AMINO ACIDS PROFILE OF GERMINATED BROWN FINGER MILLET COMPLEMENTED WITH BAMBARA NUT PROTEIN CONCENTRATE AND CARROT FLOUR

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Background and Objectives: Complementary foods are foods other than breast milk or infant formula introduced to an infant to provide nutrients (1). Germination has been demonstrated to be effective method that can be utilize to enhance the nutritional quality of flours, modify textural characteristics, predigest high molecular weight macromolecules and reduce antinutrients contents. Therefore, the study examined the amino acids profile of germinated brown finger millet complemented with bambara-nut protein concentrate and carrot flour.

Materials and Method: Brown finger millet, bambara-nut and carrot roots were purchased from Kure Ultra-market in Minna, Niger State. The brown finger millet were sorted, washed and then soaked in distilled water for 12hrs, at ambient temperature. The water was changed every 4hrs to avert fermentation. The soaked brown finger millet were distributed on jute bags and allowed to germinate for 24hrs while water was sprinkled on it every 3hrs. After germination, it was oven dried for 12hrs, then milled. Method by (2) with minor alterations was used in the production of bambara-nut protein concentrate. The samples were blended in ratio 60:10:30, 65:10:25 and 70:10:20. A, B, C, respectively while D serves as control. Samples were then analysed using the ISOCRATIC HPLC machine to determine amino acids profile. All evaluation tests were conducted in triplicates. The analyses were conducted in triplicates. Data obtained were subjected to one-way analysis of variance and differences among the means were determined using Duncan multiple range test. Statistical Package for the Social Sciences (SPSS) version 23.0 was used to analyse the data and $p<0.05$ was considered to be statistically significant.

Results and Discussion: From the results obtained in table 1, it was established that sample A (60% germinated brown finger millet flour, 10% of bambara-nut protein concentrate, 30% carrot flour). Statistically, there were variation across amino acids profile with sample A having the

highest value of amino acids composition of 31.07mg/100g, followed by sample B, 29.43mg/100g, and sample C, 20.82mg/100g respectively while the control had the least value of 12.59mg/100g. Conversely, amino acids profile increase with decrease in percentage of germinated brown finger millet inclusion and increase in percentage of carrot flour.

Conclusion: Sample A was the best based on the nutritional quality of the formulated blends.

Table 1: Amino acids profile of the formulated blends and control (commercial product)

Amino acids	A	B	C	Control
Tryptophan	2.13^{a}±0.014	1.98^{b}±0.007	0.85^{c}±0.007	0.46^{d}±0.021
Histidine	1.84^{a}±0.014	1.66^{b}±0.007	1.75^{c}±0.014	0.45^{d}±0.000
Leucine	2.40^{a}±0.007	2.12^{b}±0.007	1.89^{c}±0.007	1.15^{d}±0.014
Isoleucine	2.29^{c}±0.021	2.12^{c}±0.007	2.08^{c}±0.007	0.56^{d}±0.368
Phenylalanine	1.59^{a}±0.014	1.32^{b}±0.007	1.27^{c}±0.014	0.81^{d}±0.014
Valine	1.17^{b}±0.007	1.02^{c}±0.014	0.97^{d}±0.007	0.95^{d}±0.014
Lysine	1.97^{a}±0.021	1.77^{b}±0.014	1.89^{c}±0.021	0.87^{d}±0.000
Methionine	3.37^{a}±0.007	3.29^{b}±0.000	0.97^{c}±0.014	0.41^{d}±0.007
Threonine	1.63^{a}±0.007	1.69^{b}±0.014	0.37^{c}±0.007	0.37^{c}±0.007
Asparagine	1.95^{a}±0.014	1.86^{b}±0.007	0.49^{c}±0.007	0.20^{d}±0.014
Arginine	0.78^{a}±0.014	0.83^{b}±0.014	0.68^{c}±0.007	0.41^{d}±0.007
Alanine	0.89^{a}±0.007	1.04^{b}±0.007	1.00^{c}±0.014	0.79^{d}±0.007
Aspartate	1.26^{a}±0.014	1.15^{b}±0.014	0.73^{c}±0.014	1.32^{d}±0.014
Glutamate	2.35^{c}±0.007	2.18^{c}±0.014	1.43^{d}±0.014	1.30^{d}±0.205
Glycine	0.68^{b}±0.007	0.54^{c}±0.014	0.55^{c}±0.014	0.40^{d}±0.021
Tyrosine	1.27^{b}±0.014	1.34^{c}±0.000	0.62^{d}±0.014	0.64^{d}±0.014
Cysteine	0.86^{a}±0.014	0.90^{b}±0.014	1.18^{c}±0.007	0.30^{d}±0.014
Proline	0.87^{a}±0.014	0.95^{b}±0.000	1.25^{c}±0.007	0.24^{d}±0.007
Serine	1.77^{a}±0.007	1.67^{b}±0.007	0.85^{c}±0.007	0.96^{d}±0.007

Means on the same column with different superscript letter are significantly different ($p<0.05$) while those with the same superscript letter are not significantly different ($p>0.05$).

KEYS

A: 60% germinated brown finger millet flour, 10% of bambara nut protein concentrate, 30% carrot flour.

B: 65% germinated brown finger millet flour, 10% bambara nut protein concentrate, 25% carrot flour.

C: 70% germinated brown finger millet, 10% bambara nut protein concentrate, 20% carrot flour.

D: Control (Commercial product).

References

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