

Physicochemical and Functional Properties of Pseudostem Flour Obtained from Banana (*Musa acuminata L.*) Seeni Variety and Its Application as a Cookie

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Banana is a widely cultivated food crop in Sri Lanka and its pseudo-stem is a waste product which is rich in dietary fibre and minerals along with great therapeutic value. This study aimed to investigate the physicochemical and functional properties of banana pseudo-stem flour (BPF) of 'Seeni' variety and utilize the BPF as a functional ingredient to substitute commercial wheat flour (CWF) in cookie preparation. The techno-functional (water and oil absorption capacity, swelling power, solubility, foaming capacity, gelatinization properties, emulsion stability etc.) and physicochemical (pH, titratable acidity, water activity, color value, TSS etc.) properties that were determined in BPF were significantly ($p < 0.05$) varied from CWF. The DPPH radical scavenging activity of BPF was reported as $67.65 \pm 1.42 \mu\text{g/mL}$. The proximate analysis of BPF showed significantly higher values of ash and fiber ($11.33 \pm 0.18\%$ and $13.59 \pm 1.12\%$) compared with CWF ($0.38 \pm 0.18\%$ and $0.45 \pm 0.10\%$). The CWF was substituted with the levels of 50%, 60%, 70% and 100% (w/w) BPF to prepare cookies. From the sensory evaluation (5-point hedonic test, 30 untrained panelists), cookies formulated with 60% (w/w) BPF were selected as the most preferred sample. The cookies were also evaluated for properties including water activity, pH, antioxidant activity, color values, textural properties, physical parameters and proximate composition. The shelf-life was determined only for one month period and the changes of water activity, pH, peroxide value and microbial counts were complied with the acceptable limits. When increasing the BPF substitution percentage in cookies significantly ($p < 0.05$) increased the crude fiber, ash and protein contents. The study revealed the potential of using BPF as a commercial wheat flour substitute to produce cookies with better nutritional quality and good consumer acceptability.

Keywords: Seeni Banana Pseudo-Stem Flour, Commercial Wheat Flour, Cookie, Techno-Functional Properties, Physicochemical Properties