NebGuide

University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

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Drinking Water: Storing an Emergency Supply

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Storing water ensures you will have enough to meet your needs if your water supply is disrupted. Follow the guidelines given here to safely disinfect and store water.

Taking time now to store an emergency water supply can prepare you for all types of disasters. The stored supply will enable you to provide for your entire family and possibly others if your water supply is disrupted. Effective methods of preparing water for storage include disinfecting with chlorine and storing at room temperature, disinfecting with chlorine and freezing, or canning.

Need for an Emergency Water Supply

Many people take clean, safe, and readily available drinking water for granted. However, there are many situations when a water supply may be temporarily interrupted due to natural or human causes. Such interruptions may last from a few hours up to several days or weeks. Because water is the most important nutrient for the human body, availability of adequate drinking water is critical. In these situations, an emergency stored water supply is desirable.

One option is to purchase bottled drinking or distilled water at the time of need or for storage and future use. (Refer to NebGuide G1448, *Drinking Water: Bottled, Tap, and Vended* for additional information on bottled water.) Another option is to follow the directions for either method described in this publication to safely prepare and store water from your daily drinking and cooking supply. (For information on treatment of alternative water sources in emergency situations, refer to NebGuide G1494, *Drinking Water Treatment: Emergency Procedures.)*

Amount of Water to Store

In an emergency, an ample water supply is a priority. Needs will differ, depending on age, physical condition, activity, diet, and climate, but most people need to drink at least two quarts (eight cups) of water each day. Hot weather can increase the amount needed. Children, nursing women, and ill people also will need more. In addition to drinking water, supplies for food preparation and hygiene are needed. In general, store at least one gallon of water per person per day. Store at least a three-day supply of water for each member of your family. Never ration drinking water, even when supplies run low. Drink the amount you need today and try to find more for tomorrow. You can, however, minimize the amount of water your body needs by reducing activity and staying cool.

Water Sources

In most cases, your current supply of drinking and cooking water should be suitable for storage. The water should be bacteria and pathogen free. However, the heat treatment described in the "canning water" section should inactivate most pathogens (disease-causing organisms) in the event the water is not potable.

A *public water supply* is defined as one that provides piped water for human consumption to at least 15 service connections or regularly serves at least 25 individuals. Water from a public water supply is regulated by the Environmental Protection Agency (EPA) and Nebraska Department of Health and Human Services (DHHS). EPA and DHHS require all public water suppliers to regularly test for bacteria and other contaminants and deliver water that meets EPA drinking water standards. While you can expect water from a public water supply to be potable, inadequate cleaning of the container used to collect and store the water or other actions could inadvertently result in bacterial contamination. Follow instructions later in this guide for preparing containers.

Private water supplies are not subject to any federal or state regulation, although counties and cities may regulate private water supplies. Therefore, contamination is more likely to go undetected in a private water supply. Testing is the only way to determine if water from a private water supply is potable. Knowing which contaminants may be present should guide the testing, because it is not economically feasible to test for

all possible contaminants. It is generally recommended that private water supplies be tested for bacteria and nitrate at least once a year. Refer to NebGuide G907, *Drinking Water: Testing for Quality*, for testing information.

Water vending machines are systems plumbed into the public water supply where customers fill their own containers with treated water. Vended water is regulated by the Food and Drug Administration (FDA). Since FDA requires that water for vending machines come from an approved public water supply, the assumption is that the water meets EPA drinking water standards. The vending machine normally provides treatment above that done by the municipality. Inadequate cleaning and disinfection of the water vending machine or the container used to collect and store the water could result in bacterial contamination.

Since bacteria can be inadvertently introduced into the water during the collection and storage process, water collected for storage must be treated to inactivate pathogens. Two very different approaches to treating water for storage are discussed below; one using chemical treatment and one using heat. Either method, if directions are followed carefully, will result in safely stored water.

Storage Method 1: Chlorination Followed by Shelf Storage or Freezing

Containers to Use

Many types of containers are available for water storage, including those made of glass and plastic. Glass provides an effective container for water storage but is easily broken and heavier than plastic. Glass containers manufactured and advertised for food storage will be safe. There are many types of plastic containers manufactured; some are not recommended for water storage because harmful chemicals could leach into the water.

Plastic containers manufactured and used for food or beverage storage or which are advertised as food-quality containers will be safe. Plastic jugs with tight fitting, secure lids that have contained juice, punch, or other edible substances are safe for emergency water storage. However, these containers can degrade over time and should not be used repeatedly. In addition, avoid using plastic milk containers if possible, as fat traces may remain. If used, wash thoroughly, giving special attention to hard-to-reach areas such as handles. New containers can be purchased in most housewares and sporting goods departments, as well as at some water vending locations. New containers should be labeled for storage of food or beverages. Some containers deemed safe for water storage may affect the taste of stored water.

Preparing Containers

Wash the containers and lids thoroughly with hot tap water and dish detergent. Rinse thoroughly with hot tap water, or wash in a dishwasher.

Treating Water for Storage

While the water being stored should be free of disease causing organisms, bacteria can be inadvertently introduced into the water during the collection and storage process; therefore, treating the water with a chemical disinfectant will inactivate organisms that might be present in the storage containers, or that might be introduced as the water is collected.

