

It has taken twelve years for a study to emerge that confirms our theory that the standing time of water allows for its “stagnation” and the ability to dissolve lead and copper from pipes.

<https://phys.org/news/2018-01-metals-pipes-dissolve.html>

Metals in taps and water pipes can dissolve into drinking water

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Significant amounts of nickel, lead and copper can dissolve into the water from the water pipes and taps in buildings. This was revealed in the master's thesis of Meri Sipilä, who graduated recently from Aalto University. Tap water samples were taken from 30 buildings in different parts of Finland in her study.

The research showed that the metal concentrations in tap water were higher if the water had been stagnant in the pipes for longer. In addition to the stagnant time, metal concentrations in tap water were also affected by the age of the tap and pipes and by the materials used in them.

"Nickel dissolved into the water the most in buildings where new taps had been installed less than a year earlier, while the highest copper levels were present where the copper pipes were less than a year old. The nickel had probably leached from the tap's nickel-chrome coating. Lead, on the other hand, can be released from brass sections, such as taps and fittings," Ms Sipilä explains.

For health reasons, Finnish law sets the maximum concentration of nickel in drinking water at 20 µg/l. This level was exceeded in the one-litre water samples in a third of the test locations when the water had been stagnant for longer than 8 hours. The nickel concentrations varied between 21 and 80 µg/l in the non compliant water samples. Ms Sipilä stresses, however, that the nickel concentrations dropped immediately once the stagnant water was flushed.

With shorter stagnant times, the maximum level for nickel was exceeded only in one location. For lead, the health-based requirement of 10 µg/l was exceeded in stagnant water in one location and was close to the limit in several others. Concentrations of copper were elevated in several locations, but the maximum level was not exceeded in any of them.

"Water used for drinking or cooking should be run from the tap until the cold water temperature is steady. In this way, the water that has been stagnant in the building's water system is removed and the metal concentrations are definitely reduced to safe levels," Ms Sipilä advises.

Important note for domestic water installations

The changes made to the EU's Drinking Water Directive require that levels of copper, lead and nickel in cold tap water is measured from now on without prior flushing. Earlier on, all tap water samples were taken after extensive flushing in Finland, so the samples corresponded to the water delivered by the water utility. In this new research as well, the concentrations of nickel, lead and copper in the water utility's water were easily within the health based quality requirements set by law for drinking water.

The purpose of the new sampling method is to reveal the possible quality-reducing effect of a property's water installations and pipes. If maximum metal concentration levels are exceeded in tap water, further studies are conducted to figure out whether this is due to the property's water system or the water delivered by the water utility. Once the reason for non compliance is established, the health protection authorities can require the relevant party to correct the situation.

Officials in charge of health protection monitoring in Finland also recommend running the tap water before using the water for drinking or cooking.

Explore further: Replacing some old pipes can still result in lead-contaminated water

More information: WHO Nickel in Drinking-water: www.who.int/water_sanitation_h..._ision/nickel2005.pdf

Provided by: Aalto University

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