging from 0.1 to more than 12 parts per million (ppm). The fluoride level in your water will depend on the nature of the rock near your well and the presence of fluoride-bearing minerals.

What are the health effects of excess Fluoride?

At low concentrations, fluoride is believed to prevent tooth decay and strengthen teeth. According to the American Dental Association (ADA), the optimal level of fluoride in water is between 0.7 and 1.2 ppm.

However, excessive amounts of fluoride consumed over time can accumulate in the bones and lead to skeletal fluorosis. Skeletal fluorosis involves pain or stiffness of the joints. In severe cases, it can cause damage to bone structure, calcification of ligaments, and crippling effects. The U.S. Environmental Protection Agency (EPA) has set an enforceable drinking water standard for fluoride of 4 mg/L, as it believes this is the maximum safe level to prevent individuals from acquiring skeletal fluorosis.

Even at lower levels, dental fluorosis (discoloration or weakening of teeth) may occur. Therefore, the EPA has also set a secondary standard of 2 mg/L for fluoride to protect against dental fluorosis. A secondary standard is one which the EPA recommends for public water systems to follow, but does not enforce. Dental fluorosis only affects the teeth before they erupt from the gums, so the EPA suggests that children under age 9 not drink water containing more than 2 milligrams per liter (mg/L) of fluoride.

How do I test for Fluoride?

You should have your well water tested to determine how much fluoride is in your drinking water. Contact your state or local health department for a list of state-certified laboratories in your area.

Knowing the fluoride levels of your well water will aid your child's dentist or physician in determining the best course of care for your child's dental health. For example, if fluoride levels in your water are below 0.6 ppm, your child's dentist or pediatrician may advise daily fluoride supplements, depending on your child's risk of developing tooth decay and their exposure to other sources of fluoride such as in toothpaste or from the drinking water at their school or daycare.

What are the treatments for excess Fluoride in drinking water?

If the natural fluoride level of your well exceeds 2 ppm, and you have children under age 9, you may choose to reduce or remove fluoride from your drinking water. Treatment options include

reverse osmosis, activated alumina and distillation. The use of bone charcoal, electrodialysis and deionization have also been shown to be effective.

It should be noted that the effectiveness of the above-mentioned treatment methods is somewhat dependent on the pH level of the water. For example, activated alumina is most effective at removing fluoride when the pH range is between 5.5 and 6.5. Boiling water will not remove fluoride, and will actually concentrate the amount of fluoride in the water.

For more information about Fluoride

American Dental Association/Centers for Disease Control and Prevention Brochure. (2006). Nature's Way to Prevent Tooth Decay: Water Fluoridation. Retrieved on May 10, 2007 from www.cdc.gov/fluoridation/pdf/natures_way.pdf

Centers for Disease Control and Prevention. Water Fluoridation. Retrieved on May 15, 2007 from www.cdc.gov/fluoridation/engineering/faqs.htm

Fawell J, Bailey K, Chilton J, Dahi E, Fewtrell L and Magara Y. World Health Organization. (2006). Fluoride in Drinking Water. Retrieved May 15, 2007 from http://www.who.int/water_sanitation_health/publications/fluoride_drinking_water_full.pdf

Water Quality Association. (March 2005). Technical Application Bulletin: Fluoride. Retrieved on May 16, 2007 from www.wqa.org/pdf/TechBulletins/TB-Fluoride.pdf

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 60 available at the time this document was published. They can be downloaded 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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Well water naturally better... Contact your local water well professional