Some, but not all, public water supplies are disinfected with chlorine or chloramines. These water supplies may contain enough residual disinfectant to deactivate pathogens that might be introduced during the water storage process, making additional treatment prior to storage unnecessary. For water supplies that are not disinfected with chlorine or chloramines, or for an additional safety margin, follow the directions below.

To treat unchlorinated or unchloraminated potable water for storage, use liquid household chlorine bleach that contains 4 to 6 percent sodium hypochlorite. Chemical treatment provided by the bleach will inactivate pathogens that may be introduced through unsterile containers or when filling the containers. Bleaches with labels such as "Fresh Wildflowers," "Rain Clean," "Advantage," or labeled as scented may contain fragrances, soaps, surfactants, or other additives and should not be used for drinking water disinfection. Use the freshest container of liquid chlorine bleach available, preferably not more than three months old. Add six drops of bleach per gallon of water using a clean uncontaminated medicine dropper.

Stir the water, cover, and allow it to stand for 30 minutes. You should be able to smell chlorine after the 30-minute waiting period. If you cannot, add another dose and let the water stand covered another 15 minutes. Cap containers and label each, describing the contents and preparation date.

Storing Water

Water treated as above can be stored in one of two ways: shelf storage at room temperature or frozen.

For shelf storage, store containers in a cool, dry place away from direct sunlight. Most plastic beverage containers degrade over time. Storing them away from heat and light will slow down degradation and reduce the chance of leakage. Store water in plastic containers away from gasoline, kerosene, pesticides, or similar substances because vapors from these products can penetrate plastic. Glass does not degrade and is nonpermeable to vapors and gases. Remember, water weighs over eight pounds per gallon, so make sure the shelf or storage area is strong enough to support the weight. For best quality, use or replace shelf-stored water every six months.

Water prepared in this manner can also be stored in a freezer. Leave 2 to 3 inches of air space in the top of containers before freezing to prevent the container from bursting as water expands during freezing. Some thin-walled containers may break regardless of the air space provided. Avoid freezing water in glass containers. If you lose electricity, the frozen water will keep foods frozen for a period of time (two days).

Storage Method 2: Canning Followed by Shelf Storage

Containers to Use

You can store water in food-grade glass fruit jars with flat metal lids and metal screw bands. Jars should be manufactured and rated for canning food.

Preparing Containers

Wash the containers and lids thoroughly with hot tap water and dish detergent. Rinse thoroughly with hot tap water.

Treating Water for Storage

Fill clean quart fruit jars with water, leaving 1 inch of head space (air space) at the top of each jar. Place a flat metal lid and a metal screw band on each jar.

Fill a canner half full with water. Preheat the water to 140°F. Place the filled jars into a canner rack and use the handles to lower the rack into the canner — or add the filled jars to the canner one jar at a time with a jar lifter. Add more boiling water to the canner, if needed, so the water level in the canner is at least 1 inch above the jar tops. Bring the water to a vigorous boil. Cover the canner with a lid and lower the heat to maintain a gentle boil. Boil for 20 minutes, adding more boiling water, if needed, to keep water level above the jars. When jars have been boiled for 20 minutes, turn off the heat and remove the canner lid. Using a jar lifter, remove the jars and place them on a towel, leaving at least a 1-inch space between jars during cooling. Do not retighten lids.

Cool the jars at room temperature for 12 to 24 hours. As jars cool, the contents contract, pulling the self-sealing lid firmly against the jar to form a high vacuum seal. Check for sealed lids by pressing the middle of the lid with a finger or thumb. If the lid springs up when you release your finger, the lid is not sealed. Screw bands can be removed after jars are cooled.

It is worth noting the difference between heat treatment for water disinfection versus heat treatment for water steriliza-tion. NebGuide G1494, *Drinking Water Treatment: Emergency Procedures*, provides instructions to bring water to a vigorous boil for disinfection purposes. The process of bringing water to a boil disinfects the water, inactivating harmful bacteria and making it bacteriologically safe for consumption in the short term. The process of boiling jars filled with water for 20 minutes sterilizes the water in the containers. Sterilization kills all organisms ensuring no regrowth can occur and making water bacteriologically safe for long term storage.

Storing Water

Store containers in a cool, dry place away from direct sunlight. Canned water can be stored for an indefinite period of time.

Steps To Take When Using Emergency Water Supply

For best quality, stored water should be used within six months; however, water can be safely stored for longer periods as noted above. To improve the taste of water stored for a long time, pour it back and forth between two clean containers several times to aerate it.

Regardless of how water was treated and stored, measures should be taken to control exposure to bacteria once containers are opened. To reduce the chance of water contamination, open only the containers you will use immediately. If electricity is available, store opened containers in a refrigerator at or below 40°F. Avoid introducing bacterial contamination into the stored water:

- Don't put dippers or spoons into containers.
- Don't drink directly out of a container.
- Keep container openings and lids clean.

Use water in opened containers within one or two days.

Summary

There are numerous situations in which a water supply may be temporarily interrupted due to natural or human causes. In these situations, an emergency water supply can be desirable. In general, store at least one gallon of water per person per day of expected need. In most cases your drinking and cooking water should be suitable for storage. Water can be stored at room temperature or frozen after disinfecting with chlorine; or water can be stored at room temperature after canning. Either method requires following the methods described above.

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