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Headline: How often should you clean your water bottle?

The Bottom Line

How often should you clean your water bottle?

Higher concentrations of microbes are likely to be found at the mouth and cap areas of a water bottle due to their frequent contact with a person's mouth. PHOTO: ISTOCKPHOTO

These reusable containers are convenient, but can be a breeding ground for harmful bacteria

Amrita Kaur

Owning a reusable water bottle helps you stay hydrated as it is convenient to carry around. It also cuts down on single-use plastic. But how often do you need to wash it to make sure you are not gulping down possibly harmful bacteria as well?

On average, a reusable water bottle contains 20.8 million colony-forming units of bacteria, which is more than 40,000 times that of a toilet seat with 515 colony-forming units. Colony-forming units refer to the number of living microbes on a surface. Microbes are microscopic organisms that include bacteria, viruses and fungi.

Reusable bottles have also been found to be 14 times dirtier than pet bowls, as well as housing five times more bacteria than a computer mouse.

These findings are from a study by WaterFilterGuru.com, a water treatment resource in the United States, which looked at different types of bottles and measured the amount of bacteria on them.

There are certain parts of a bottle that microbes tend to lurk at, experts tell The Straits Times.

Associate Professor Adison Wong, from Singapore Institute of Technology's Food, Chemical and Biotechnology cluster, says higher concentrations of microbes are likely to be found at the mouth and cap areas of a water bottle due to their frequent contact with a person's mouth.

He says microbes have the ability to grow on nutrients present in our saliva, as well as in various beverage types, such as juice, soda and caffeinated drinks.

The microbes are usually transferred from a person's mouth to the water bottle, gradually building up slimy, sticky layers called biofilm around the mouth of the bottle.

This environment, he adds, protects the microbes and is harder to clean by simple rinsing.

Dr Ch'ng Jun Hong, a lecturer at National University of Singapore Yong Loo Lin School of Medicine's (NUS Medicine) Department of Microbiology and Immunology, says residual food particles and microbes could also contaminate the bottle if there is any backwash when drinking.

Backwash refers to liquid which makes its way from a person's mouth back into a drinking container.

"Our mouths are full of microbes and we are most likely to be the major source of contamination," says Dr Ch'ng.

The type of lid also has an impact on the accumulation of microbes.

According to the study by WaterFilterGuru.com, spout-top and screw-top lids contained the most bacteria of all the water bottles, with 30 million colony-forming units.

Screw-top bottles with threaded lids create moist crevices where bacteria can accumulate, as these areas are challenging to clean thoroughly, Prof Wong highlights.

He adds that squeeze-top bottle and straw-type lids minimise direct mouth contact, reducing the chances of bacterial transfer.

Dr Ch'ng says that, while bottles should still be scrubbed, nooks, crannies, grooves and scratches provide a safe haven for microbes to hide and are difficult to properly clean with a sponge and detergent.

"These are also the most likely places where gunk like saliva, skin cells, sebum and food residue will get trapped," he adds.

The material of the water bottle also affects the amount of microbes it holds and how likely it is to attract bacteria.

Mr Alvin Tan, managing director of cleaning company SureClean, says, for example, that stainless steel and glass are less conducive for bacteria growth.

Stainless steel is generally less porous and has a smooth surface compared with other materials, such as plastic.

These characteristics make it harder for bacteria to attach to and grow on the surface of stainless steel bottles, he says.

Stainless steel is also non-reactive and does not leach chemicals. As a result, it is less likely to attract bacteria, especially when kept clean and properly maintained, notes Mr Tan.

Glass is non-porous and has a smooth surface too, making it less likely to harbour bacteria than some types of plastic. Like stainless steel, it is also non-reactive and does not release chemicals or flavours into the contents of the bottle, he adds.

Bisphenol A-free (BPA-free) plastic bottles, on the other hand, are made from various types of plastic, some of which may have a more porous surface, allowing bacteria to attach and multiply more easily, highlights Mr Tan.

Small scratches or abrasions on the surface of the plastic can also provide crevices for bacteria to hide. Hence, they may require more frequent and careful cleaning to prevent the build-up of bacteria, he adds.

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The Bottom Line

Brush regularly to stop bacteria build-up

When washing your bottle, pay attention to the bottom, sides and the neck of the bottle, where residue and bacteria are more likely to accumulate. PHOTO: ISTOCKPHOTO

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But experts say there is no fixed duration of time one should keep their reusable plastic bottle.

