

SAFE DRINKING WATER – 2015

Drinking water or **potable water** is water safe enough to be consumed by humans or used with low risk of immediate or long term harm. In most developed countries, the water supplied to households, commerce and industry meets drinking water standards, even though only a very small proportion is actually consumed or used in food preparation. Typical uses (for other than potable purposes) include toilet flushing, washing, and landscape irrigation. The word **potable** came into English from the Late Latin *potabilis*, meaning drinkable.

Over large parts of the world, humans have inadequate access to potable water and use sources contaminated with disease vectors, pathogens or unacceptable levels of toxins or suspended solids. Drinking or using such water in food preparation leads to widespread acute and chronic illnesses and is a major cause of death and suffering worldwide in many different countries. Reduction of waterborne diseases and development of safe water resources is a major public health goal in developing countries.

Water has always been an important and life-sustaining drink to humans and is essential to the survival of most other organisms. Excluding fat, water composes approximately 70% of the human body by mass. It is a crucial component of metabolic processes and serves as a solvent for many bodily solutes. The United States Environmental Protection Agency in risk assessment calculations previously assumed that the average American adult ingests 2.0 litres per day. Bottled water is sold for public consumption in most habitated parts of the world.

Although covering some 70% of the Earth's surface, most water is saline. Freshwater is available in almost all populated areas of the Earth, although it may be expensive and the supply may not always be sustainable. Sources where water may be obtained include:

- [ground](#) sources such as [groundwater](#), [hyporheic zones](#) and [aquifers](#).
- [precipitation](#) which includes rain, hail, snow, fog, etc.
- [surface water](#) such as rivers, streams, [glaciers](#)
- [biological sources](#) such as plants.
- the [sea](#) through [desalination](#)
- [water supply network](#)
- [Atmospheric water generator](#)

Spring water is groundwater that rises to the ground surface. Springs are often used as sources for bottled waters. Tap water, delivered by domestic water systems in developed nations, refers to water piped to homes and delivered to a tap or spigot. For these water sources to be consumed safely they must receive adequate treatment and meet drinking water regulations.

The most efficient way to transport and deliver potable water is through pipes. Plumbing can require significant capital investment. Some systems suffer high operating costs. The cost to

replace the deteriorating water and sanitation infrastructure of industrialized countries may be as high as \$200 billion a year. Leakage of untreated and treated water from pipes reduces access to water. Leakage rates of 50% are not uncommon in urban systems.

In the U.S, the typical single family home uses 69.3 gallons (262 litres) of water per day. This includes (in decreasing order) toilet use, washing machine use, showers, baths, faucet use, and leaks. In some parts of the country there are water supplies that are dangerously low due to drought, particularly in the West and the South East region of the U.S.

Parameters for drinking water quality typically fall under three categories:

- physical
- chemical
- microbiological

Physical and chemical parameters include [heavy metals](#), trace [organic compounds](#), [total suspended solids](#) (TSS), and [turbidity](#).

Microbiological parameters include [Coliform bacteria](#), [E. coli](#), and specific pathogenic species of [bacteria](#) (such as [cholera](#)-causing [Vibrio cholerae](#)), [viruses](#), and [protozoan parasites](#).

Chemical parameters tend to pose more of a chronic health risk through buildup of heavy metals although some components like nitrates/nitrites and [arsenic](#) can have a more immediate impact. Physical parameters affect the aesthetics and taste of the drinking water and may complicate the removal of microbial pathogens.

Originally, fecal contamination was determined with the presence of [coliform bacteria](#), a convenient marker for a class of harmful [fecal pathogens](#). The presence of [fecal coliforms](#) (like [E. Coli](#)) serves as an indication of contamination by [sewage](#). Additional contaminants include [protozoan oocysts](#) such as [Cryptosporidium sp.](#), [Giardia lamblia](#), [Legionella](#), and [viruses](#) (enteric). Microbial pathogenic parameters are typically of greatest concern because of their immediate health risk.

Throughout most of the world, the most common contamination of raw water sources is from human sewage and in particular human fecal pathogens and parasites. In 2006, waterborne diseases were estimated to cause 1.8 million deaths each year while about 1.1 billion people lacked proper drinking water. It is clear that people in the developing world need to have access to good quality water in sufficient quantity, water purification technology and availability and distribution systems for water. In many parts of the world the only sources of water are from small streams often directly contaminated by sewage.

Sources of Information:

United States Environmental Protection Agency

Wikipedia