



UGA EXTENSION

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HOME WATER QUALITY AND TREATMENT

The quality of your water supply can have both an immediate and a prolonged effect on the health of your household. Many Americans, especially those dependent upon well water, assume that their water is safe and healthy. Unfortunately, this is not always the case.

COMMON MISCONCEPTIONS

MYTH: I should be more concerned about my drinking water if it comes from the public water works than if it comes from a private well.

FACT: It is actually the other way around. According to the Safe Drinking Water Act, a public water supply is required to be regularly tested and treated (if necessary) to meet Environmental Protection Agency standards. To verify whether this is being done, you can contact the local water company and request a copy of the Water Quality Report/Consumer Confidence Report. Wells, especially if they are poorly constructed or old, can become contaminated and should be routinely tested (at least once a year). Always have your water tested if you suspect a problem. Once you have established the nature of the problem, an appropriate means of treatment can be determined.

MYTH: There is no cause for concern if my water tastes good and looks clear.

FACT: Many contaminants do not affect the taste or appearance of your water, but can affect your health.

MYTH: One simple test can check for all contaminants.

FACT: No single test can check for all contaminants. You should first test for the most common contaminants (e.g., nitrate, total coliform bacteria, etc.) to determine if your water system is vulnerable to contamination.

MYTH: One treatment system can address all potential water quality problems.

FACT: To date, no single treatment system can remove all contaminants such as bacteria, chemicals and minerals.

MYTH: Once installed, a treatment system will remain effective forever.

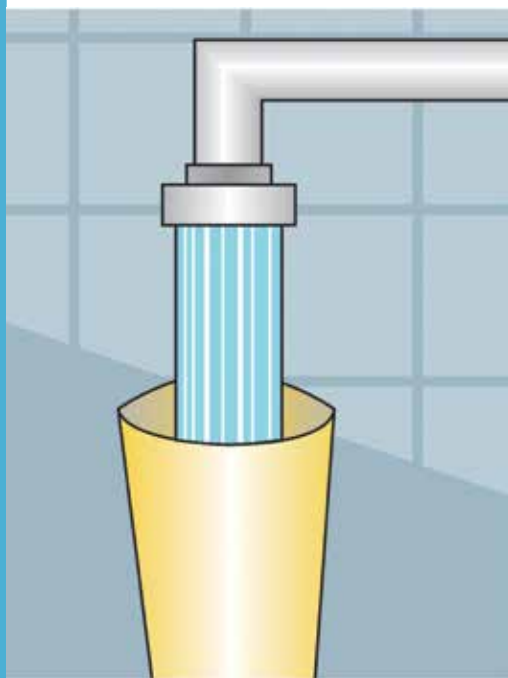
FACT: For continued effectiveness, it is essential to follow regular maintenance and testing of treated and untreated waters as recommended by the manufacturer or a water treatment professional. Levels of contamination may also change over time.

YOUR HOME WATER SUPPLY

Before buying a home water treatment system, determine why such a system is needed. Public water supplies in the United States are required by law to be tested for their safety. However, private water supplies (such as wells) should be regularly tested to ensure their safety. Testing by a certified laboratory provides unbiased information and will enable you to decide what treatment system is best for you.

THE QUEST FOR "PURE" WATER

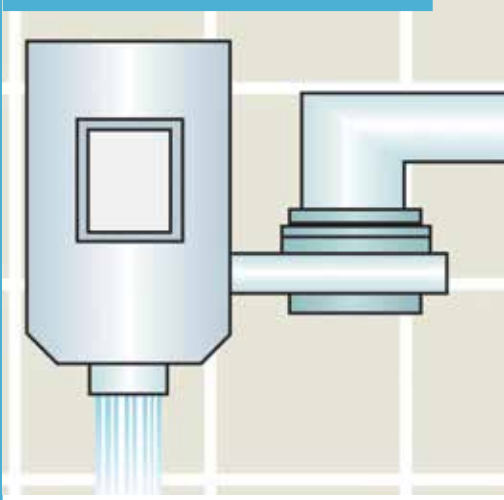
Many companies specializing in water treatment systems would have you believe that their product can eliminate all bacteria, minerals and other contaminants from your water supply, and thereby provide you with "pure" water. No single system is capable of such service. "Pure" water is actually costly to produce, bland-tasting and corrosive.



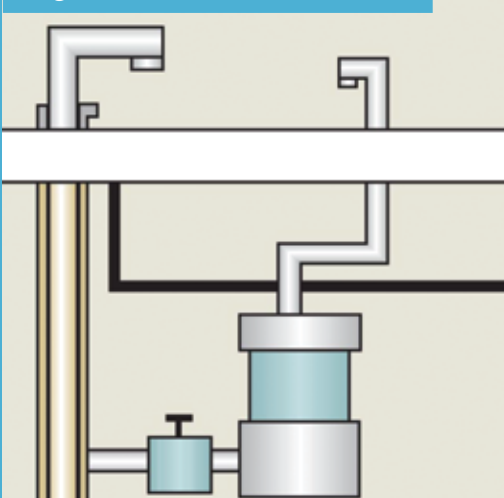
Pour-Through Filters



Faucet-Mounted Filters



High-Volume Filters



When choosing a home water treatment system, remember to ask questions and compare products.

UGA EXTENSION

CHOOSING A WATER TREATMENT SYSTEM

1. Test your well water and talk to your local county Extension agent.
2. If contamination is detected, follow the guidelines provided to locate and try to control the source of contamination. You might not need a treatment system after identifying and eliminating the source of contamination.

BUYER BEWARE

Your best defense against making a bad purchase is to be an educated consumer. Keep the following tips in mind when selecting your home water treatment system.

