WATER PURIFICATION METHODS (Updated in 2024)

By Gemie Martin

The Church website suggests a two-step process for treating water. It must first be clarified (the debris must be filtered out) before it can be disinfected. See: <https://www.churchofjesuschrist.org/topics/food-storage/drinking-water-guidelines?lang=eng>.

There are several products that can be used to purify water. The best will kill or remove bacteria, viruses, protozoa, and cysts in contaminated water. Read the packaging. Keep in mind that only reverse osmosis filter types can remove all chemicals. In our day and age where many water sources have been contaminated by industrial wastes, this is an important consideration. These types of filters are expensive.

**Boiling** may not be your best option for purifying your water. (It may not be an option at all). Bring water to rolling boil for 3-5 minutes. In higher elevations where water boils at a lower temperature, boil for a longer time. NOTE: These heating methods are not sufficient to kill cryptosporidium a harmful microorganism which causes diarrhea. Boiling or heating water does not remove toxins.

**Pasteurization** is now also being suggested. A WAPI (WAter Pasteurization Indicator) is a tiny device to let you know when water has reached the 149° F. (a temperature necessary to kill most organisms). Keep it at or above 149°F. for at least 20 minutes before drinking to render Cryptosporidium or other harmful organisms non-infectious. A WAPI can be obtained online. Put “water pasteurization indicator,” into your search engine. These devices can be reused. You will need a source of heat (like a Sunoven, or regular oven) to heat your water up. Pasteurization does not remove toxins.

**Chlorine Dioxide** kills nearly all organisms including cryptosporidium. It takes four hours to work. It comes in different forms. Katadyn makes Micropur tablets. Aquamira (chlorine dioxide drops or liquid can also be purchased. Chlorine Dioxide is very toxic if ingested so care must be taken to keep it (and the water as it is being treated) away from children.

**Chlorine** (sodium hypochlorite—household bleach) kills most organisms. It weakens over time and has about a 6-month shelf life. Mix it with cold water to dilute. Hot water may inactivate it. My research tells me that it is not effective at killing the dangerous protozans giardia and cryptosporidium. Use only unscented household bleach without thickeners or other additives. Check to make sure the strength is at least 5.25% sodium hypochlorite. Some brands may be weaker. To treat one quart of water, use two drops of bleach and let it set at least 30 minutes before drinking. For one gallon, use 8 drops. For 5 gallons, use ½ teaspoon, and for a 55-gallon drum, use 5 ½ teaspoons. If the water is cloudy, double the amount of bleach.

**Calcium Hypochlorite** (also called pool shock). It stores indefinitely in dry form. Make sure there are no other pool chemical additives in the pool shock you purchase and that it has a 68%-70% Calcium Hypochlorite content. Store in glass or plastic, NOT metal (even a metal lid WILL corrode). In my experience, it will deteriorate the bag you purchase it in. I recommend storing it in a glass jar with a heavy-duty plastic lid and put that jar in a plastic bucket with a lid and store it out of reach of children. Before using it, shake or turn your bottle with dry granules to make sure the Calcium Hypochorite is mixed even throughout. A heaping ¼ teaspoon dry will treat 55 gallons of water. If you mix two (2) Tablespoons into a quart of water (or 8 Tablespoons per gallon of water), you have a solution that can be used at the same rate as regular chlorine bleach to disinfect your water for drinking (see **Chlorine** above). It is recommended that you store this solution in a plastic bottle out of reach of children. Like the regular chlorine bleach, once it is mixed with water, it will lose its strength over time. Here is an article that has information on how to make the solution using Calcium Hypochlorite to treat your water: <https://theprovidentprepper.org/disinfecting-water-using-calcium-hypochlorite/> I also recommend watching this video: <https://www.youtube.com/watch?v=jKXhK0MA1XY>

**UV Light** can be used to inactivate organisms. The SteriPEN is such a devise. It will inactivate all organisms including giardia and cryptosporidium. The downside is that the water needs to be very clear or the light will not be able to get to all the microorganisms. The upside is that it is very small and can easily fit into your 72-hour emergency kit. Does not remove toxins.

**Filters** can be the most comprehensive method for purifying water. They can reduce some harmful chemicals as well as organisms. You should look for one that can filter to 0.1 microns in order to filter out harmful bacteria and protozoa. A 0.2 filter will filter out nearly everything a 0.1 filter will. The Katadyn Combi uses two types of filters. The 0.2-micron ceramic filter removes bacteria and protozoa including giardia and cryptosporidium. The carbon filter reduces chemicals and bad taste. Filters can be costly to purchase and maintain, so do some research to make sure you are getting what you need for your situation.

The Church distribution store sells an Aquamira water filtration bottle (a sport-type bottle that provides filtration and drinking from the same bottle). Find it at: <https://store.churchofjesuschrist.org/search?q=water+filter+bottle>. Katadyn also makes a similar one that can also be purchased at sporting goods stores or online. Sawyer makes a number of portable personal water filters that filter down to 0.1 microns. Purchase in sporting goods stores or online.

The LifeStraw Personal Water Filter can filter down to 0.2 microns. These would work well for each individual backpack. They do not remove chemical contaminants. Once again, the water source must have debris filtered out before drinking from the LifeStraw or it will clog up, allowing no water through for you to drink.

**Solar Sterilization of Water.** Clear water must be used. Put water in a clear 2-liter bottle (empty soda bottle works). Leave laying down in the sun against a reflective surface for 6 hours (if sunny) or 2 days (if cloudy). Does not remove toxins.

**Note**: If your water has been sitting undisturbed for a time if will taste “flat.” This means that some oxygen has escaped from it. It is easy to re-oxygenate by pouring it from one container to another before drinking.