

EVALUATION OF LOCAL CONDIMENT ‘OGIRI’ PRODUCED FROM AFRICAN LOCUST BEANS, MELON AND PUMPKIN SEEDS

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Abstract

The study investigated ogiri production using African locust bean, fluted pumpkin and melon seeds using quality and consumer acceptability of the product. The proximate composition and functional properties were determined and it was also subjected to sensory evaluation in terms of taste, colour, texture, aroma and overall acceptability on 9-point hedonic scale ranging as excellent (9) and poor (1). Ogiri produced from African locust bean seeds had protein content of $18.320 \pm 0.090\%$, moisture of $35.430 \pm 0.225\%$, and Carbohydrate value of $30.940 \pm 0.252\%$. Ogiri produced from fluted pumpkin seeds had protein content to be $14.710 \pm 0.090\%$, moisture of $2.753 \pm 0.371\%$, and Carbohydrate value of $62.733 \pm 0.097\%$. The ogiri produced from melon seeds had a proximate composition of 12.64 ± 0.193 , 4.717 ± 0.190 and 59.283 ± 0.201 for protein, moisture and carbohydrate respectively. The sensory evaluation result showed that people preferred ogiri produced from melon seeds to either fluted pumpkin or African locust bean seeds, shown 80%, 80% and 50% acceptance respectively.

Keywords: Ogiri; african locust bean; melon; pumpkin fluted; proximate composition.

Introduction

Fermented foods contribute significantly to food culture across the globe, providing varietal supply of massive food or condiments. Preserving by fermentation not only made food available for future use, but more digestible (Egwim *et al.*, 2013). Plant seeds rich in protein and oil are fermented to produce seasonings that enhanced the taste of foods. Such seasonings include iru, ogiri, ugba and okpenye, which are fermented products of African locust bean, melon or castor oil seeds, oil bean seeds (Ifediba and Egbun, 2020).

Ogiri is one of the condiments consumed in the Eastern and Western parts of Nigeria (David and Aderibigbe, 2010). Traditional preparation of ogiri from selected legumes is by the method of uncontrolled solid-state fermentation and involves boiling the raw seeds after which they are de-hulled, and then re-boiled to soften seeds for fermentation (Achi, 2005).

In Africa, indigenous vegetables remain popular in rural areas where they are often considered to be more nutritive than exotic vegetables. Fluted pumpkin is an important seed vegetable indigenous to Southern Nigeria and grown in the forest zone of west and central Africa (Schipper, 2000). The leaf is of high nutritional, medicinal and industrial values rich in protein (29%), fat (18%) and minerals and vitamins (20%) (Akanbi *et al.*, 2006). Seeds have high nutritive

and calorific values which make it necessary in diets. Fluted pumpkin seeds like other legumes contains plant proteins and oil that can be fermented into highly flavoured seasoning. However, little work has been reported on the comparative study and consumer acceptability of Ogiri production, a food condiment made from African locust bean, melon and fluted pumpkin seeds. Hence, the comparative evaluation of melon and fluted pumpkin associated with Ogiri becomes imminent. Thus, this work was carried out to examine the proximate composition, functional properties and consumers' acceptability of 'Ogiri' produced from fermented African locust bean, fluted pumpkin and melon seeds.

Materials and methods

Sample preparation and procurement

The seeds used were purchased from Towobowo market, situated in Ibarapa Central Local Government Area of Oyo state, Nigeria. The raw materials were sorted, cleaned and washed to remove all extraneous matter. They were then dry and packaged separately in a plastic bag, ready for processing. All other chemicals used in this research were of analytical grade.

Production of Ogiri

Ogiri was produced from African Locust Bean Seed using the method describe by Ojewumi (2016) and

fluted pumpkin and melon seed using the method described by Ifesan *et al.*, (2019) and Muhammad (2011) with a fermentation period of 3 days.

Proximate analysis and functional properties of ogiri

Proximate composition of protein, moisture, fat, ash, crude fibre and carbohydrate content and functional properties such as water absorption, swelling capacity, solubility and oil absorption were determined using the method described by AOAC (2005).

Consumer acceptability of ogiri samples

Sensory Evaluation was carried out according to the method described by Iwe, (2010) to determine consumer acceptability of the ogiri produced from African locust bean, fluted pumpkin and melon seeds. Ten trained panellists were used to assess the sensory attributes (taste, colour, texture, aroma and overall acceptability) of the samples. The panellists were

selected by simple random sampling techniques comprising staffs of Oyo State College of Agriculture and Technology, Igboora who are familiar with the products. The samples were presented in plates with water to rinse mouth after each tasting. The panellists were instructed to rate the sample for the attributes based on a 9-point Hedonic scale ranging from 9- like extremely to 1- dislike extremely.

