Characterization of Nutritional Composition, Functional Attributes and Glycemic Index in Three Commercially Available Breads: White, Finger Millet and Multigrain

T.M.P.M. Tennakoon[1], G.M. Somaratne[1]*, M.R.M.P. Jayawardhane[2], S.A.D.A. Dilrukshi[2], H.T.H. Dayarathna[1], B.D.R. Prasantha[1]

[1]*Faculty of Agriculture, University of Peradeniya, Peradeniya,20400, Sri Lanka*
[2]*AB Mauri Lanka (PVT) LTD, 124, Templers Road, Mount Lavinia, Sri Lanka*
**gsomaratne@agri.pdn.ac.lk*

Bread is a staple in many human diets and currently, new formulations are gaining popularity due to the health-conscious nature of the consumers. This study investigated the nutritional composition, glycemic index (GI) and functional properties of three commercially available bread types: white, finger millet and multigrain bread. Standard AOAC methods were employed to analyze the nutritional composition of breads. Total phenolic content (TPC) and antioxidant activity were assessed using the Folin–Ciocalteu reagent method and 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay. Eighteen non-diabetic healthy individuals with a BMI of 21.2 ± 1.7 kg/m^2 participated in GI studies after a 10-12 hour fasting period. The studies were conducted utilizing the ISO 26642:2010 method, measuring the blood sugar response over two hours from the point of consumption of bread samples containing 50g of available carbohydrates. As per the results, three breads differed significantly ($P < 0.05$) in terms of certain nutritional properties. White bread showed the lowest moisture (29.10 ± 0.14%), fat (2.40 ± 0.14%) and ash content (1.30 ± 0.14%) along with the highest protein content (8.10 ± 0.14%). Conversely, finger millet bread and multigrain bread contained 7.20 ± 0.14% and 5.40 ± 0.00% protein and 3.20 ± 0.14% and 4.80 ± 0.14% fat, respectively. Dietary fiber content was not significantly different ($P > 0.05$) between multigrain bread (3.40 ± 0.14%) and finger millet bread (3.10 ± 0.14%); however, both were significantly higher ($P < 0.05$) than that of white bread (2.10 ± 0.14%). The antioxidant activities were 0.13 ± 0.04%, 10.09 ± 0.10% and 7.76 ± 0.46% for white, finger millet and multigrain bread in that order. The TPC was 3.05 ± 0.39mg GAE/g for white bread, 3.53 ± 0.05mg GAE/g for finger millet bread and 4.41 ± 0.00mg GAE/g for multigrain bread, indicating that it was significantly higher ($P < 0.05$) in multigrain bread. The GI for white, finger millet and multigrain bread were 63.93 ± 8.14, 53.50 ± 4.81 and 45.78 ± 4.14, respectively. In conclusion, finger millet and multigrain bread were classified as low-GI bread compared to medium-GI white bread, demonstrating their suitability for better blood sugar control among consumers.

Keywords: Glycemic index, antioxidant activity, total phenolic content, bread, blood sugar response

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