Hygienic handling of mineral, spring and table water as well as drinking water in the household

Questions and answers by the BfR dated 22.03.2022

Water, be it as mineral, spring, table or tap water is an excellent thirst quencher and an essential part of a balanced diet. The German Federal Institute for Risk Assessment (BfR) answers FAQs about microbial risks related to mineral, spring and table water, and explains the differences to drinking water from the tap.

What are mineral, spring and table waters?

Natural mineral water is water that originates from underground water deposits that are protected from contamination. It is tapped from natural or artificially created springs. Natural mineral water has original purity and stands out thanks to its minerals, trace elements and other constituents; although the composition, temperature and the remaining important features remain constant within a range of natural fluctuations. The mineral constituents may only be changed in a few cases regulated by law (for instance, the reduction of uranium or arsenic). Natural mineral water can only be sold commercially, if it has been officially certified. This certification is issued on request, if the water fulfils the requirements with respect to tapping, composition and important features as defined in the German Mineral and Table Water Regulation (MTVO from 1st August 1984 (BGBI. I page 1036), in the latest version).

Spring water originates in an underground water table or deposit and emerges from a spring tapped at natural or bore exits; however it is not subject to official certification or usage approval. Spring water must meet the same microbial requirements as natural mineral water; the same also applies to tapping and bottling that are also defined in the MTVO.

According to MTVO, table water can be produced from drinking and natural mineral water, from naturally high salinity water (natural brine), by sweating natural water enriched with salts, and also by using sodium chloride and magnesium chloride Also, table water is not always produced from spring water, it can also be made from drinking water.

What is the difference between mineral, spring and table water?

Drinking water is primarily produced from groundwater via springs, or it can also be tapped directly from surface waters such as rivers and lakes or springs, or as bank filtrate from surface waters. Drinking water also includes any water that is used to drink, cool and prepare food and beverages or for other household uses (personal hygiene, dishwashing etc.). The requirements relating to drinking or tap water are defined in the German Drinking Water Ordinance (TrinkW), the Ordinance about the General Conditions for Water Supplies (AVBWasserV) and in the DIN 2000 Central Drinking Water Supply. The Federal Environment Agency is responsible for assessing the health risk of drinking water https://www.umweltbundesamt.de/themen/wasser/trinkwasser. Packaged water, such as spring and table water, is governed primarily by the regulations of the Mineral and Table Water Ordinance and secondly by the Drinking Water Ordinance; only the regulations of the Mineral and Table Water Ordinance apply for natural mineral water.

However, mineral, spring and table water that is usually sold in finished packaging or in beverage dispensing systems falls under the German Food Act. Also, mineral water is one of the few foods in Germany that may only be distributed after it has been officially recognised; although the requirements relating to the recognition are defined in a General Administrative Regulation. The list of officially recognised mineral water sources and brands has been published on the website of the Federal Office of Consumer Protection and Food Safety (BVL)

(https://www.bvl.bund.de/SharedDocs/Downloads/01_Lebensmittel/datenmanagement/mineralwasser_deutsche.html). A comparable list of the mineral waters recognised by the Member States of the European Union (EU) has been published by the European Commission.

In contrast, healing waters are not considered food, instead they are classified as a medicinal product and therefore fall under the German Pharmaceutical Act.

What are the legal quality requirements for mineral, spring and table water?
The legal requirements for mineral, spring and table water are defined in the EU Directive 2009/54/EC relating to the tapping and exploitation of natural mineral waters and the national Mineral and Table Water Ordinance (MTVO). These regulations include requirements for mineral and table water with respect to tapping, production, treatment and distribution. The detailed requirements relating to the certification and exploitation approval of natural mineral water are laid out in the general administrative act on the approval of and the licence to exploit natural mineral water from 9th March 2001. More details about labelling are provided by the MTVO; here, the labelling also needs to meet the specifications of the EU regulation on the provision of food information to consumers ((EU) No. 1169/2011).

Are there requirements relating to the microbiological quality of mineral, spring and table water?
The microbiological quality of mineral, spring and table water is considered very good. In compliance with the very strict criteria that apply to official certification and the licence to exploit natural mineral water, steps must be taken to ensure that there are no pathogens or parasites at the source or where the product is marketed. It may only contain those revivable micro-organisms that do not indicate contamination during tapping or bottling. To check compliance with these criteria, microbiological examinations for specific indicator organisms (including Escherichia coli, coliforme germs, faecal streptococci and Pseudomonas aeruginosa) and for the total microbial content are stipulated. The same specifications apply for spring and table water.

