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# Distilled water a potential health risk

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**A**S A matter of national survival, Singapore pursues an “aggressive” water policy. Did you know, however, there is also a policy on “aggressive water”?

At a recent talk by an official from national water agency PUB, many were surprised at the speaker’s mention of “aggressive water”. This liquid does not snarl. It is simply water almost or completely bereft of dissolved minerals.

This low-mineral or totally unmineralised water actually dissolves and leaches out minerals like copper, lead and cadmium from metal pipes and other plumbing material, like gypsum. For this reason, only plastic pipes, hose lines, fittings, storage tanks and containers should be employed to move this water around.

Demineralised water is also called deionised water as most ions (electrically charged atoms) have been removed from it. These ions include those of table salt, (sodium and chloride), chalk (calcium and carbonate), gypsum (magnesium and sulfate) and ions of copper, iron and other metals as well.

The ions are removed by a process called reverse osmosis. It forces impure water through special membranes. Newater, which is almost as pure as distilled water, is made by this process.

Distillation, by contrast, involves boiling the water and condensing the steam. It removes not only ionic contaminants but also (non-ionic) organic impurities. Deionisation, however, cannot remove the latter – which includes microbes like viruses and bacteria. So deionised water may be chemically pure but not necessarily biologically pure. Thus home water

“purifiers” – which remove material from tap water that may not be pleasant to the taste buds – may give you a better tasting cuppa but not one that is biologically safer.

Now the \$64 million question is: If aggressive water attacks the plumbing, won’t bottled demineralised or distilled water be bad to drink? A 2004 World Health Organisation (WHO) review of the evidence began by noting that the potential health effects of drinking “totally unmineralised water had not generally been considered, since this water is not found in nature”.

However, there was some research carried out in the former Soviet Union which had produced demineralised drinking water for some cities in Central Asia. It was quickly recognised that if some minerals were not added back in, the water did not taste nice enough. Today, demineralised water is usually blended with more mineral-rich water (just as Newater is added to PUB water) to make it more palatable – and less aggressive.

WHO had also reported back in 1980 some experiments in which rats were given distilled water for a year. The animals drank more water than normal rats. They also excreted more sodium and chloride ions in their urine, so they became deficient in these elements.

In 1993, the German Society for Nutrition issued a public warning against drinking distilled water. The fear was that salts would be leached from the body, so its prolonged use may alter the body’s mineral and water metabolism. In 1994, the US Centres for Disease Control and Prevention (CDC) issued a public advisory asking parents not to use distilled or low-mineral water in preparing drinks for infants.

A problem that could develop with consumption of demineralised water had long been observed in some mountain climbers who melt snow to make their beverages. (Rain water and naturally formed ice have no minerals.) These individuals could develop swelling of the brain, throw a fit and go into shock.

In a 2000 study, people were found to have developed “water intoxication” after drinking several litres of low-mineral water following strenuous physical exertion. When too much such water is ingested, the body’s electrolyte balance between different body compartments is altered, which upsets

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**Often, some minerals are added back into bottled water purified by reverse**

*osmosis to improve its taste and reduce its aggressiveness – but not for health reasons. Thus not all minerals found in natural water are put back in. Frequently, it is just calcium carbonate (chalk) or other carbonates that are added, not magnesium.*

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