- Salespeople are not necessarily scientists. In-home testing and demonstrations that indicate poor water quality should be regarded with suspicion and verified by a certified water-testing laboratory.
- Beware of special prizes and other gimmicks that try to force you to buy. Legitimate businesses do not use these practices.
- Any claim that a treatment system has been tested or registered by the Environmental Protection Agency (EPA) is false. The EPA does not test or register these systems.
- To date, no single treatment system can remove all bacteria, chemicals and minerals.

HOME WATER TREATMENT METHODS

In general, home water treatment systems are based on one or a combination of the following basic treatment methods:

- **Filtration** systems use a physical filter to remove contaminants.
 - **Mechanical filters** remove silt, sediment, small organisms and organic matter from water. Two major types are available, either individually or in combination: sand filters and cartridge filters.
 - **Activated carbon or charcoal filters** are usually derived from charcoal, and are commonly found in stores and advertised on television. They are typically used to remove unpleasant tastes and odors as well as small amounts of organic contaminants.
 - **Oxidizing filters** oxidize iron or manganese to the insoluble particulate state and then remove them by mechanical filtration. The two major types of filter media commonly used are manganese greensand and manufactured zeolite coated with manganese oxide.
 - **Neutralizing filters** neutralize water acidity. They are either bed-type filters, which neutralize acidity as the water passes through a bed of calcium carbonate (or magnesium oxide) or chemical feed pump filters, which neutralize acidity by injecting a solution of soda ash (sodium carbonate) into the water supply.
 - **Microfiltration** through a membrane with tiny micropores is used for filtering out very small size particles (less than 1 micrometer) and *Giardia lamblia* cysts or *Cryptosporidium parvum* oocysts.
- **Ion exchange or water softeners** are used to treat hard water (high in calcium and magnesium), which interferes with the cleaning action in soaps and detergents. Be aware that the softening process will increase sodium levels in your water.
- **Chemical oxidation** is used to remove dissolved iron, manganese and hydrogen sulfide. An oxidizing chemical (e.g., chlorine, potassium permanganate or hydrogen peroxide) is injected through a small feed pump and followed up with mechanical filtration.
- **Disinfection methods** such as chlorination, ultraviolet light or ozonation are used to eliminate microbial contamination.
- **Reverse osmosis** is used to remove inorganic contaminants and some organic chemicals with a special membrane. Their rate of removal efficiency decreases with time.
- **Distillation** removes virtually all contaminants. These systems are difficult to maintain, slow working and often provide bland-tasting water.

- **Shock Chlorination** is a treatment procedure—not a treatment system—that kills bacteria.

Depending on the nature and extent of contamination, most of these treatment methods offer two major types of water treatment devices:

- **Point of Entry (POE)** or whole-house treatment systems treat all water entering the home. They are more expensive and are for treating a larger volume of water. They are useful when the water has problems that affect all areas of the home. A common example is a POE ion exchange water softening system that removes calcium and magnesium ions (and some other ions) from hard water.
- **Point of Use (POU)** systems treat water at the point where it is used. These systems are installed at a specific location, such as the kitchen sink, to treat only the water that is used for drinking, cooking, etc.

QUESTIONS TO ASK WHEN PURCHASING WATER TREATMENT EQUIPMENT

With the recent expansion of the home water treatment industry, new products are constantly introduced claiming to solve a variety of water quality problems. Consumers often make costly decisions about water treatment equipment without being well informed. Getting answers to some pertinent questions from water treatment professionals is necessary to ensure a worthy investment. For a list of such questions and their importance, refer to the University of Georgia publication *Water Quality and Common Treatments for Private Drinking Water Systems*, available at your local Extension office and online at: caes.uga.edu/publications. The extent to which the manufacturer or distributor is willing to provide answers to those questions can help consumers make an informed choice.

INDEPENDENT VALIDATION AND CERTIFICATION OF WATER TREATMENT EQUIPMENT

It is important that the water equipment you use is certified by reputable and independent organizations such as the National Sanitation Foundation (NSF) International (nsf.org) and/or the Water Quality Association (WQA, wqa.org). Certification assures that the product will perform as specified on the label. For further information, refer to the University of Georgia publication *Water Quality and Common Treatments for Private Drinking Water Systems*, available at your local Extension office and online at: caes.uga.edu/publications.

UNSEEN PROBLEMS

While some of the problems associated with water quality can be discovered through sight, taste and smell, many of the most harmful contaminants do not affect the odor, taste or appearance of your water supply. These include:

- **Heavy metals** can originate from industrial waste pollution, corrosion of metallic plumbing materials or a natural geological source in the aquifers. Heavy metals can be effectively treated using a deionization, adsorption media, reverse osmosis or water-softening device.
- **Nitrates** are the result of either human and animal waste or fertilizers infiltrating your water supply. Nitrates can be especially harmful to infants, causing a serious blood disorder known as “blue baby syndrome.” Distillation and reverse osmosis remove nitrates, but boiling water should NEVER be used as a treatment, as it concentrates nitrates.
- **Radioactive Contaminants** such as natural radium and radon are major sources of radioactivity in drinking water. Water softening, ion exchange and reverse osmosis can be useful treatments for radium removal. For radon removal, aeration treatment, reverse osmosis or filtering water through granular activated carbon is effective.

Note that no single type of treatment system can take care of all water quality problems and a combination of methods may be needed.

Remember that carefully researching water treatment systems is necessary because of the large number of products available. Understanding your water problem, as well as any prospective treatment plans, is essential for ensuring a safe water supply.



Sources:

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