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Keine Stimmen

Wen da dürstet ...



Nur ein kleiner Prozentsatz des Wassers auf der Erde ist Trinkwasser - vieles ist Salzwasser oder verschmutzt. Wie man in der freien Natur zu Trinkwasser kommt, erklärt dieser Artikel.

Drinking water

97 percent of the world's water reserves are salty. Two thirds of the rest is frozen in the form of ice in the two polar regions. Just one percent is fresh water, but even this is far from being drinking water.

How do I get ready-to-drink water in nature?

We know from television, radio and newspapers that drinking water could be in short supply worldwide. But who has really suffered from thirst themselves? In Switzerland, probably very few (or then only because too few drinking bottles were carried on the hike).

The following describes some of the methods we use to turn contaminated water into drinkable water.

Impurities

Microorganisms

The most common health risk is the ingestion of pathogens such as bacteria (coliform bacteria, salmonella, cholera), viruses (hepatitis A, polio virus) and protozoa (e.g. amoebae) from drinking water. Human and animal faeces are the main sources of such contaminants.

These small and tiny organisms are usually smaller than a hundredth of a millimeter (protozoa), sometimes even smaller than a ten-thousandth of a millimeter.

Various methods can be used to deal with these contaminants. Boiling is the simplest method. As some of these organisms can survive high temperatures for long periods of time, various factors must be taken into account (see below).

Ultraviolet radiation (sunlight or artificial UV light) is not only unfavorable for human skin, but also helps to kill the germs in the water.

Chemical additives (disinfectants) can also be used to render microorganisms harmless. Depending on the agent, the water must be treated for up to several hours.

Bacteria and protozoa can also be filtered relatively easily. Protozoa in particular are highly resistant to chemicals. They must therefore be treated with filters, especially because of their size.

Heavy metals

Heavy metals such as lead, copper, mercury, zinc, etc. originate from natural (weathering of rocks) and artificial (chemical plants, air pollution) sources. The metal compounds are deposited in the human body and are not excreted, or only to a small extent.

The heavy metals can only be removed from the water using complex processes. There are no simple methods that can be used on a hike or in a camp.

Agricultural additives

Weedkillers, pesticides and fertilizers are mainly to be expected in industrialized regions. However, such additives have also been found far above the agricultural zone (e.g. in mountain lakes) - they were carried to remote areas by evaporation and rain.

Most of these substances can be removed from drinking water with little effort using activated carbon.

Turbidity

Turbid water is usually caused by eroded rock and soil. Especially after storms and below glaciers, the turbidity is

Turbidity is high. Turbidity as such is harmless. However, because such suspended matter often also binds microorganisms, it is not harmless.

Suspended solids can be removed from the water using filter processes. Soil is a very efficient filter, which is why groundwater (provided it is not contaminated with microorganisms or heavy metals) is used as drinking water in many countries.

Turbid water has the disadvantage that the suspended matter binds to chemical disinfectants and thus weakens them. For this reason, it must be filtered before disinfection.

Radioactive contamination

There is no treatment method for contaminated water. This water must be avoided at all costs.

Drinking water treatment

Boiling

Boiling water is probably one of the oldest and most effective ways of disinfecting water. The prerequisite is that sufficient time and energy (wood, fuel, electricity) is available. Only microorganisms can be eliminated using this method.

Different organisms can survive at different temperatures. Since in most cases it is unknown which germs are to be expected, the most resistant ones must be assumed. At sea level, water boils at 100 °C, so 5 minutes of boiling is enough to kill all germs. At 3000 meters above sea level, the water boils at 90 °C. A quarter of an hour's boiling time is required to kill the germs.

Sodis

Sodis (Solar Water Disinfection) is a special form of boiling. Here, water is heated using clean PET or PVC bottles, half of which are dyed black or placed on a dark surface. The water must first be filtered. The UV radiation from the sun also kills the germs. This simple procedure is particularly suitable in warmer regions, but can also be used in Switzerland. For six hours (in southern climes and in fair weather) or two days (in temperate zones), all germs are killed by the sun's rays and the resulting heat. This method is particularly suitable where there is sufficient time (fixed location) and no energy in the form of fire, electricity or fuel.

Disinfection

Disinfectants are substances that kill microorganisms and thus prevent the transmission of disease. These substances include iodine, silver, ozone and chlorine (as gas or salt).

Silver, iodine and chlorine are particularly suitable for on the go, although only silver is tasteless. The Micropur tablets or powder available in drugstores and outdoor stores are based on silver and are very easy to use. Silver keeps the water bacteria-free for at least six months. However, Micropur is not effective against viruses, amoebae and worm eggs. If these pathogens are suspected, a combination with other methods should be considered.

The use of iodine shows changes in taste. In addition, weeks of iodine intake can lead to hyperthyroidism. An activated charcoal filter after disinfection reduces the iodine content.

Chlorine has no long-term effect. It can therefore only be used to a limited extent in storage facilities. In addition, chlorine is not harmless in the wrong dosage. The taste of water disinfected with chlorine by public authorities can be removed with antichlorine.

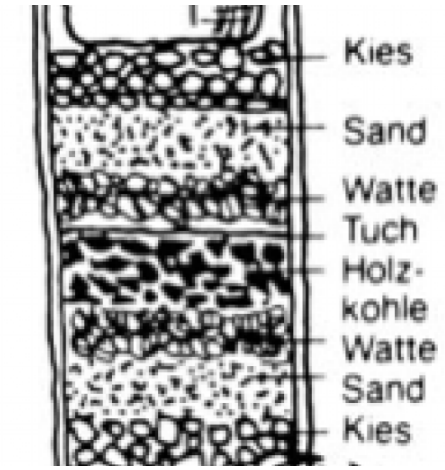
Filters

Various filters are available on the market. Ceramic and fiberglass-based products are particularly suitable for outdoor activities. Different devices are available depending on the amount of water to be filtered and the turbidity or microorganism content. Activated carbon can also be used for filtering. This has the advantage that substances from agriculture and the natural weathering of rocks and soil are also reliably removed.
In the Jungschar, water can also be filtered with an "artificial soil" as a makeshift solution. An alternating layer of sand, gravel, coal and mudflats at least reduces turbidity and removes agricultural additives (see picture).

Desalination

Complex processes are required to remove sea salt. However, there are also products on the market that use simpler methods to remove salt from the water, although the cost makes their use in the Jungschar more questionable.

"Artificial bottom" filter



Poisoning

In any case, it is worth considering carefully whether disinfection or filtration is required. This is illustrated by the following example: In a youth school course in Thurgau, a group filled their water canister with fresh stream water. Without recognizing any turbidity or suspended particles, they assumed that the water was drinkable. It turned out differently: diarrhea and severe headaches for all group members were the result. Was it a case of lead poisoning (the catchment area of the stream unfortunately includes the target slope of a weapons range) or surface water contaminated with faeces? Whatever the cause, the situation was anything but pleasant for the people involved. If poisoning does occur, the effects of diarrhea can be alleviated or remedied with appropriate tablets (charcoal tablets or Immodium®, for example).

However, it is always worth paying attention to the contamination before the damage is done.

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Source reference



- **Content and picture:** Forum Kind issue 2/04 , page 21. Only a small percentage of the water on earth is drinking water - much of it is salt water or polluted. This article explains how to obtain drinking water in the wild. © Copyright www.forum-kind.ch
- **Author:** Lori Keller

Weitere Informationen

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