

## Metabolic Profiling of Biofortified Bambara groundnut (*Vigna subterranea* [L]) Milk and Probiotic Beverage Powder

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### Abstract

The preference for biofortification of foods to increase nutrients which the food naturally lacks is gradually increasing. This study explores metabolites in biofortified and non-fortified Bambara groundnut (BGN) milk and probiotic beverage food powders. Biofortified BGN milk and probiotic (BGNM-BF and BGNP-BF) beverage food powders were produced using *Moringa oleifera* (0.5%), *Citrullus lanatus* (1.1%) and BGN protein isolate (15.7%). Antioxidant activity, phenolic compounds (Ultra performance liquid chromatograph-mass spectrometry [UPLC-MS]), polyphenol, amino acid (Ultra performance liquid chromatograph-photodiode array detector [UPLC-PDA]), fatty acid (Gas chromatography-flame ionisation detection [GC-FID]), sugar, and mineral content (Inductively coupled plasma-optical emission spectrometry [ICP-OES]) of biofortified and non-fortified BGN milk & probiotic (BGNM-NF and BGNP-NF) powders were investigated. The ferric reducing antioxidant power (FRAP), 2,2'-azino-di-3-ethylbenzthiazolone sulphonate (ABTS) and oxygen radical absorbance capacity (ORAC) of BGNM-NF, BGNM-BF, BGNP-NF, and BGNP-BF ranged from 2.91-6.83  $\mu\text{mol AAE/g}$ , 2.72-6.14  $\mu\text{mol AAE/g}$  and 50.11-114.01  $\mu\text{mol TE/g}$ , respectively and differed significantly ( $p < 0.005$ ). Phenolic compounds present included catechin glucoside, diethyl tartrate, chlorogenic acid and quercetin 3- galactoside ranges of 0.036-0.08 mg/g, 0.18-0.27 mg/g, 0.04-0.11 mg/g and 0.002-0.06 mg/g, respectively. Amino acid, fatty acid and mineral content increased after biofortification. The biofortification process enhanced the nutrient profile of BGN milk and probiotic food powders.