

# Coliform Bacteria and Nitrate in Private Wells

## What's in your water?

Private well water is not monitored or regulated by local, state or federal agencies. It is the responsibility of homeowners with private wells to monitor water quality and maintain their well water system. Routine water tests are the best way to ensure the safety of the water.

Homeowners can protect their water supply by performing a routine maintenance check on the well water system and correcting (if possible) any structural defects that may allow contamination to enter the water supply.

## Total Coliform and *E. coli* Bacteria

**WHAT IS IT?** Total coliform bacteria are microorganisms that are commonly present in soil, sewage, surface water and very shallow groundwater. *E. coli* (*Escherichia coli*) bacteria are a subset of the total coliform group that are found in sewage.

**IS IT UNSAFE?** The presence of total coliform and/or *E. coli* bacteria in drinking water poses a **potential health hazard**. The presence of either bacteria indicates a possible sanitary defect in the well system, which could allow other harmful contaminants to enter the system.

Bacteria Test Results	Interpretation
Total Coliform absent, <i>E. coli</i> absent	Bacterially safe
Total Coliform <b>present</b> , <i>E. coli</i> absent	Bacterially <b>unsafe</b> , potential health hazard
Total Coliform <b>present</b> , <i>E. coli</i> <b>present</b>	Bacterially <b>unsafe</b> , serious health risk

The presence of *E. coli* bacteria in drinking water indicates that a pathway exists from a waste source such as animal feedlot runoff, septic tank or cesspool leakage, etc., to well water.

If total coliform and *E. coli* bacteria are present in drinking water, this indicates that the water may be contaminated with disease-producing microorganisms from a sewage source, such as *Salmonella* or enteric viruses. This represents a **serious health concern**.

**WHAT NEXT?** Disinfect water by boiling it for one minute or use an alternative source of water that is known to be safe, such as bottled water or water from a public water supply. Do not consume water or brush teeth with water that has total coliform or *E. coli* bacteria unless it is properly disinfected. Wash dishes and utensils with disinfected water or run the sanitation cycle on a dishwasher.

## Nitrate

**WHAT IS IT?** Nitrate is a naturally occurring compound found in the environment with high concentrations in animal waste, septic tanks and nitrogen-containing compounds such as fertilizers.

**IS IT UNSAFE?** High levels of nitrate in drinking water may pose a **serious health hazard** for infants. Infants who are fed formula or juice with elevated levels of nitrate could develop a life threatening illness called methemoglobinemia, or "blue baby syndrome," which results in blue-gray coloring of the skin due to a lack of oxygen in the blood.

New research studies suggest **potential health hazards** for adults following long-term consumption of elevated nitrate levels.



STATE HYGIENIC LABORATORY  
AT THE UNIVERSITY OF IOWA

Iowa's Environmental and Public Health Laboratory

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**WHAT NEXT?** Do not use water with elevated nitrate in infant formula or juice. Use an alternative source of water that is known to be safe, such as bottled water or water from a public water supply, or remove this contaminant using an appropriate treatment device.

## Sanitary Survey and Water Treatment

The best approach to ensuring safe water is to determine how and where contaminants are entering the system and eliminate the entry pathway.

A sanitary survey of your water system and remediation assistance may be available from your local county health department, Iowa State University extension services, and certified well drillers and pump installers. If you have a positive coliform test, flowcharts are available to guide you through the search for the entry pathway in SHL's Well Water Quality and Home Treatment Systems booklet. (See link below or contact SHL.)

If installation of a water treatment systems appears to be the only option, the treatment system(s) must match the specific contaminant(s) that must be removed. No system treats all water quality problems, and all systems have limitations and require maintenance. Before buying a treatment system, an accurate analysis of the water is recommended to determine what contaminants are present and at what concentration. After a home treatment device is installed, have your drinking water retested for that specific contaminant to ensure it is working properly. (Booklet: [shl.uiowa.edu/env/privatewell/homewater.pdf](http://shl.uiowa.edu/env/privatewell/homewater.pdf))

## Test Regularly

The State Hygienic Laboratory recommends that water from every private well be tested for total coliform bacteria, *E. coli* and nitrate at least once each year.

Additional tests may be needed depending on where you live and what is located near your drinking water supply. Contact the laboratory or visit the following web page for common concerns and the tests used to help identify the problem: [shl.uiowa.edu/env/privatewell](http://shl.uiowa.edu/env/privatewell).

Funds may be available to cover the costs of testing private well water. Contact your local county health department or the State Hygienic Laboratory for more details.

## Contact

Phone: 1-800-421-IOWA (4692)

Email: [shl-gtc@uiowa.edu](mailto:shl-gtc@uiowa.edu)

Online: <http://www.shl.uiowa.edu/>

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Contact your local county health department for details.

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