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Functional and Amino Acid Profile of Bambara Groundnut and Moringa Oleifera Leaf Protein Complex

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Abstract

Protein with good biological value is essential for a healthy diet and sustainable nutrition particularly in countries where malnutrition is dominant. Combinations of indigenous ingredients lacking in certain essential amino acids could be used to obtain a protein isolate with a better amino acid profile that can be used as a functional food ingredient and suitable raw material for the food industry. Bambara groundnut and *Moringa oleifera* leaf protein complex (BAMOLP) was produced using Bambara groundnut protein isolates (BGNPI) and *Moringa oleifera* leaf protein isolate (MOLPI). The protein isolates and complex (BGNPI, MOLPI and BAMOLP) were subjected to amino acid analysis and functional tests (water absorption capacity, oil absorption capacity, foaming capacity, foaming stability, emulsifying capacity, emulsifying stability, swelling capacity and water activity). The total amino acids in BGNPI, MOLPI and BAMOLP were 75.11, 50.00 and 71.83 g/100 g, respectively. The essential amino acid of the protein isolates were 39.83, 47.88 and 40.83% of the total amino acids, respectively, while the non-essential amino acid were 60.17, 52.12, and 59.17% of the total amino acids, respectively. BAMOLP has the highest content of lysine, asparagine and glutamine compared to BGNPI and MOLPI. The oil absorption capacity (OAC) of BGNPI, MOLPI and BAMOLP were 2.26, 0.89 and 0.95 g/g respectively while the water absorption capacity (WAC) for BGNPI, MOLPI and BAMOLP were 1.31, 1.5 and 1.22 g/g. The WAC and swelling capacity of the BGNPI, MOLPI, and BAMOLP increased with temperature. The foaming capacity was pH dependent. BAMOLP exhibited a higher emulsifying capacity and stability than BGNPI and MOLPI. BAMOLP exhibited better amino acid profile compared to its precursors, BGNPI and MOLPI.

Biography: Olawumi Adewumi

Kemi is a registered master student in the Department of Food Science and Technology, Cape Peninsula University of Technology, Cape Town, South Africa under Professor V.A. Jideani who is a rated researcher.