

Copper in infant nutrition: Safety of World Health Organization provisional guideline value for copper content of drinking water

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Background: Copper is an essential nutrient for humans. Recently, a limit of 31.48 $\mu\text{mol/l}$ (2 mg/l) was proposed by the World Health Organization as the provisional guideline value for copper content of drinking water. The objective of the study was to determine the tolerance of chronic exposure to drinking water with low or high copper content in infants. Methods: Healthy infants (n = 128) were randomly assigned to receive drinking water with less than 1.57 $\mu\text{mol/l}$ (<0.1 mg/l) (n = 48) or 31.48 $\mu\text{mol/l}$ (2 mg/l) of copper (n = 80) from 3 to 12 months of age. At 6, 9, and 12 months of age, serum concentrations of copper, ceruloplasmin, and superoxide dismutase; erythrocyte metallothionein; bilirubin; transaminases; and γ -glutamyl transferase were measured. Results: Small differences in biochemical indexes of copper nutrition were observed between the groups, but there was no evidence of adverse or toxic effects. These findings may be explained by an adaptive response to the higher copper in