

Water Testing: What to Test For

Some people depend on their own well, pond, spring or cistern for drinking water. Individual water supplies of this sort are private. Water testing or water treatment is usually not required by law. The exceptions are bacteria tests for existing or new construction that is being evaluated for loans, including FHA, VA, FmHA and conventional. Dairy water supplies must be tested for bacteria and meet dairy industry standards.

Water testing and treatment can be expensive and time-consuming, but they are the only ways a homeowner can ensure a safe and reliable water supply. Individuals using public water supplies pay for water testing and treatment as a part of their water bill. Individuals operating a private water system do not have this benefit and are responsible for the testing and treatment of their water.

Choosing water tests

Testing water for every contaminant is possible but very expensive, impractical and not necessary. It is more important to test on a regular basis for a few indicators of contamination and to maintain a record of water quality. This helps to identify changes in the supply, contamination of the water source or deterioration of the water system. Good records of water quality are also important should you need to prove that your water has been contaminated by some outside activity such as mining or waste disposal.

Routine testing

Routine testing of water supplies covers these possible contaminants:

- Total coliform bacteria
- Nitrate
- pH (acid or alkaline level)
- Total dissolved solids

If requested, standard laboratory procedures will identify the amounts of specific bacteria, chemical compounds and other components that affect water quality. Routine annual water tests are most important, even if no obvious water problems exist.

Testing nuisance waters

Other tests identify particular problems and help in selecting water treatment equipment. Nuisance water may present no health hazard, but may not be satisfactory for all uses. Common complaints include staining of fixtures and fabrics, off-color appearance, unusual taste or odor, and deposits and pitting of metals. See Table 1 for a list of useful laboratory tests for nuisance water. MU Extension publications EQ101, *Understanding Your Water Test Report*, and EQ104, *Home Water Treatment Systems*, include other information about suggested testing and treatment.

Collecting water samples

Proper collection and handling of a water sample is important for a meaningful water test. **Sample containers should always be obtained from the testing laboratory or local health department**, because containers may be especially prepared for a specific contaminant. Sampling and handling procedures depend on the water quality concern and should be followed carefully. **Read all directions fully before attempting to collect your sample.** If the water is being treated, it may be necessary to sample both before and after the water goes through the treatment equipment.

Bacteria sampling

Water samples for bacteria tests must always be collected in a sterile container. Take the sample from an inside faucet with the aerator removed. Sterilize by flaming the end of the tap with a disposable butane lighter. Run the water for two minutes to clear water lines and bring in fresh water. Do not touch or contaminate the inside of the bottle or cap. Carefully open the sample container and hold the outside of the cap. Fill the container to the line to allow mixing and replace the top. Refrigerate the sample and transport it to the testing laboratory within 36 hours (preferably in an ice chest). Many labs, including the state Health Department, will not accept bacteria samples on Friday or before a holiday, so check to find out the lab's schedule.

Iron bacteria forms a very obvious slime on the inside of pipes and fixtures. A water test is not needed to identify it. Check for a reddish-brown slime inside a toilet tank or where water stands for several days.

Revised by
Bob Broz, Extension Water Quality State Specialist, Division of Food Systems and Bioengineering

Table 1. Laboratory tests for nuisance water

Symptom	Appearance	Test
Stained fixtures and clothes	red or brown	iron
	reddish-brown slime	iron bacteria
	black stain, greasy feel	manganese
	green or blue	copper
Off-color	cloudy	turbidity
	black	hydrogen sulfide, manganese
	brown or yellow	iron, tannic acid
Unusual taste and odor	rotten egg	hydrogen sulfide
	metallic	pH, corrosive index, iron, zinc, copper, lead
	salty	total dissolved solids, chloride
	septic, musty, earthy	total coliform bacteria, methane
	alkali	pH, total dissolved solids
	gasoline or oil	hydrocarbon scan
Corrosive water	soapy	surfactants
	deposits, pitting	corrosion index, pH, copper, lead

Chemical sampling

Sample bottles used to collect water for chemical analysis often contain a fixing compound to prevent loss or breakdown of specific chemicals. Always obtain these sample bottles and instructions from the testing laboratory. Run water at an inside tap for five minutes to clear the lines and bring in fresh water. Follow instructions for filling sample bottles and transport samples to the testing laboratory as quickly as possible, via personal delivery or overnight mail service.

Hydrogen sulfide sampling

Hydrogen sulfide is a gas with a distinctive odor like rotten eggs. The gas escapes from water very quickly, so if needed, measurements of hydrogen sulfide concentrations must be made immediately, on site. In most cases, this will not be necessary. If the odor is present, hydrogen sulfide is present.

Corrosion sampling

When sampling for evidence of corrosion, allow the water to stand in the water lines overnight or longer. **Do not let the water run before collecting a sample** because water held in the pipes will have corrosion products. Take the sample from an inside faucet with a laboratory container. Deliver the samples to the laboratory in person, or use an overnight mail service.

Organic chemical sampling

Many organic contaminants are volatile and will escape from solution when aerated. Take extra care when collecting these samples. Remove the faucet aerator and let water run for five minutes to clear the pipes and bring in fresh water. Partially close the faucet until a slow, steady, non-aerated stream of water flows. Hold the laboratory sample bottle at an angle to reduce aeration when filling. Fill the bottle completely and replace the cover. Invert the bottle and check for air bubbles. If bubbles are present, empty and take another sample. Take the sample to the laboratory in person if possible or use an overnight mail service.

Sampling for court cases

Sometimes water samples are taken for evidence in a court case to show pollution or damage to a water supply. These samples should always be collected by a health department sanitarian trained in proper sample collection methodology, who can testify as to how the sample was handled. Notify the sanitarian that this sample is being used in court and that the chain-of-custody must be adhered to. Use a state-approved lab for all water testing. Your record of routine sampling provides evidence about your water supply before pollution or damage.

Test results

The laboratory sends out water test results anywhere from a few days to a few weeks after receipt of samples. Water test results often list the drinking water standards to aid in interpreting the results. Contact your local extension specialist or your county health department for help interpreting test results and determining corrective action. **File your water test report in a safe place for future reference.**

This MU publication — previously named WQ100 *Water Testing: What to Test For* — was reviewed and adapted for Missouri by Wanda Eubank, Jerry D. Carpenter and Beverly A. Maltzberger, University of Missouri, and by Nix Anderson, Missouri Department of Health, from “Water Testing” by Karen Mancl, Water Quality Specialist, The Ohio State University.

ALSO FROM MU EXTENSION PUBLICATIONS

- EQ101 *Understanding Your Water Test Report*
- EQ102 *Bacteria in Drinking Water*
- EQ103 *Nitrate in Drinking Water*
- EQ104 *Understanding Home Water Treatment Systems*

extension.missouri.edu | 800-292-0969