

EVALUATION OF DIFFERENT SLURRY MATERIALS FOR KILISHI PROCESSING

¹Labaran, S., ²Abdu, S.B., ²Zahraddeen, D., ³Makeri, M.I., ⁴Umar, M.M. and ⁵Ghude, M.I.

¹Katsina State Local Government Service Commission, Katsina

²Department of Animal Science, Ahmadu Bello University, Zaria, Kaduna State

³National Agricultural Extension Research and Liaison Services, Ahmadu Bello University, Zaria, Kaduna State

⁴Department of Animal Science, Federal University of Kashere, Gombe State

⁵Agricultural Services Department, Ministry of Local Government and Chieftaincy Affairs, Kano state

Corresponding author: sanilabaran@gmail.com, 0803 610 0189

Abstract

This study evaluated the proximate composition of three different slurry materials: groundnut, tigernut, and sesame used in *Kilishi* processing. The aim was to determine the most nutritionally suitable slurry for improving the quality and nutritive value of *Kilishi*, a popular Nigerian dried meat product. The experiment involved proximate analyses of the slurry materials to determine dry matter, crude protein, crude fibre, lipid, ash, and carbohydrate contents using standard methods. Results showed significant ($p < 0.05$) differences across all parameters. Dry matter content was highest in sesame (96.45%) and lowest in groundnut (91.95%). Groundnut slurry recorded the highest crude protein (15.07%) and lipid (45.40%) values, while tigernut slurry contained the highest carbohydrate (84.15%) but the lowest crude protein (4.25%). Ash content was highest in sesame slurry (6.08%). The findings indicate that groundnut and sesame slurries are nutritionally richer sources of protein and fat, making them more suitable for *Kilishi* processing, while tigernut slurry is more energy-dense due to its high carbohydrate level.

Keywords: *Kilishi*, slurry materials, proximate composition, groundnut, sesame, tigernut

Description of Problem

Kilishi is a traditional Nigerian dried meat product prepared by coating thin meat slices with a spiced slurry before drying and roasting [1]. The slurry serves as a source of flavour, nutrients, and protection against microbial spoilage. Conventionally, groundnut slurry is used in most *Kilishi* preparations [2]. However, other plant-based materials such as sesame and tigernut may serve as potential substitutes or complements due to their unique nutritional properties. Evaluating the proximate composition of these slurry materials is therefore essential to determine their suitability and potential for improving the nutritional and sensory quality of *Kilishi*.

Methodology

The study was carried out at the Product Development Laboratory of Institute for

Agricultural Research (IAR), Ahmadu Bello University, Zaria. Three slurry materials, groundnut, tigernut, and sesame were sourced from local markets, cleaned, dried, and milled into fine pastes. Proximate composition analyses were conducted in triplicate following the procedures of the Association of Official Analytical Chemists [3]. The parameters determined were dry matter, crude protein, crude fibre, lipid, ash, and carbohydrate content (calculated by difference). Data obtained were subjected to one-way analysis of variance (ANOVA) using Statistical Analysis Software, and mean separation was done using Duncan's Multiple Range Test at a 5% level of significance ($p < 0.05$) [4].

Results and Discussion

The proximate composition of the three slurry materials is presented in Table 1. There were significant ($p < 0.05$) differences among the

slurries in all measured parameters. The proximate composition of the slurry materials showed significant ($p < 0.05$) differences across all evaluated parameters. Dry matter content was highest in sesame slurry (96.45%), followed by tigernut (95.06%) and groundnut (91.95%), indicating that sesame and tigernut slurries have lower moisture content and are likely to offer better storage stability and reduced microbial growth during *Kilishi* processing. Groundnut slurry had the highest crude protein content (15.07%), demonstrating its superior potential for improving the protein value of *Kilishi*, while sesame (6.82%) and tigernut (4.25%) recorded comparatively lower levels. This finding supports previous reports that groundnut is a protein-rich legume suitable for enhancing the nutritive quality of meat-based products [5].

Lipid content was also significantly higher in groundnut (45.40%) and sesame (38.63%) slurries than in tigernut (3.26%), confirming that these two materials are better sources of dietary fats and contribute to energy density and

desirable mouthfeel in *Kilishi*. The crude fibre content ranged from 10.34% in sesame to 12.03% in groundnut, indicating that all slurries contained moderate fibre levels that can aid digestion without compromising texture [2,5]. Ash content, an indicator of mineral composition, was highest in sesame slurry (6.08%), suggesting it provides more essential minerals compared to tigernut (3.40%) and groundnut (1.40%). Carbohydrate content, on the other hand, was markedly higher in tigernut slurry (84.15%), while sesame (44.92%) and groundnut (30.08%) recorded lower values. The high carbohydrate content in tigernut slurry implies a greater energy yield and potential for enhancing sweetness, although it may dilute the protein concentration [2]. Overall, the results indicate that groundnut slurry offers the best balance of protein and lipid for nutrient enrichment, sesame provides a superior mineral profile and shelf-stable dry matter content, while tigernut serves as an energy-rich component that can improve taste and energy value.

Table 1: Proximate composition of slurry materials

Composition (%)	Groundnut	Tigernut	Sesame	SEM
Dry matter	91.95 ^b	95.06 ^a	96.45 ^a	1.14
Crude Protein	15.07 ^a	4.25 ^c	6.82 ^b	1.06
Crude Fibre	12.03	11.50	10.34	1.33
Lipid	45.40 ^a	3.26 ^b	38.63 ^a	4.31
Ash	1.40 ^c	3.40 ^b	6.08 ^a	0.64
Carbohydrate	30.08 ^c	84.15 ^a	44.92 ^b	5.68

^{abc} Means with different superscripts along the same row are significantly different ($P < 0.05$), SEM: standard error of means

Conclusion and Application

The study revealed that groundnut and sesame slurries are nutritionally superior for *Kilishi* processing due to their higher protein, lipid, and mineral content compared to tigernut. Tigernut slurry, though high in carbohydrate, may serve as a supplementary source for improving taste and energy value. Therefore, groundnut or sesame slurry, or their combination, is recommended for high-quality, nutrient-dense *Kilishi* production.

References

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