



PROXIMATE COMPOSITION AND CONSUMER ACCEPTABILITY OF SNACKS INDIGENOUS TO ZURU COMMUNITY IN KEBBI STATE

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ABSTRACT

The study assessed the proximate composition and consumer acceptability of selected indigenous snacks (Chikaka, Gare, Yamperinyela, and Hekko) produced in Zuru Community, Kebbi State, Nigeria. An experimental design was used, with snacks formulated from locally available ingredients such as millet, cowpea, rice, sesame, and guinea corn. Proximate analysis was conducted using AOAC methods, while sensory evaluation involved 50 semi-trained panelists using a 9-point hedonic scale. Findings showed differences in nutrient composition among the snacks. Chikaka had the highest crude protein, fat, ash, and moisture contents, while Hekko recorded the highest carbohydrate and crude fibre values. Gare and Yamperinyela showed moderate nutritional values. Sensory results indicated that all snacks were generally acceptable, with scores above average. Chikaka was most preferred in appearance, Yamperinyela in taste and flavour, Hekko in colour and texture, while Gare had the highest overall acceptability. The study concluded that these indigenous snacks are both nutritious and well accepted, and recommends their promotion and commercialization as affordable dietary options to improve nutrition and reduce malnutrition in rural communities.

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INTRODUCTION

Malnutrition remains a major public health challenge in many developing countries, particularly among vulnerable populations in rural communities where access to nutrient-dense foods is often limited. Adequate nutrition is essential for growth, development, disease prevention, and overall well-being. However, inadequate dietary intake continues to contribute to protein-energy malnutrition, micronutrient



deficiencies, and poor health outcomes among children and adults in many parts of Nigeria (Olamide & Abe, 2024). Snacks constitute an important component of daily dietary intake because they provide additional energy and nutrients between regular meals. When properly formulated, snacks can significantly contribute to meeting daily nutritional requirements, especially in resource-constrained settings. Indigenous snacks prepared from locally available crops such as millet, cowpea, rice, sesame, and guinea corn possess considerable nutritional potential due to their protein, carbohydrate, vitamin, mineral, and dietary fibre contents (Martini et al., 2021).

In Kebbi State, particularly among the indigenous people of Zuru community, traditional snacks such as *chikaka*, *gare*, *yamperinyela*, and *hekko* are commonly consumed. These snacks are produced using locally sourced agricultural products and represent an important aspect of the cultural heritage and dietary practices of the people (Galadima, 2021). Despite their popularity and widespread consumption, limited scientific information exists regarding their nutritional composition and consumer acceptability.

The increasing emphasis on food-based approaches to combating malnutrition has heightened the need to evaluate indigenous foods that can serve as affordable and sustainable sources of nutrients. Nutritional evaluation of traditional foods provides evidence for their inclusion in community nutrition programmes and food security interventions. According to Ahmad et al. (2022), the utilization of indigenous food resources offers a practical strategy for improving dietary quality while preserving local food culture.

Therefore, assessing the proximate composition and consumer acceptability of indigenous snacks consumed in Zuru community is necessary to establish their nutritional value and determine their potential contribution to improving food and nutrition security among vulnerable populations.

STATEMENT OF THE PROBLEM

Even though the Zuru emirate is blessed with rich agricultural land, malnutrition especially protein-energy malnutrition continues to heavily impact vulnerable groups like young children, adolescents, and pregnant women. The root of the problem is that many rural families rely too much on starchy staple foods that simply do not have enough essential micronutrients or digestible proteins. At the same time, factory-made, processed snacks are flooding rural markets, but they are usually overpriced and have most of their natural nutrients stripped away during production.

Compounding this issue, Onyiriuka, Egbagbe, and Onyiriuka (2013) pointed out that adolescent girls frequently turn to these energy-dense commercial snacks and sugary soft drinks. This shift in eating habits traps communities into relying on low-quality, high-sugar, and high-sodium options instead of making wholesome dietary choices. On the bright side, traditional local snacks like *chikaka*, *gare*,



yamperinyela, and *hekko* are naturally packed with nutrients because they are made from wholesome local crops. Unfortunately, these traditional foods are often unappreciated, poorly documented, and being pushed aside by modern dietary changes.

The real issue behind this study is that we lack solid, scientific data on the exact nutritional worth and everyday appeal of these local snacks. Without a proper nutritional breakdown and formal taste tests, public health officials, extension agents, and home economists cannot confidently recommend them for community nutrition programs. This study steps in to bridge that gap by taking a close, scientific look at these indigenous snacks, proving they are affordable, culturally trusted tools that can help beat protein-energy malnutrition.

OBJECTIVES OF THE STUDY

The primary objective of this study was to evaluate the proximate composition and consumer acceptability of traditional snacks indigenous to the Zuru community of Kebbi State, Nigeria, to support affordable dietary interventions.

The specific objectives were to:

1. Determine the proximate composition of selected indigenous snacks produced in Zuru Community, Kebbi State.
2. Assess the sensory attributes and overall consumer acceptability of selected indigenous snacks produced in Zuru Community, Kebbi State.

