



Water Quality: Bottled Water

Water is one of our most abundant chemical compounds. It also is one of the most debated substances as far as safety is concerned.

Many people buy water as a primary source of drinking water, because their water is unsafe (whether perceived or from test results) or has an "off" taste or odor. Bottled water is best used only as a temporary measure in small quantities, since the cost averages about 5 cents per gallon.

Is bottled water, in fact, better than tap water? It depends on the source and the treatment for the water. Tap water and bottled water are subject to regulations. Disinfection of water is completed with ozone or chlorine.

How long chlorine and ozone remain active in the water depends on many factors, including temperature. Chlorine residual usually provides disinfections throughout the public-water distribution system. Ozone, a high-strength oxygen that reverts to normal oxygen, also can provide a residual disinfection for a limited time.

However, bottled water might be in distribution for several weeks, and storage conditions, especially temperature, are important for maintaining quality. In terms of bacteria content, it is questionable as to whether bottled water is better than most municipal tap water.

Bottled water often is purchased for its good taste; however, taste is not an indicator of safe water. Many harmful substances, such as pathogen (disease-causing organisms), nitrate, trace heavy metals (lead and mercury), pesticides, and some organic materials, have no taste.

Water naturally contains varying amounts of carbon dioxide, calcium, iron compounds, sodium, fluoride, and other minerals and mineral salts. All are substances that affect taste. Differences in the amounts explain why the taste of tap water varies from one area to another.

Bottled water processed from city water systems, wells, or springs varies in mineral content, from low to high in "mineral" waters. Sometimes minerals are added in processing to improve the flavor of water.

Types

When water is bottled, the processing can add to the variety in composition and flavor. There are several types of bottled water produced domestically, and each is processed differently.

Mineral-free water or **distilled water** is treated to remove the minerals that occur naturally in water. Almost all sodium is removed by these processes. The resulting water is rather flat and tasteless for drinking because of the lack of minerals.

Drinking water comes from municipal water systems, wells, or springs. It often is treated by reverse

osmosis to remove bacteria and other pathogens and most pesticides. The resulting water is purified but still contains some dissolved solids.

Natural water comes from unprotected well or spring systems and is bottled without extensive treatment. This water typically is free of the trace chemical additives found in many public water supplies. However, it contains most of the mineral contaminants commonly picked up by water as it moves through the air, soil, and rock materials. Because this is almost exclusively groundwater, it usually contains a range of minerals and is, therefore, quite flavorful.

Spring water rises naturally to the surface from underground. Artesian water also rises under its own pressure, but only after it has been reached by drilling.

Mineral water is from a natural spring or underground source. The mineral content is not modified by the manufacturer and can contain some dissolved solids. It can be still or sparkling. The carbon dioxide that causes carbonation is natural or added during bottling.

Fluoridated water contains some levels of fluoride, from the source water or added by the manufacturer.

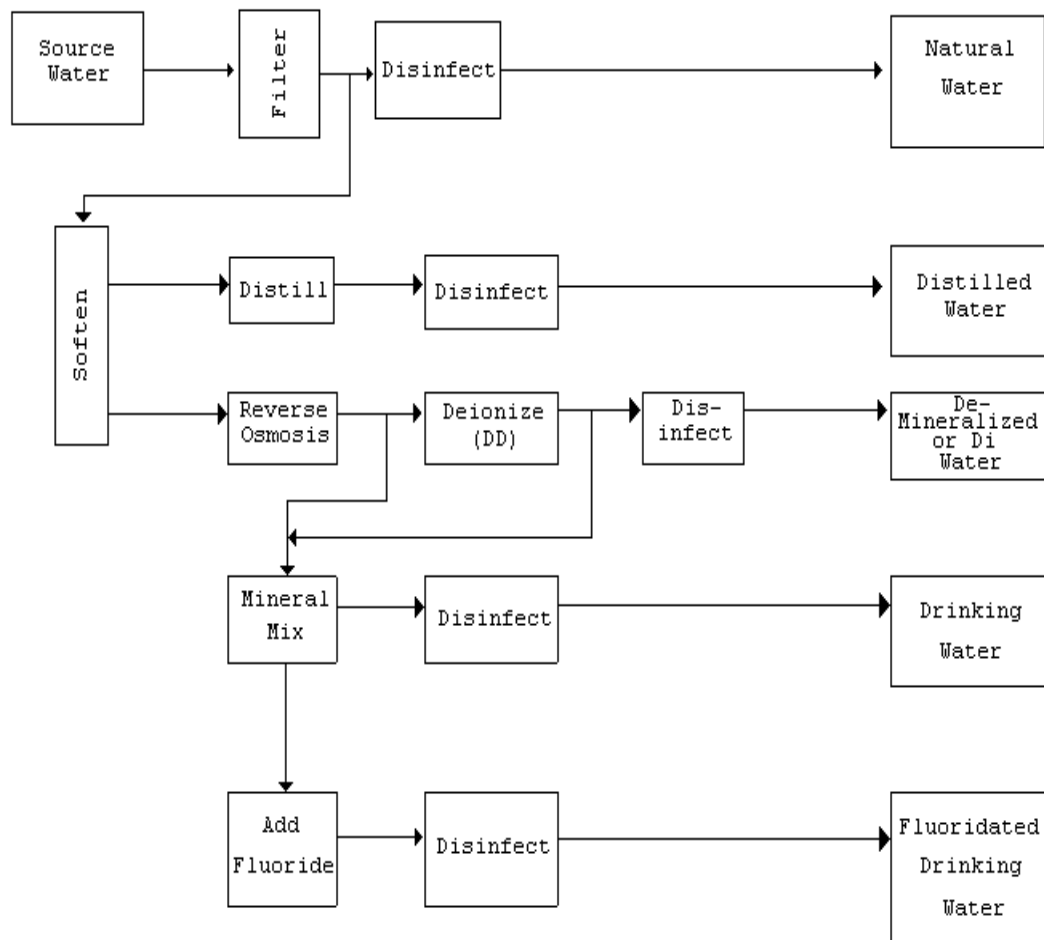
See [Figure 1](#).

Summary

Bottled water has advantages as a low-sodium, low-nitrate, or better-tasting water. It is recommended as a short-term alternate supply. For extended use, there are less expensive and more convenient alternatives than bottled water.

The types of bottled water--mineral-free, drinking, natural, mineral, and fluoridated--range from highly treated to little treatment. Bottled water, when tested for contaminants and taste, was rated as good as but no better than many city water supplies.

Figure 1. Water Treatment Processes.



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