
Abstract

Freshwater quality: It's not only the cows you need to watch

Swimming baths a third of the size of an Olympic pool contain around 75 litres of pee – or the volume of a small wheelie bin – according to Canadian researchers. Aside from being more than a bit gross, piddle in pools can react with chlorine and cause eye irritation and breathing problems, say the authors, L K Jmaiff Blackstock and colleagues from the Faculty of Medicine and Dentistry, University of Alberta, Canada.

More seriously ...

Sweetened swimming pools and hot tubs

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Nitrogenous organics in urine can react with chlorine in swimming pools to form volatile and irritating NCl-amines. A urinary marker is desirable for the control of pool water quality. The widespread consumption of acesulfame-K (ACE), a stable synthetic sweetener, and its complete excretion in urine, makes it an ideal urinary marker. Here we report the occurrence of ACE and its potential application in swimming pools and hot tubs. First, we developed a new method for achieving high-throughput analysis of ACE without preconcentration or large-volume injection. Analysis of more than 250 samples from 31 pools and tubs from two Canadian cities showed ACE in all samples. Concentrations ranged from 30 to 7110 ng/L, up to 570-fold greater than in the input tap water. The level of dissolved organic carbon was significantly greater in all pools and tubs than in the input water. Finally, we determined the levels of ACE over 3 weeks in two pools (110,000 and 220,000 U.S. gallons) and used the average ACE level to estimate the urine contribution as 30 and 75 litres. This study clearly shows the human impact in pools and tubs. This work is useful for future studies of the human contribution to formation of disinfection byproducts (DBPs), epidemiological assessment of exposure, and adverse health effects in recreational facilities.

Environmental Science and Technology Letters 2017, 4: 149–153.

Read more at: <http://pubs.acs.org/doi/pdf/10.1021/acs.estlett.7b00043>

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