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## Effect of Formulation on Physicochemical and Sensory Properties of African Nightshade Leafy Sauces

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### Abstract

Postharvest loss of African leafy vegetables accounts for up to 50 % of the produced vegetables in Tanzania. The reasons for high postharvest loss include field heat, poor transportation and handling facilities, and lack of knowledge on how to preserve surplus leafy vegetables. As a result, there is low vegetable consumption during the offseason. Therefore, four green sauces were formulated from African nightshade with varied ratios of tomato (6 % and 12 %), carrot (0 %, 6 %, and 12 %), and baobab powder (0 % and 6 %). Moreover, peanut paste, and spices were added in the same proportions and the sauces were cooked at  $87\pm 3$  °C for 20 and 30 minutes. The sauces were assessed in Morogoro region, Tanzania for total soluble solids (TSS), pH, viscosity, and sensory properties using quantitative descriptive analysis (QDA). The panel for the QDA were also used to rate the total liking of each formulation in order to select the best two formulations for the consumer acceptance test. The consumer acceptance test was conducted using a hedonic scale. The results shown that TSS and pH of the fresh and cooked sauces ranged from 6 to 17, and from 3.8 to 5.0, respectively. Generally, formulations had significant effect on TSS, pH, viscosity and sensory descriptors of the sauces, while cooking time had less effects. The QDA scores show a positive correlation between sourness and pH, mouthfeel and viscosity of the sauces. Moreover, QDA scores shown that an increased level of carrots resulted in increased roughness (mouthfeel) and colour intensity, whereas sourness and total liking scores were decreased., The consumer acceptance test showed high acceptability of all sauces in terms of colour, smell, consistency, mouthfeel, sourness, and total liking. The addition of the baobab powder and increased tomato content had a positive effect on the acceptance of the African nightshade sauces. Therefore, the production of sauces from African nightshade leaves with particular ingredients has the potential to reduce postharvest loss, increase food security, as well as creating market opportunity to increase household incomes for both rural and urban communities in Tanzania.

**Keywords:** African nightshade, sauces, sensory properties, viscosity