Enhancing the nutritional quality of amaranth vegetable through specific food preparation methods

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Abstract
Food preparation methods applied to African traditional vegetables varies greatly depending on preferences of various consumers. Amaranth is one of the most preferred vegetable, with high nutritional quality, especially high iron content. The bioaccessibility of iron is however low since it is non-heme, and also in most cases reduced due to the presence of anti-nutrients such as oxalate. This study aimed to evaluate the nutrient retention of amaranth vegetable dishes prepared using selected Kenyan traditional recipes, and also to enhance the iron bioavailability of amaranth dishes using food preparation methods. Nutrient retentions of amaranth prepared by three common food methods were analyzed. In-vitro iron bioavailability of amaranth dishes with and without bioavailability enhancers as well as an amaranth meal including a common staple food_ *"ugali"* was also studied. The nutrient retentions of the various dishes used in this study was fairly high with at least 85% retention of minerals and an increase of up to 45% in three carotenoids. It can be concluded that incorporating vitamin C, adding an iron rich vegetable and boiling of the vegetable significantly improves the iron bioavailability and hence improves the iron uptake by the body. Incorporating lemon juice enhanced dialyzable iron of the selected recipe by up to 66%. There was also no significant ($P \leq 0.05$) effect by the amaranth components on the iron bioavailability of "*ugali*". These methods could therefore be incorporated into household recipes to increase micronutrient intakes.

Keywords: micronutrient malnutrition, bioaccessibility, anti-nutrients, ingredients