

Content of iron and vitamin A in participatory improved complementary dishes for children in Central Uganda

Background: In many Ugandan households' complementary foods are starchy staple-based meals that often lack micronutrient such as vitamin A and iron needed for adequate growth and development. Participatory improvement of complementary foods using locally accessible ingredients is an effective intervention to improve child growth. An earlier cross-sectional study, followed by in-depth interviews and observations with selected households and laboratory analysis established that the common complementary foods for children 6-24months in Uganda are either based on maize or cooking banana. The common maize-based porridges had no trace of either vitamin A or iron while the banana-based dishes indicated no negligible levels of iron and very low levels of vitamin A (23-43 RAE ug/100gep). Considering the estimated average requirements of iron and vitamin A for children 1-3yrs being 5mg/day and 275 RAE ug/day respectively, these foods are poor sources of these nutrients in their current form.

Methods: Based on vitamin A and iron gaps in the common dishes, a recipe modification model for five dishes was developed using community participatory methods. This involved interactive community meetings with farmer-households in Kiboga district, Uganda. The participants identified local ingredients such as Orange Fleshed Sweet Potatoes (OFSP), vitamin A-rich banana ('Biira variety') and green leafy amaranth for possible inclusion in the recipes. Through several recipe trials, tasting using mother-child pairs and expert consultations, 5 recipes were arrived at for further testing. Raw ingredients of the respective recipes were obtained from local markets and farms and transported as hand luggage to Universität für Bodenkultur (BOKU), Austria within 48hrs. At the laboratory, the meals were prepared using community validated procedures within 24hrs of ingredients arrival. A portion of each sample (20-40 g) was frozen at -24°C for 6 hours and then freeze-dried for 24 hours. Dry matter was determined, and the samples homogenized using the Osterizer, and stored at -24°C until analysis (not more than 14days). The standard method microwave digestion and the Flame Atomic Absorption Spectroscopy (FAAS) method were performed for determining the content of iron. Since the diets were mostly plant-based, vitamin A was measured in form of provitamin A carotenoids (pVACs) using HPLC analysis. Each analysis was carried out in triplicate.

Findings: In banana-based dishes where ingredients such as groundnut paste, soy flour and silver fish were present, iron content increased 10-fold. There was no significant improvement in vitamin A level in the improved banana-based dishes. The Vitamin A content in the improved porridge recipes was significant, from no trace to between 20 and 40 RAE/100gep while the iron also improved significantly to levels of between 4-5.8g/100gep.

Conclusion: Using local available foods, has been emphasized in the WHO/UNICEF global strategy for infant and young child feeding as one of the important strategy for addressing poor nutrient intake. CONTINUES in DOC!

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