



WEB OF SCIENCE

WATER CHARACTERISTICS AND FOOD COMPLEMENTARITIES

BULATA Gabriela¹, MUNTEANU Constantin^{1,2,3,4}

Editor: Constantin MUNTEANU, E-mail: office@bioclima.ro



Balneo and PRM Research Journal

DOI: <http://dx.doi.org/10.12680/balneo.2021.452>

Vol.12, No.3 September 2021

p: L71

Corresponding author: Constantin Munteanu, E-mail: constantin2378@yahoo.com.

1. FNDA - Federația Națională a Degustătorilor Autorizați, Bucharest, Romania
2. Romanian Association of Balneology, Bucharest, Romania
3. Teaching Emergency Hospital "Bagdasar-Arseni", Bucharest, Romania
4. Faculty of Medical Bioengineering, University of Medicine and Pharmacy "Grigore T. Popa", Iași, Romania

Abstract

Introduction. There are different categories of waters intended for human consumption such as natural mineral waters and spring waters. Natural mineral waters may be distinguished from ordinary drinking water by their purity at source and their constant level of minerals. Spring waters are intended for human consumption in their natural state and are bottled at source. This document identifies knowledge gaps and recommends research priorities in order to build an evidence base to inform decisions on managing "processed" drinking-water. This is important because of increasing consumption of water arising from advanced treatment processes such as desalination and uncertainty about the resulting health implications. The World Health Organization (WHO) assembled a diverse group of nutrition, medical, epidemiological and other scientific experts and water technologists at the Pan American Health Organization in Washington, DC, USA, on 27–28 April 2006 to address the possible role of drinking-water containing calcium and/or magnesium as a contribution to the daily intake of those minerals. The overarching issue addressed was whether consumption of drinking-water containing a relatively small contribution to total daily dietary intake of calcium and/or magnesium would provide positive health benefits, especially with respect to cardiovascular disease mortality (the so-called "hard water cardiovascular disease benefits hypothesis"), in the population, particularly in people whose dietary intake was deficient in either of those nutrients.

Results and discussion. Because of growing concern that constituents of drinking water may have adverse health effects, consumption of tap water in North America has decreased and consumption of bottled water has increased. Our objectives were to 1) determine whether North American tap water contains clinically important levels of calcium (Ca^{2+}), magnesium (Mg^{2+}), and sodium (Na^+) and 2) determine whether differences in mineral content of tap water and commercially available bottled waters are clinically important. Compared to the old RDAs, the new DRIs incorporate the concept of preventing nutrient deficiencies as well as risk reduction for chronic conditions such as heart disease, diabetes, hypertension, and osteoporosis. In our analyses, we compared mineral levels in tap and bottled waters to DRIs in order to examine the clinical significance of mineral intake from drinking water. Dietary reference intakes of Mg^{2+} are generally higher for males than for females but also depend on age. A 30-g serving of almonds or half a cup of spinach contain approximately 80 mg of Mg^{2+} , and one third of a cup of bran cereal contains approximately 50 mg. Currently established DRIs do not yet include estimates for Na^+ . Previously established RDA estimates, however, indicate that healthy adults require at least 500 mg of Na^+ per day, and nutritional experts have set a maximum recommended intake of 2,400 to 3,000 mg of Na^+ per day. Published data on water consumption are limited, and the few available studies have reported an important variability in tap water intakes in North America. The amount of water consumed daily varies from individual to individual and largely depends on other sources of fluids. Nutritional experts have recommended that consumption of 30 ml/kg/day of water is sufficient for the elderly and that a provision of 150 ml/kg/day is recommended for infants.

Conclusions. Drinking water sources available to North Americans may contain high levels of Ca^{2+} , Mg^{2+} , and Na^+ and may provide clinically important portions of the recommended dietary intake of these minerals. Physicians should encourage patients to check the mineral content of their drinking water, whether tap or bottled, and choose water most appropriate for their needs.

Keywords: *mineral water; sensory analysis; consumer preference; mineral nutrients*