

Optimizing Traditional Home Processing Technologies to Increase Nutrient Bioavailability of Complementary Foods in Rural Tanzania

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Abstract

Plant based foods are the major staples of diets in developing countries including Tanzania. These foods contain high levels of phytates and polyphenols the potent inhibitors of iron bioavailability. Frequent intake of these foods exposes children to the risk of developing iron deficiency anemia. The overall objective of the study was to determine the effects of soaking and germination on iron bioavailability in maize used for complementary feeding in Iringa district. The specific objectives were to: i) develop the parameters for soaking and germination; and measure the proximate and fiber contents of maize used for complementary feeding; ii) measure the phytate, polyphenol and iron contents of the soaked and germinated maize and iii) develop porridge formulations using the soaked and germinated maize; and assess their acceptability by mother-infant (6-12 months of age) pairs. A cross-sectional study design was employed. Maize grains were soaked in distilled water for 24 hours, drained and germinated at 36, 48 and 72 hours then dried and milled to obtain flour. Four formulations (porridges) were made and fed to 40 (mother-infant (6-12 months of age) pairs. Acceptability of the formulated diet was measured using the 9-point Hedonic scale. For all measures, statistical analysis employed Duncan multiple range test and one way ANOVA model applying Fisher's LSD test to determine difference among means. Results of proximate composition showed a significant increase ($P < 0.05$) in ash, fiber and carbohydrates at 72h, but a significant decrease observed in proteins and fats. Phytates decreased significantly ($P < 0.05$) with germination time. Polyphenols and iron increased significantly ($P < 0.05$) at 72 h. The Hedonic scale ratings ranged from 5 to 9, indicating that all porridges were moderately well-liked by participants (mothers and infants).