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“Filling gaps and removing traps
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Effect of Pretreatment and Integration of Superabsorbent Polymers (SAP) as Desiccants on Quality Parameters of Frafra Potato (*Solenostemon rotundifolius*) during Solar Drying

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Abstract

Frafra potato (*Solenostemon rotundifolius*) is one of the underutilised and highly perishable food crops in Ghana. Being rich in starch and various bioactive compounds, it offers a dual-functionality. The study was undertaken to obtain *Solenostemon* flour that can be utilised as an ingredient for food processing in Ghana and Africa at large. Specifically, the aim of this study is to evaluate the effect of various pretreatments viz. blanching, sodium metabisulphite (5% w/v) and control on quality attributes of *Solenostemon* flour during forced convection solar drying. Additionally, as solar drying is only satisfactory so long as the sun is shining, this study also investigated the effect of incorporation of SAP as a desiccant on continuous drying of *Solenostemon* at night-time. Towards these objectives, fresh *Solenostemon* (6 mm slice thickness) was subjected to each pretreatment method and then solar dried under two test conditions: without SAP and with incorporation of SAP at sunset till 6:00 am the following day. During the drying process, ambient weather conditions as well as parameters of the drying air and moisture loss were monitored. Additionally, the final moisture content, water activity and some nutritional attributes for each pretreatment and test condition were evaluated and compared. Results showed that the control was averagely superior except for iron and vitamin C, and β -carotene content of the flour where blanching and SMBS were higher, respectively. Incorporation of SAP at night-time reduced the drying time by 11%, 12% and 19% respectively for blanching, sodium metabisulphite and control as compared to drying without SAP, with a significant effect ($P=706; 0.05$) on the water activity, iron, vitamin C, total phenols of the dried product except on colour ($P=707; 0.05$). Pretreatment with integration of SAP had a synergistic effect ($P=706; 0.05$) on most of parameters measured. From this study, it can be hypothesised, pretreatment of *Solenostemon* tubers may not be necessary before solar drying except when iron, vitamin C and β -carotene are of key interest. Also, SAP as a desiccant could successfully be incorporated in solar dryers for air dehumidification in order to ensure continuous night drying of products.

Keywords: Frafra potato, pretreatment, quality attributes, solar drying, super absorbent polymer