

MAKERERE  **UNIVERSITY**

**SELECTED PHYSICO-CHEMICAL PROPERTIES OF
TRADITIONALLY PROCESSED ORANGE-FLESHED SWEET
POTATO (*Ipomea batatus*, L. Lam)**

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DECLARATION

I Bamwirire David, declare that this is my original work and that it has not been presented for any award in any University.

Date:

Signature

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This thesis has been submitted for examination with our approval as supervisors.

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Abstract

The objective of the study was to determine the effect of traditional preparation and processing techniques on selected physico-chemical properties of two orange-fleshed sweet potato (OFSP) varieties. Proximate composition, colour parameters (L^* , a^* and b^*), texture and pro-vitamin A carotenoids were determined. Colour parameters, pro-vitamin A carotenoid content and texture were determined using a colorimeter, spectrophotometer and a rheometer respectively. Significant differences ($p < 0.05$) within the two OFSP varieties and between two districts for both physico-chemicals and pro-vitamin A carotenoid contents were noted. The carotenoid contents ranged from 26-31 mg/100 g (Ejumula) and 12-19 mg/100 g (SPK 004) respectively. Highest pro-vitamin A carotenoid contents were found in Ejumula and SPK 004 from Soroti. Although substantial losses ($p < 0.05$) of the carotenoids occurred during processing (8 – 39%), high carotenoid retention levels ($p < 0.05$) in boiled (66 – 92 %) and steamed (60 – 84 %) *Ejumula* and *SPK 004* samples respectively, were registered. Higher carotenoid retention occurred in steamed (60 – 84 %) and boiled (79 – 92 %) OFSP samples from *Luwero* compared to those from *Soroti* (61 – 84 %) respectively. Sun-drying reduced ($p < 0.05$) the pro-vitamin A carotenoids of OFSP in both locations. Generally, hunter values weakly and negatively correlated with pro-vitamin A carotenoids ($r = -0.2, -0.2, 0.1; p = 0.05$) for the degree of lightness and redness while a very weak positive correlation ($r = 0.1; p = 0.05$) was observed for the degree of yellowness in the raw samples. The L^* colour parameter (lightness) had a moderately weaker positive correlation ($r = 0.4$) with pro-vitamin A carotenoid content in the cooked samples. Despite the high pro-vitamin A carotenoid losses (up to 39 %), the boiled and steamed OFSP products from *ejumula* could adequately provide the recommended daily vitamin A amounts mainly for children less than six years. But the sun-dried-based products in both varieties may not sufficiently provide this RDA for vitamin A for this age group. These findings are vital for various stakeholders for maximum exploitation of the potential for OFSP and other food stuffs to provide sufficiently the nutrients needed by various age groups.