

Treating and Storing Water for Emergency Use

Cooperative Extension Service
College of Agriculture and
Home Economics



Guide M-116

Craig Runyan, Program Coordinator

This publication is scheduled to be updated and reissued 10/05.

There are several methods for storing emergency quantities of potable water for uses such as drinking, cooking, or brushing teeth. Any of the following methods can be used to store water for emergency preparedness. To keep water fresh and fit for human use, it is a good practice to rotate water supplies every 2 to 4 months. Prolonged or regular use of stored water treated by the following methods is not recommended.

FILTER THE WATER

The first step in bottling water is to clear the water by letting it settle for several hours, then filtering it through a clean cloth. (If the water source already has a sediment filter installed, this step may not be necessary.) Filtering removes organic matter such as soil or vegetative debris. Bacteria that have already bonded to these materials are hard to kill during disinfection.

SELECT AND PREPARE STORAGE CONTAINERS

Plastic containers are best. Restaurants that use large quantities of cooking oil are inexpensive sources of large (5 gallon) plastic containers. Restaurants usually discard the cooking oil containers, so you may be able to get them simply by asking. Glass also makes an excellent container, but its potential for breakage makes it less desirable. Avoid metal containers for prolonged storage. This is particularly true when using certain disinfectants. Acid-based disinfectants, for example, can react with certain metals to release contaminants into the water, thus making it unsafe for consumption.

Be certain the storage containers are clean. They do not have to be sterilized because the stored water will be disinfected. However, wash the containers thoroughly, then triple rinse with clean, fresh water. Be sure to completely rinse any cleansing agent from the containers.

DISINFECT THE WATER

Boiling

Water to be stored can be boiled to disinfect it. Boiling for at least 2 minutes (at a rolling boil from the time it starts to cook) will kill most disease-causing organisms. If you suspect the presence of harder-to-kill organisms, such as giardia or *Crypto sporidium*, boil the water longer. However, do not boil the water more than 5 minutes. Excessive boiling increases the chance of toxicity by concentrating metals, salts, and chemical impurities (such as aluminum, iron, and nitrates) that do not evaporate out.

If more than a few gallons (5-10) are to be stored, it may become impractical to disinfect by boiling. In that case, use a chemical disinfection procedure.

Chlorination

The procedure for chlorine disinfection of water is sometimes written on the product label. If so, follow the manufacturer's recommendation. If not, add 10 drops of common household bleach (5.25% concentration) to 1 quart of water. Do not use bleach that contains a cleansing agent.

Shake or mix the treated water thoroughly, tighten the lid, and let the water stand for 30 minutes. If at the end of 30 minutes the water does

not have a slight chlorine odor, repeat the dosage and allow the water to stand for 15 minutes more.

Following treatment, remove the lid and leave the water exposed to the air. This allows the chlorine to escape into the atmosphere. The water can be stirred or shaken at 15 to 30 minute intervals to speed this process. The process is complete when there is no more chlorine odor (or taste). In a well-sealed container, water should stay fresh for several months.

Other Chlorination Treatments

Granular calcium hypochlorite can be used to disinfect water by dissolving 1 heaping teaspoon (about 1/4 ounce) in 2 gallons of water. Use one part of this mixture to treat 100 equal parts of water (1 pint of solution per 12.5 gallons of water).

Chlorine tablets for disinfecting drinking water can be purchased. When instructions are not available, use 1 tablet per quart of water.

As when using chlorine bleach, let the treated water stand 30 minutes in a sealed container. Then remove the lid and expose the water to air. Allow time for the chlorine odor to escape.

Iodine

For those who are allergic to chlorine or find it objectionable, iodine can be used to effectively disinfect water.

When using *tincture of iodine* (or common household iodine), add 5 drops of 2% (U.S.P.) iodine to each quart of clear water. For turbid water, add 10 drops per quart. Let the treated water stand for at least 30 minutes. Iodine will not volatilize as readily as chlorine, so it is harder to remove the odor and taste. However, small quantities are not harmful.

Iodine tablets can be purchased for disinfecting water. If instructions are not available, 1 tablet per quart of water is usually recommended. Hunting supply and military surplus stores are good sources of iodine tablets.

Ultraviolet Disinfection

Water can be disinfected by exposing it to ultraviolet sunlight radiation. To accomplish ultraviolet disinfection, the water must be stored in clear containers so the ultraviolet rays can pass through. Also, the smaller the container, the more effective the process. However, if the container is periodically shaken to stir the water, the treatment is more effective for even larger containers. Expose the water to intense sunlight for 6-8 hours. Setting the container on a mirror increases the ultraviolet effect.

While this procedure is proven to work for most common water-borne bacteria, it has not been tested to prove the effectiveness on harder-to-kill organisms (such as oocysts).