

UPGRADING THE NUTRITIONAL QUALITY OF *ELEKUTE* THROUGH ENRICHMENT WITH AFRICAN YAM BEAN (*Sphenostylis stenocarpa*)

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INTRODUCTION

- Low nutritional value and variable sensory quality arising from non-standardized processing operations characterize some Nigerian maize-based snacks including *elekute*. *Elekute* is widely consumed as snack in South Western part of Nigeria.

Objectives

- Optimize *elekute* production
- Improve nutritional contents of *elekute* by incorporating African yam bean (AYB)-a nutrient-dense but underutilized crop (Biodiversity, 2009).

METHODS

- ❖ African yam bean (Tss-30) was processed into African yam bean flour (AYBF) by dehulling manually after soaking in water (1:5w/v) for 4h at $29\pm 2^\circ\text{C}$, boiled for 20 min dried at $60\pm 2^\circ\text{C}$. Then toasted and milled into flour ($500\mu\text{m}$).
- ❖ Using Box-Behnken design of Response Surface Methodology (RSM), yellow maize (BR-9928-DMR-SY) was toasted at varied temperatures (120, 130 and 140°C) and time (8, 10 and 12min). Toasted AYBF was substituted into toasted maize flour at ratios 20:80, 30:70 and 40:60 according to the experimental design. Each blend was properly mixed to obtain homogenous blend.
- ❖ Proximate composition, minerals and sensory attributes of the samples were determined. Samples with best product's qualities were obtained from RSM as optimum processing conditions. Data were analyzed statistically.

Table 1: Proximate composition (%) of different ratio of toasted maize (M) flour and toasted African yam bean (AYB) flour blends

Samples	Crude fat	Crude Protein	Crude Fibre	Total Ash	Moisture content	Starch	Sugar
100%MF	5.77±0.41a	9.50±0.82d	1.74±0.41d	1.89±0.09c	8.59±0.05a	68.71±0.04a	3.80±0.29d
20%AYBF	4.94±0.25b	12.28±0.61c	2.84±0.21c	2.12±0.11b	8.69±0.07a	64.05±0.11b	4.98±0.18c
30%AYBF	3.41±0.22c	15.51±0.21b	4.98±0.50b	2.31±0.16b	8.98±0.14a	58.01±0.15c	6.80±0.11b
40%AYBF	2.57±0.01d	19.61±0.07a	6.28±0.11a	2.83±0.18a	8.93±0.12a	51.23±0.21d	8.55±0.02a

Values are averages of three replicates. Same superscripts indicate no significance difference ($p>0.05$)

