

## **Sun-dried cowpeas and amaranth leaves recipe improves $\beta$ -carotene and retinol levels in serum and hemoglobin concentration among preschool children**

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Purpose Vitamin A deficiency (VAD) and anemia are major challenges among children and expecting and lactating mothers in developing countries. Intervention with locally available dark green leafy vegetables (DGLV) is more sustainable to eradicate VAD, being cost-effective and readily adaptable to local communities. DGLV contain high levels of iron and  $\beta$ -carotene (BC) and therefore useful in fighting VAD and anemia. Since DGLVs are season-dependent sun-drying enables their availability during low seasons. However, their contribution to the bioavailability of BC and the improvement of hemoglobin are not well understood. The study therefore investigated the effect of consuming cooked recipe consisting of sun-dried amaranth and cowpea leaves on the levels of BC, retinol, and hemoglobin in preschool children from Machakos District, a semiarid region in Kenya. Methods Vegetables were purchased from local vegetable market, with some sun-dried in an open shade. Levels of BC and retinol in serum and BC in fresh and processed vegetables were determined by a HPLC method and hemoglobin using a portable Hemocue Analyzer. Results All-trans-BC levels in uncooked fresh cowpea and amaranth leaves were 806.0  $\mu\text{g/g}$  and 599.0  $\mu\text{g/g}$  dry matter, respectively, while the dehydration and cooking processes retained the  $\beta$ -carotene levels at over 60 %. Consumption of the dehydrated vegetables significantly improved both serum BC and retinol levels ( $p < 0.05$ ), while the baseline hemoglobin levels improved by 4.6 %. Conclusion The study has shown that intervention with locally available sun-dried vegetables improves the bioavailability of BC, retinol, and hemoglobin levels among preschool children.