

In This Issue

Horticulture 2
 Environmental Focus . . . 3
 Farm Views 4
 Urban Agriculture 5
 Food & Fitness 6
 Home & Family Living . . . 7
 4-H & Youth 8–9
 Community Focus 10
 Miscellaneous 11–12

Special Pullout Section: LANCASTER COUNTY FAIR SCHEDULE & MAP



Regularly Test Private Well Drinking Water for Safety

By Don Janssen
UNL Extension Educator

There are many reasons to have your well water tested regularly — most important is your health.

Water that comes from a private well is often high quality. Because your water supply is private, not municipal, it means that you alone are responsible to ensure that it's safe to drink.

There is no single test to determine the safety of drinking water. As with public drinking water, many contaminants can present a health risk if present in sufficient concentrations. These include biological contaminants such as bacteria or viruses; inorganic chemicals such as lead, nitrate or sulfate; and organic chemicals such as insecticides, herbicides, fuel and solvents. Other contaminants, while not a health risk, can make water less desirable for domestic use. These are referred to as nuisance contaminants and include calcium, magnesium, iron, manganese and hydrogen sulfide. It would be costly, and in most cases unnecessary, to test private water supplies for the nearly 100 contaminants for which public water supplies are required to test.

Hard water is the most common problem associated with ground water. Hard water can occur when ground water comes in contact with certain rocks and minerals, like gypsum, limestone, calcium or magnesium that can be released into the water. Generally associated with an abundance of calcium and/or magnesium dissolved in the water, hard water hasn't been linked to health problems, but it can become an annoyance, causing soap curds and deposits to form on pipes and other plumbing fixtures. Over time it can reduce the diameter of the pipes.



Iron can cause a rusty or metallic taste to your water. Iron can also collect in the pipes and as a result stains clothing. Since iron is naturally occurring, most ground water has some amount of dissolved iron in it. There are several ways to treat iron problems, including installing a water softener, aeration, chlorination, and feeding ozone or hydrogen peroxide (which is removed by filtration).

Generally, private water supplies should be tested annually for nitrate and bacterial contamination. These tests should be considered after flooding or when any noticeable change in taste, color or smell is detected. These changes may also indicate the need for other

tests. Testing for bacterial contamination should occur any time users of the water supply experience recurring bouts of intestinal illness or when an infant, person with a compromised immune system or elderly person becomes a water user. In addition, testing for bacterial contamination should occur when repairs or alterations are made to the well or water system, when activating a well or water system that has not been used for an extended period of time and following shock chlorination. Testing for nitrate should occur any time a pregnant woman, woman anticipating pregnancy or infant under 6 months old becomes a water user.

Coliform bacteria is most likely to be found during periods of wet weather when the soil is warm. Runoff and excess soil moisture carry contaminants into shallow groundwater sources or through well defects. To assess the year-round safety of drinking water, test for bacteria in the late spring or early summer during wet weather.

The best location to collect a water sample is at the tap used most frequently for drinking and cooking. If contaminants are found, inspect the water system for defects and, if necessary, collect additional samples at other locations to determine if the impurities are entering at the well or through defects in the plumbing system.

Take care when sampling for bacterial contaminants. Because bacteria are commonly carried on dust and dirt particles, avoid drawing a sample in extremely dirty locations where dust could accidentally enter the sterile sample container. Clean, indoor locations are best. If an outdoor sampling location must be used, avoid drawing samples from frost-proof hydrants. The buried valve allowing them to drain and avoid freezing can allow bacterially contaminated water to be drawn into the riser pipe leading to the hydrant. Follow directions carefully from the testing laboratory.

Nitrogen finds its way into ground



Photo by Rita Shelley

water usually just from the atmosphere, meaning that nitrogen unused by plants is released into the soil. Nitrogen compounds can also find their way into ground water through fertilizers and manure. Treating nitrogen and its many forms (ammonia, nitrate and nitrite) can be done through reverse osmosis systems with water softeners, but it is most important to identify the source of contamination and create a safe zone around your well head, making sure that it is free from any possible source of nitrogen.

Sulfur is the “rotten egg” smell that indicates the presence of hydrogen sulfide gas. Sulfur not only creates an unpleasant odor and taste, but also causes corrosion to plumbing and can darken water. It can be treated by aeration, ozone, hydrogen peroxide and chlorine followed by filtration.

Other typical additional tests are those for iron, manganese, water hardness, sulfides and other water constituents that cause problems with plumbing, staining, water appearance and odor. Changes in these constituents may indicate changes in your well or local ground water. Additional tests may be recommended if water appears cloudy or oily, if bacterial growth is visible on fixtures or water treatment devices are not working as they should. Check with your water well contractor or local health department for information on local water quality issues.

The National Ground Water Association recommends that owners of private water wells get their water tested annually for the presence of coliform bacteria, nitrates and anything else of local concern as part of an annual well maintenance checkup.

A concise, clear, written report should be delivered to you following the checkup that explains results and recommendations and includes all laboratory and other test results.

Your well should be disinfected with a chlorine solution any time work is done on the well or pump. Directions for shock chlorinating your well are available from your University of Nebraska–Lincoln Extension office.

FOR MORE INFORMATION

UNL Extension has numerous publications on drinking water quality available at the extension office or online at <http://www.ianrpubs.unl.edu/sendIt/water>

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Approved Water Testing Laboratories

The Nebraska Health and Human Services System Department of Regulation and Licensure approves (certifies) laboratories in Nebraska to test drinking water samples. As of January 2006, there are three government-operated and four commercial-operated approved laboratories. Only one is located in Lancaster County: Nebraska Health and Human Services Regulation and Licensure Laboratory, 3701 S. 14th St., Lincoln, NE 68502; 471-2122; <http://www.hhs.state.ne.us/lab> — contact for fees, sample containers and proper sampling procedures.

Source: UNL Extension NebGuide G1614
“Drinking Water: Approved Water Testing Laboratories in Nebraska”