

Proximate Composition and Sensory Properties of Complementary Food from Fermented Acha (*Digitaria exilis*), Soybean and Orange-Flesh Sweet Potato Blends

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Abstract : Childhood malnutrition is one of the most persistent public health problems throughout developing countries, including Nigeria. Demographic and Health survey data from twenty-one developing countries indicated that poor complementary feeding of children aged 6- 23 months contributes to negative growth trends. To reduce malnutrition among children in the society, formulation of complimentary food rich in essential nutrient for optimum growth and development of infants is essential. This study focused on the evaluation of complementary food produced by solid-state fermentation of Acha and Soybean using *Rhizopus oligosporus* (2710) and Orange-fleshed sweet potatoes (OFSP) using *Lactobacillus planterum* (B-41621). The raw materials were soaked separately, each in four volumes of 0.9M acetic acid for 16 hours, rinsed with clean water, steam cooked and cooled. Solid-state fermentation (SSF) was carried out by inoculating Acha and Soybean with spore suspension (1×10^6 spores/ml) of *Rhizopus oligosporus* (2710) and OFSP with spore suspension (1×10^6 spores/ml) of *Lactobacillus planterum* (B-41621). Fermentation which lasted for 72 hours was carried out with 24 hours sampling. The samples were blended in the following ratios: Acha and soybean 100: 100 (AS), Acha/soybean and OFSP 50: 50 (ASO), made into gruel and compared with a commercial infant formula (Cerelac) which served as the control (CTRL). The samples were analyzed for proximate composition using AOAC methods and sensory attributes using a hedonic scale. Results showed that moisture, crude protein, fibre and ash content increased significantly ($p < 0.05$) as fermentation progressed, while carbohydrate and fat content decreased. The protein, moisture, fibre and ash content ranged from 17.10-19.02%, 54.97-56.27%, 7.08-7.60% and 2.09-2.38%, respectively, while carbohydrate and fat content ranged from 12.95-10.21% and 5.81-4.52%, respectively. In sensory scores, there were no significant ($p > 0.05$) difference between the average mean scores of colours, texture and consistency of the samples. The sensory score for the overall acceptability ranged from 6.20-7.80. Sample CTRL had the highest score, while sample ASO had the least score. There was no significant ($p > 0.05$) difference between samples CTRL and AS. Solid-state fermentation improved the nutritional content and flavour of the developed complementary food, which is needed for infant growth and development.

Keywords : Complementary food, malnutrition, proximate composition, solid-state fermentation

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