Processing methods affect phytochemical contents in products prepared from orange-fleshed sweetpotato leaves and rootsGeorge Ooko Abong'1,2 | Tawanda Muzhingi3 | Michael Wandayi Okoth1 | Fredrick Ng'ang'a2 | Phillis Emelda Ochieng2 | Daniel Mahuga Mbogo3 | Derick Malavi3 | Machael Akhwale4 | Sita Ghimire2

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Abstract

Phytochemicals enhance human health by acting antagonistically on incidences of cancer and other chronic diseases. They are considered indispensable in a variety of nutraceutical, pharmaceuticals, and medicinal and cosmetic applications. This study evaluated the effects of common processing methods on inherent phytochemical content in the roots and leaves of orange-fleshed sweetpotato (OFSP) varieties called Kabode and SPK031. Yellosp and Whitesp, which are local sweetpotato varieties, were also included as check for roots and leaves, respectively. The sweetpotato products prepared for phytochemical analysis were boiling roots and leaves, fry-ing chips and crisps, baking bread (for roots only), and fermenting and dehydrating leaves. Phytochemicals that were assessed included vitamin C, total phenolics and flavonoids, tannins, phytates, and soluble oxalates. Results indicated that retention of vitamin C was highest in boiled roots (85%–95%), followed by fries (71%–94%) and crisps (44%–76%), whereas the least retention was in bread (4%–11%) and leaves (0%–27%). Total phenolics, flavonoids, and antioxidant activity in leaves significantly (p < .05) varied with the type of processing. Higher retention of these phytochemi-cals was observed in processed roots but was lowest in bread. Boiling retained more than 100% of all carotenoids, while fermenting and drying the leaves retained 58–62 and 22%–48%, respectively. Frying retained more than 100% of the β-carotene in the roots, while boiling retained 96%–100%. All processing methods significantly (p < .05) reduced antinutrients in leaves and roots. Fermentation of leaves had higher reduction of oxalates, tannins, and phytates, while boiling had the least effect. It is concluded that traditional boiling enhances phytochemical retention in roots but de-grades most of them in leaves.KEYWORDSdehydration, fermented dehydrated leaves, phytochemicals, processing methods, retention

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