Are there requirements relating to the microbiological quality of drinking water?
The microbiological and chemical requirements for drinking water are governed by the Drinking Water Act. The drinking water supply also defines that tap water may not contain any pathogens nor any other substances in concentrations that may be harmful to health; although the list of microbiological and chemical parameters that need to be checked is much longer than for mineral, spring and table water and e.g. pesticides. Regular inspections do not take place here at the ‘begin of the pipe’ but at the ‘end of the pipe’, i.e. before the tap water reaches the households. The respective technical norms (DIN, EN) for examining the drinking water for microbiological and chemical parameters are listed in the Regulation.

What can consumers do to maintain the microbiological quality of mineral, spring and table water, ad even self-bottled drinking water.
Generally, water does not offer good conditions for the growth of bacteria because there are no nutrients required for micro-organisms to grow. Microbiological examinations conducted in la-boratory conditions indicate that the pH-value, the temperature, the level of carbonic acid and the existence of organic material in beverages and also in mineral water impact on the growth of existing micro-organisms. Other studies compared the presence of micro-organisms in non-carbonated water to the level of micro-organisms in carbonated mineral water. Bacteria were detected more frequently in non-carbonated water. Also, the spring location and the storage period, but not the storage temperature have an impact. To maintain microbiological quality, mineral, spring and table water should be protected from contamination (especially after being opened), stored in a cool place and consumed as quickly as possible.

As it is possible to contaminate water with bacteria when drinking straight from the bottle, this should be avoided or the remaining water should be drunk by the same person or poured away.

How long can water be drunk from an opened bottle once it has been opened?
In general, the mineral, spring and table water should always be consumed directly after the bottles have been opened, in particular if the water is drunk directly from the bottle. Previously opened bottles should be closed and stored in a chilled place. These can still be consumed even after several days. This also applies to self-bottled drinking water, if the water is bottled hygienically. However, the freshness of the water, especially carbonated water, decreases over time. Carbonic acid can escape more easily from plastic bottles (polyethylene terephthalate (PET)) than from glass bottles, which is why the expiry date for water in PET bottles is usually shorter than for water in glass bottles. Water standing open at room temperature should not be drunk after several days.

How does the shelf life change, if the bottle stands in the fridge?
Most micro-organisms require temperatures higher than those inside a fridge to grow. Therefore, it is recommended keeping open bottles or packaging at fridge temperature.

Does it make a difference if I drink the water from a glass or directly from the bottle?
The mouth cavity of every person is populated by bacteria and yeasts. These so-called mouth flora have a protective function to prevent the penetration of pathogens. Also, there could be leftover food in the mouth. The water or the bottle can be contaminated by drinking straight from the bottle. Therefore, drinking straight from the bottle should be avoided or the bottle should be drunk as soon as possible and not shared with other persons.

Do the shelf lives of bottled mineral, spring and table water or tap water differ?
The shelf life depends on the hygienic quality that is tested, both of tap water and also bottled mineral, spring and table water. However, when bottling water into finished packs (e.g. glass or plastic bottles of drinks cartons), certain hygiene requirements are stipulated to ensure that neither the packaging itself nor the bottling process is contaminated. If comparable hygienic aspects, even for self-bottled tap water, are observed, and the water is sealed and cooled, this water can also be stored for some time. Also, steps must be taken to ensure regular thorough cleaning of the used water bottles, in particular if water is drink straight from the bottle, for ex-ample drink bottles used for sports.

Does it make a difference whether water is kept in a glass or plastic bottle?
Hygienic quality, i.e. the existence of pathogens that could impact on health, is not affected by the type of packaging. However, there are discussions about whether substances that could have a similar effect to hormones could pass from the plastic packaging into the water. This was triggered by studies that verified effects similar to oestrogen in snails and cell cultures that came into contact with mineral water. However, a comparison of mineral waters from PET bot-tles and water from glass bottles showed no difference with respect to the measured very low oestrogen activity. It is therefore unlikely that this low activity can be traced back to the PET bottles. Chemical analyses of mineral water have not yet verified any substances that could have caused oestrogen activity. Changes in taste or odour can however occur when acetaldehyde from PET bottles is transferred, because this substance can be tasted and smelt even in very small quantities. No impact on health is expected, even if acetaldehyde is tasted or smelt, because the quantity is usually well below the statutory tolerance. BfR has answered more FAQs about PET bottles at https://www.bfr.bund.de/en/selected_questions_and_answers_on_pet_bottles-60846.html.

About the BfR
The German Federal Institute for Risk Assessment (BfR) is a scientifically independent in-stitu-tion within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. The BfR advises the Federal Government and the States (‘Laender’) on questions of food, chemical and product safety. The BfR conducts its own research on topics that are closely linked to its assessment tasks.