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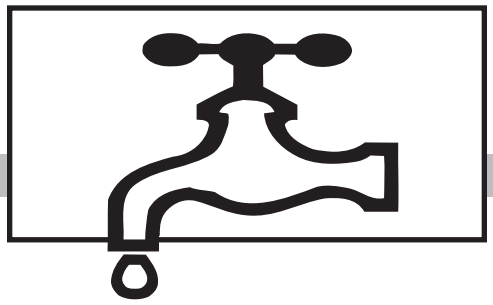

HOUSEHOLD WATER QUALITY

Emergency Supplies of Water for Drinking and Food Preparation

*Kathleen Parrott, Tim Roberts, and Blake Ross**

When preparing for a disaster, it is important to provide for an adequate supply of water for drinking and cooking. In natural disasters, such as floods, hurricanes, or earthquakes, the municipal water supply is likely to be disrupted. Ice storms and other emergencies can cause a loss of electrical power, leaving well pumps unable to function.

Planning for Emergency Water Supplies

Each person in a household needs about 2 quarts of liquid per day for drinking and cooking. This can come from water for drinking as well as other liquids, such as juices or soft drinks. Additional clean water is needed for brushing teeth, bathing, washing utensils and dishes, and flushing toilets. Keep in mind that dehydrated food is a good choice for emergency stores (to avoid spoilage), but additional clean and safe water is needed to prepare it.

In planning for an emergency water supply, there are usually three possible sources of water. With some advance preparation, the water in the household plumbing system can be protected and used. Some water can be stored in separate containers and available for immediate use. Finally, water from a variety of sources, including streams and creeks, can be disinfected for use.

Water in the Household Plumbing

If there is advance warning of an emergency, the water in the household plumbing system can be protected from contamination and available for use. First, shut off the main water valve into the home. This prevents any contaminated water from getting into the home. Also, shut off the valves on any water lines leaving the house, such as an outside faucet. Open a faucet in the highest point in the house (such as an upstairs bathroom) to let air into the system. Then draw water as needed from the lowest faucet in the home (such as a laundry room sink).

Water in the hot water tank or a pressure tank represents many gallons of safe water for use in an emergency. If there is advance warning of the emergency, assure the freshest water supply by flushing the tank. Turn off the gas or electricity to the hot water tank, so there is no risk that the heating unit could come on while the tank is being emptied. Draw water as needed from the drain valve at the bottom of the tank.

Water stored in the plumbing system is safe for only a limited time. Most experts agree that this water will stay safe for only a few days. After a longer time, it must be disinfected before it is used for drinking or cooking. Depending on what has happened, you may need to flush or decontaminate your plumbing system before returning it to normal use.

Storing Water

Water can be stored for short-term use in clean, sanitized containers with covers or lids. If there is advance warning of an emergency, clean large pots, pans, and jugs with hot water and dish detergent. Rinse storage containers with a dilute solution of chlorine bleach (1

* Extension Specialist, Housing; Extension Specialist, Food Safety; Extension Specialist, Biological Systems Engineering, respectively; Virginia Tech

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tablespoon bleach per gallon of water). Fill containers with water. Water stored this way is usually safe for a few days. If you are able to keep the water cold, it is probably safe for about a week. Disinfect water that has been stored for a longer period of time before drinking (see below).

Bath tubs and sinks can be filled with water for emergency use. However, due to the difficulty in getting tubs and sinks clean, this water is not recommended for drinking and cooking (unless disinfected first). This would be a good source of water for cleaning dishes and bathing.

For long term storage of drinking water, such as in preparation for unexpected emergencies, purchase bottled water. Bottled water is prepared under controlled conditions and is available in sealed containers. This water is safe to store until the label expiration date (usually one to two years). Once a year, check stored bottled water to make sure it has not expired.

Disinfecting Water

Unless you are certain that the available water supply is safe, disinfect the water before drinking or using it to prepare food. This includes water that comes from a household plumbing system or that has been stored. Bacteria and other microorganisms can get into water from the air, a container, or other sources. Given adequate time, these microorganisms will grow and multiply, and can make water unsafe to drink.

In some emergencies, household or stored water may not be available. You may need to get water from other "natural" sources, such as a stream, creek, or melted snow. Avoid a stagnant water source, or one known to be contaminated with sewage. Water from natural sources should be filtered before disinfecting. A filter with a pore size smaller than 1 micron is recommended. A portable filter, such as a hiker or camper might use, is a good addition to an emergency kit for your home. Boiling is the preferred way to disinfect "natural" water, as this is the most effective way to kill Giardia (a microscopic organism from human and animal waste).

Boiling

If you have access to a heat source, boiling water vigorously for 10 to15 minutes will make it safe to drink. A full, rolling boil is required.

Chemical Disinfection

Chlorine bleach is used to disinfect water. Household bleach is acceptable, as long as it is a pure bleach product, without additives such as soap, detergent, or perfumes. The amount of bleach required depends on the strength of the product and the amount of water.

Percent chlorine	Drops per gallon of water
1%	40
4% to 6%	8
7% to 10%	4

Mix the bleach and water thoroughly. Let it stand for 30 minutes. The water should still have a slight chlorine odor. If it does not, add another dose of chlorine and let stand for another 15 minutes.

Household iodine, such as used for first aid purposes, is also used to purify water. Use iodine that is 2% USP (United States Pharmocopeia) strength. The amount for disinfection is 20 drops per gallon for clear water. Let the water stand for 20 to 30 minutes. If the water is cloudy, double the amount of iodine. If the water is cold (below 50 degrees Fahrenheit), wait at least an hour. Iodine can cause the water to have an off-taste.

Stores catering to hikers and campers, or drug stores, usually carry chlorine or iodine in tablet, crystal, or drop form to use for disinfecting water. Follow product directions carefully.

References

National Park Service. (1987). Is the Water Safe? Read this Before You Drink. Washington, DC.

Parrott, K., Ross, B., Roberts, T., Wilson, A., & Woodard, J. (1998). Buying Bottled Water (356-486). Virginia Cooperative Extension.

Vernier, V. G. (May/June, 1994). Walking Well. *Appalachian Trailways News*, 55 (2).

Woodard, J., Ross, B., & Parrott, K. (1998). Bacteria and Other Microorganisms in Household Water (356-487). Virginia Cooperative Extension.