Dr Ch'ng says the longer a bottle is kept, assuming one does thorough regular cleaning, the more likely it is to accumulate scratches on the inner surfaces of the bottle and harbour microbes.

While some BPA-free bottle manufacturers advertise a shelf life of 10 years for their products, Prof Wong suggests that a replacement every two years would be a good hygiene measure.

"Plastic weakens over time, especially when it is exposed to sunlight on a regular basis, and damaged surfaces such as microscopic scratches may favour the development of bacteria," he adds.

Regardless of the material, Mr Tan cautions that if a bottle is not cleaned regularly, bacteria can still build up on the surface and potentially contaminate the contents.

Most microbes do not cause health problems, but some may lead to gastrointestinal issues such as diarrhoea, stomach cramps or nausea, says Prof Wong.

People with weak immune systems or underlying health conditions may be more susceptible to the adverse effects of microbial contamination, he adds.

So, how often should you wash your bottle?

Ms Chan Chuu Ling, an instructor at NUS Medicine's Department of Microbiology and Immunology, says it depends on how you use your bottle and what you put in it.

For instance, if you fill it with juice or milk, it is best to finish it as soon as possible and wash the bottle immediately after that to limit the growth of microbes.

If you drink directly from the opening of the bottle, she suggests washing it daily.

"If your bottle smells funny, then you should definitely wash it as soon as you can," says Ms Chan.

"I don't wash the insides of my bottle daily because I put only water in the bottle and I pour the water into my mouth, rather than directly drinking from the opening of the bottle. This means I worry less about contaminating the bottle with cells, saliva and backwash," she says.

Prof Wong and Mr Tan, who recommend washing reusable bottles daily, says using a soft-bristle bottle brush or non-scratch sponge to scrub the interior of the bottle with soapy water, and thoroughly drying it between uses, can help maintain a clean and safe water container.

Ms Chan also advises taking apart the bottle as much as possible. For example, if there is a removable rubber ring or mouth parts, remove and wash the connecting area and the removable parts thoroughly.

Using hot water can also be helpful in sterilising the bottle, but make sure the material is heat resistant, she cautions.

THE BOTTOM LINE

Wash your reusable bottle daily, especially if your mouth has direct contact with the opening of the bottle. Remove all parts of the bottle if possible and scrub the bottle with a suitable brush using soapy water.
Hot water can be used if the material is heat resistant.

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• The Bottom Line is a series which aims to answer burning questions on health and well-being.

HOW TO CLEAN YOUR REUSABLE BOTTLE

Mr Alvin Tan, managing director of cleaning company SureClean, shares a step-by-step guide on how to thoroughly wash a reusable bottle.

1 Empty the bottle
Pour out any remaining liquid.

2 Disassemble
If your bottle has multiple parts, such as a removable cap, straw or lid, disassemble it to ensure you can clean each component separately.

3 Rinse with water
Rinse the entire bottle, including the cap and any disassembled parts, with water.

4 Add soap or cleaning solution
Apply a small amount of mild dish soap or a water bottle cleaning solution to the interior of the bottle.

5 Use a bottle brush
Insert a long-handled bottle brush into the bottle to scrub the interior thoroughly.
Pay attention to the bottom, sides and neck of the bottle, where residue and bacteria are more likely to accumulate.
Use a non-abrasive sponge or brush so as not to damage the surface of the bottle. Alternatively, use a toothbrush to reach the crevices.

6 Clean the cap and other parts
If your water bottle has a cap or other components, use the bottle brush or a smaller brush, such as a toothbrush, to clean them as well.
Scrub the threads and crevices to remove any bacteria or grime.

7 Rinse again
After scrubbing, thoroughly rinse the bottle, cap and any other parts with water to remove any soap or cleaning solution.

8 Sanitise
This step is optional, but for extra cleanliness, use a diluted solution of vinegar, or a mixture of water and baking soda, to sanitise the bottle.
Let the solution sit inside the bottle for a few minutes before rinsing it thoroughly.
Alternatively, if you have an ultraviolet steriliser at home, you can use it to dry and sanitise the bottle.

9 Air dry
After cleaning and rinsing, leave the bottle and its components in a well-ventilated area to air dry completely.
Make sure there is no moisture left inside the bottle, as it can encourage bacterial growth.

10 Reassemble the bottle
Once everything is dry, reassemble the water bottle if it has multiple parts.

11 Store it properly
Store the bottle in a clean and dry place, away from potential sources of contamination.
If your reusable bottle has specific cleaning instructions provided by the manufacturer, follow them to maintain the bottle's quality and longevity.