Towards Promoting Food Security: The Role of Malted-Sorghum, Soymilk Residue (Okara), and Cashew Nut in Biscuit Production

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Introduction

Biscuits, normally produced from wheat flour, are consumed by all age groups globally. It has been recommended that composite flour, either with or without wheat flour, can be used for the manufacture of biscuits. Many researchers have produced snacks with malted sorghum. However, the snacks are usually low in many vital nutrients, which calls for supplementation. Soymilk residue (okara), considered waste material from soymilk or soybean curd processing, is rich in many essential nutrients and has good functional characteristics, which makes it ideal for use in baking applications (Hanna *et al*., 2023). Cashew nut (*Anacardium occidentale Linn*) contains diverse components of nutritional and health significance. This study investigates the functional characteristics of the composite flours of malted sorghum, okara, and cashew nut and assesses the proximate and sensory.

Materials and methods

Sorghum, soybean and cashew nuts were sourced from local farmers, while other ingredients such as baking powder, sugar, salt, eggs and margarine were bought from Sayedero market in Ilaro. Composite flour blends were made by combining malted sorghum, okara and cashew nut in the following ratio: 80:20:0, 80:15:5, 70:25:5, 65:30:5 and 60:35:5, respectively. Selected functional properties of composite flour blends were evaluated. Proximate composition and sensory evaluation tests were carried out for biscuits produced from the composite flours.

Results and discussion

Results of the functional properties of the flour blend showed a significant increase in the bulk density (0.63 - 0.70 g/ml), water absorption capacity (WAC) (193.38 - 341.36%), an increase in swelling power (5.72 - 7.18%) and oil absorption capacity (OAC) (174.59 - 212.75%) with increase in the level of soybean residue (okara) flour incorporated into the flour blends. The observed increase in the selected functional properties might be due to the excellent emulsion qualities, high moisture retention, and good fat-binding capacity of okara's protein (Hanna *et al*., 2023). Proximate analysis results showed that as the level of okara flour incorporated increased, there was a significant increase ($p \leq 0.05$) in the protein (9.90 – 15.57%), crude fat (4.58 - 6.77%) and moisture content (6.89 - 7.49%); while there was a decrease in the total ash (1.55 - 0.90), crude fibre (0.86 - 0.13%) and carbohydrate (76.24 - 69.15%). In terms of the sensory analysis, biscuit samples from 70% malted sorghum, 25% okara and 5% cashew nut composite flour were the most preferred for all the sensory attributes (appearance, colour, taste, aroma, crunchiness, mouth feel, willingness to buy and overall acceptability) evaluated.

Conclusions

This study indicates that sensorial acceptable and nutritionally rich biscuits can be produced from malted sorghum, soymilk residue (okara) and cashew nut.

Keywords

Soymilk residue, Okara, Proximate Analysis, Waste valorization, Cashew nut.