DESIGN-EXPERT Plot

sens.perc.
X = B: f.temp
Y = C: f.time

Actual Factor
A: blend = 30.00

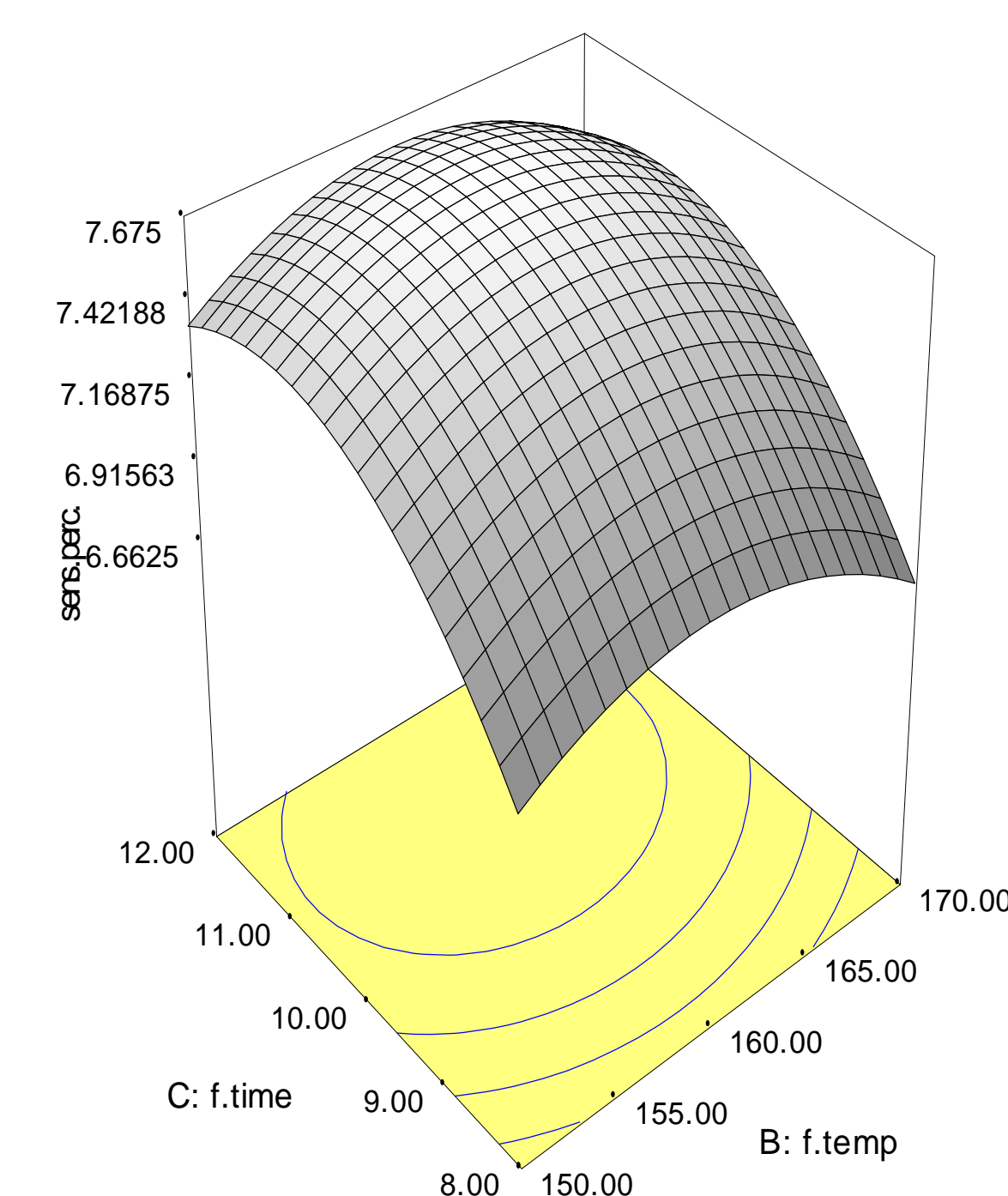


Figure 1 Effect of toasting temperature (x_2) and toasting time (x_3) on Sensory perception (overall acceptability).

RESULTS

- Protein (9.50 – 19.61%), ash (1.89-2.83%), sugar (3.80-8.55%) increased, fat (5.77-2.57%), starch (68.71-51.23%) and moisture contents (8.93-8.59%) decreased with increase in % AYBF of the flour blends (Table1).
- With increasing quantity of AYBF, significant ($p<0.05$) increase was obtained for potassium, iron and sodium contents while no significant ($p>0.05$) was obtained for zinc, copper, manganese, manganese, calcium and magnesium contents of the flour blends.
- Sensory perception varied significantly ($p<0.05$) among the product especially for appearance and taste (5.1-7.9).
- Toasting temperature (135°C), toasting time (11.5min) and 30% AYBF were the optimum conditions obtained. The result of the validation showed a standard error ranging between 0.01 and 0.13.

CONCLUSION

Acceptable *elekute* was produced from flour blends of maize and AYB, creating a novel use for AYB and increased nutritional content of *elekute*. Creating novel uses for underutilized crops could be a step towards achieving food security. The optimum conditions for its production were established thereby standardizing the processing operations for obtaining uniform sensory qualities.

REFERENCE

- Biodiversity, 2009. African yam bean- a neglected and underutilised species
http://www.biodiversityinternational.org/scientific_information/themes/neglected_and_underutilised_species/overview.html accessed on 25 February 2010.

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