

Micronutrient adequacy in diets consumed by school children from farming communities of Tanzania

Victoria Gowe^{1, 2}, Joyce Kinabo¹, Theresia Jumbe¹, Nyamizi Bundala¹, Laila Eleraky², Hadija Mbwana¹, Constance Rybak³, Stefan Sieber³, Khamaldin Daud Mutabazi⁴, Wolfgang Stuetz²

¹Food Technology, Nutrition and Consumer Sciences, Sokoine University of Agriculture, Tanzania

²Institute of Biological Chemistry and Nutrition, University of Hohenheim, Germany

³Leibniz Centre for Agricultural Landscape Research (ZALF), Inst. of Socio-Economics, Germany

⁴School of Agric. Economics & Business Studies, Sokoine University of Agriculture, Tanzania

Abstract

Background: School children are vulnerable to micronutrient deficiencies. Micronutrient deficiencies during this period may lead to retarded growth, poor cognitive development, anaemia and increased risk of infections. This study aimed to assess the adequacy of zinc, iron and vitamin A, in diets consumed by school children aged 5-10 years in Chamwino and Kilosa districts, Tanzania.

Methodology: In a cross-sectional study, 666 children aged 5-10 years were randomly recruited. Dietary assessment was conducted using a quantified 24 hours recall and a food frequency questionnaire. Nutri-survey software was used for analysis of nutrient intake. Serum levels of zinc, iron and vitamin A were determined using enzyme-linked immunosorbent assay and spectrophotometric methods. Household Dietary Diversity Score (HDDS) was also derived. Data are presented as means (SD) and prevalences and compared using ANOVA, and chi-squared test.

Results: The median caloric intake was 898 Kcal, 81% of the children in the study did not meet the Recommended Daily Intake (RDI) for energy. The median dietary intake of iron was 11.5 mg/day and was inadequate for 26% of the children. The median dietary intake of zinc was 4.9 mg/day with 95% of the children not meeting the RDI. The median dietary intake of vitamin A was 320 µgRE/day and was inadequate for over 62% of the children. The prevalence of anaemia, low vitamin A status and zinc deficiency among study children was 42.9%, 65.4% and 32.8% respectively. Iron deficiency prevalence was 27.8%. Anaemia, low vitamin A status and zinc deficiency, which may be partly linked to the poor dietary intake was prevalent among children in the study area. The overall mean HDDS was 4.8 ±1.8. The least consumed food groups in both districts were eggs, milk products and meat/organ.

Conclusion: The consumed diets had limited diversification coupled with inadequate intake of iron, zinc and vitamin A, leading to poor micronutrient status. This study recommends consumption of pro vitamin A rich vegetables/fruits and animal based foods in order to improve children's micronutrient status in the study villages.

The financial support of Scale-N project by the German Federal Ministry of Food and Agriculture (BMEL) is highly acknowledged.

Key words: School children, Dietary intake, Vitamin A, Zinc, Iron