

American Journal of Clinical Nutrition, 2003 Apr;77(4):891-8.

Randomized Efficacy Trial of a Micronutrient-Fortified Beverage in Primary School Children in Tanzania

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PMID: 12663288

DOI: [10.1093/ajcn/77.4.891](https://doi.org/10.1093/ajcn/77.4.891)

Abstract

Background: Dietary supplements providing physiologic amounts of several micronutrients simultaneously have not been thoroughly tested for combating micronutrient deficiencies.

Objective: We determined whether a beverage fortified with 10 micronutrients at physiologic doses influenced the iron and vitamin A status and growth of rural children (aged 6-11 y) attending primary schools.

Design: In this randomized, double-blind, placebo-controlled efficacy trial, children were assigned to receive the fortified beverage or an unfortified beverage at school for 6 mo.

Results: There were nonsignificant differences at baseline between children in the fortified and nonfortified groups in iron status, serum retinol, and anthropometry. At the 6-mo follow-up, among children with anemia (hemoglobin < 110 g/L), there was a significantly larger increase in hemoglobin concentration in the fortified group than in the nonfortified group (9.2 and 0.2 g/L, respectively). Of those who were anemic at baseline, 69.4% in the nonfortified group and 55.1% in the fortified group remained anemic at follow-up (RR: 0.79), a cure rate of 21%. The prevalence of children with low serum retinol concentrations (< 200 microg/L) dropped significantly from 21.4% to 11.3% in the fortified group compared with a nonsignificant change (20.6% to 19.7%) in the nonfortified group. At follow-up, mean incremental changes in weight (1.79 compared with 1.24 kg), height (3.2 compared with 2.6 cm), and BMI (0.88 compared with 0.53) were significantly higher in the fortified group than in the nonfortified group.

Conclusion: The fortified beverage significantly improved hematologic and anthropometric measurements and significantly lowered the overall prevalence of anemia and vitamin A deficiency.