METHODOLOGY

The study adopted an experimental research design to evaluate the proximate composition of selected traditional snacks indigenous to Zuru LGA, Kebbi State. The approach involved the preparation of snack samples, laboratory analysis for proximate composition and sensory evaluation using standard methods

Sample Preparation-Snacks production

The raw materials needed for the production of selected traditional snacks ('chikaka', 'gare' 'yamperinyela' and 'hekko') are cowpea, rice, millet, sesame and guinea corn were purchased from the market. Chikaka is a cowpea pancake like product garnished with sauce or stew of cowpea beans flour (50%) was mixed with water (50%), stirred to have a homogenous mixture to make batter. The cowpea batter is smeared in a frying pan and turned several times to avoid sticking to the surface. The cowpea pancake like product is garnished with fried oil, onion and pepper for it to be ready to serve. However, Gare is a combination of guinea corn (75%) with sesame (25%); it was prepared by boiling guinea corn



until pre-cooked, pounded severally, sieved to make a fine texture dough. While the sesame was toasted on low heat until light brown. The pre-cooked guinea corn dough and toasted sesame were mixed together. While Yamperinyela is a combination of millet (50%) and cowpea beans (50%). The millet and beans were boiled separately after which the water was strained and were mixed well, served hot and garnished with fried oil and powdered pepper. Sesame was first cleaned and toasted on low until it turns light brown and brings nutty aroma. The raw rice was cleaned, and soaked for an hour until soft after which the water is drained completely and the toasted sesame added. Sugar can be sprinkled on it for sweetening.

Methods

Proximate Analysis was carried out using standard methods of Association of Official Analytical Chemists (AOAC), while a panel of Fifty (50) semi-trained sensory panelists selected from members of the Zuru community who were familiar with the consumption of indigenous snacks. Evaluators scored the sample based on preference for the products using a 9-point hedonic scale.

RESULTS

Objective One: Proximate Composition of Produced Snack

Table 1: Proximate Composition of Produced Snacks (%)

Sample	Crude protein	Fat	Ash	Crude fibre	Moisture	NFE
A	19.73	6.01	2.86	4.46	7.67	59.27
B	13.31	5.20	2.04	5.01	7.18	67.26
C	14.43	4.35	2.23	4.78	6.56	67.65
D	12.67	4.45	1.23	5.21	6.26	70.18

Values are means of duplicates

NFE (Nitrogen Free Extract) = Carbohydrate content

Samples: A= Chikaka B= Gare C= Yamperinyela D= Hekko

Table 1 shows variations in the proximate composition of the selected indigenous snacks produced in Zuru Community. Sample A recorded the highest crude protein, fat, ash, and moisture contents, indicating superior nutrient density compared to the other samples. Sample D, on the other hand, had the highest carbohydrate and crude fibre contents but the lowest protein and ash values. Samples B and C exhibited moderate values across most parameters. Thus, the results indicate clear nutritional differences among the snacks, reflecting variations in their raw materials and formulation methods.

Objective Two: Sensory Evaluation of the Produced Snacks

**Table 2: Sensory Evaluation of the Produced Snacks**

Sample	Appearance	Taste	Colour	Texture	Flavor	General acceptability
A	7.4	6.8	6.5	6.6	6.6	6.6
B	6.8	6.4	6.0	6.2	6.5	7.3
C	6.6	7.0	6.4	6.6	7.4	6.3
D	6.7	6.8	7.2	7.0	6.1	6.7

Samples: A= Chikaka B= Gare C= Yamperinyela D= Hekko

Table 2 shows that all the selected indigenous snacks were generally acceptable to consumers, with mean sensory scores above average. Each sample demonstrated distinct strengths: Sample A was most preferred in appearance, Sample D in colour and texture, Sample C in taste and flavour, while Sample B recorded the highest overall general acceptability. Thus, the results indicate that all the snacks are acceptable, with slight variations in specific sensory attributes..

CONCLUSION

The study demonstrated that the traditional snacks indigenous to the Zuru community are excellent sources of essential nutrients, successfully meeting standard dietary protein requirements (18-25%). The nutritional superiority of chikaka and yamperinyela highlighted the benefit of using cowpeas as a foundational ingredient to boost protein, ash, and healthy fat levels. The sensory evaluation proved that these formulations enjoy strong cultural familiarity and community acceptance. Chikaka was highly favored for its exceptional taste and appearance, while hekko stood out for its appealing color and texture.

Ultimately, utilizing locally available agricultural assets like millet, cowpeas, rice, sesame, and guinea corn provides a sustainable, cost-effective, and culturally relevant strategy to improve protein intake, support rural economies, and combat malnutrition in vulnerable populations.

RECOMMENDATIONS

1. The production and consumption of indigenous snacks such as Chikaka, Gare, Yamperinyela, and Hekko should be encouraged due to their good nutritional value and high consumer acceptability.
2. Local processors and stakeholders should be supported to improve standardization, hygiene, and packaging of these snacks to enhance their marketability and wider acceptance.



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