Statistical analysis

Results were expressed as the means of three separate determinations. The data were subjected to Analysis of Variance (ANOVA) using Mintab 18 software. Means were subjected to Tukey pairwise comparisons.

Results and discussion

Results

Table 1: Proximate composition of ogiri produced from locust bean, melon and pumpkin seeds

Samples	Protein	Moisture	Fat	Ash	Fibre	Carbohydrate
ALBS	18.320±0.090 ^a	35.430±0.225 ^a	18.867±0.237 ^{ab}	1.180±0.03 ^b	0.733±0.040 ^c	30.940±0.252 ^c
FPS	14.710±0.090 ^b	2.753±0.371 ^c	16.573±1.692 ^b	1.563±0.131 ^a	0.933±0.057 ^b	62.733±0.097 ^b
MS	12.64±0.193 ^c	4.717±0.190 ^b	20.713±0.673 ^a	1.727±0.136 ^a	1.727±0.136 ^a	59.283±0.201 ^a

ALBS= African locust Bean Seeds; FPS= Fluted Pumpkin Seeds; MS= Melon Seeds

Values on the same column having the same superscript letters are not significantly different ($p>0.05$)

Table 2: Functional properties of ogiri produced from locust bean, melon and pumpkin seeds

Samples	Water Absorption (%)	Swelling Capacity (%)	Solubility (g/ml)	Oil Absorption (g/ml)
Locust bean seeds	90.750±0.240 ^a	3.720±0.062 ^b	12.707±0.168 ^c	59.870±0.040 ^c
Fluted Pumpkin seed	86.470±0.741 ^b	4.547±0.156 ^a	26.987±0.100 ^a	80.420±0.079 ^b
Melon seed	78.530±0.465 ^c	2.930±0.031 ^c	17.317±0.117 ^b	84.747±0.068 ^a

Values on the same column having the same superscript letters are not significantly different ($p>0.05$)

**Table 3: Sensory evaluation of ogiri produced from african locust bean, melon and fluted pumpkin seeds**

Ranting	Taste			Colour			Texture			Aroma			Overall Acceptability		
	ALBS	FPS	MS	ALBS	FPS	MS	ALBS	FPS	MS	ALBS	FPS	MS	ALBS	FPS	MS
Like	50	70	70	60	80	60	70	70	70	60	70	70	50	80	80
extremely															
Like very much	50	30	30	40	20	30	30	30	30	10	20	20	30	20	20
Like moderately	0	0	0	0	0	10	0	0	0	30	10	10	20	0	0
Like slightly	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neither like nor dislike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dislike slightly	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dislike moderately	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dislike very much	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dislike extremely	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

ALBS= African locust Bean Seeds;FPS= Fluted Pumpkin Seeds;MS= Melon Seeds

Discussion

Proximate Composition of ogiri produced from African locust bean, fluted pumpkin and melon seeds were analysed and presented in table 2. The protein content of ogiri samples were significantly different ($p>0.05$) with the highest moisture content of $18.320\pm0.090\%$ from African locust bean $12.64\pm0.193\%$ from Fluted Pumpkin and $12.64\pm0.193\%$ from ogiri produced from melon seeds. The protein content observed in this study were found to be lower than the value reported by Okpo *et al.* (2022) for both African locust bean and fluted pumpkin seeds. The protein content of melon seeds observed in this study was also lower than the value reported by Ifesan *et al.* (2019). Similarly, there exist a significant different in moisture content of the three seeds used in the production of ogiri. African locust bean, fluted pumpkin and melon seeds had moisture of $35.430\pm0.225\%$, $2.753\pm0.371\%$ and $4.717\pm0.190\%$ respectively. The moisture content value observed in this study were found to be lower than the value reported by Okpo *et al.* (2022), Akwukwaegbu *et al.* (2020) and Ifesan *et al.*, (2019). Fat content of the three samples were analysed and it was observed that Ogiri produced from melon seed gave the highest percentage of fat content of ($20.713\pm0.673\%$) which was found to be lower than the value reported by Ifesan *et al.* (2019). Fat content of African locust bean and fluted pumpkin seeds observed in this study were $18.867\pm0.237\%$ and $16.573\pm1.692\%$ respectively and

found to be lesser than the value reported by Okpo *et al.*, (2022). The percentage ash content of the three samples used in Ogiri production ranged from $1.180\pm0.03\%$ - $1.727\pm0.136\%$. Ogiri from melon seeds had the highest ash content of $1.727\pm0.136\%$ and ogiri made from African locust bean seeds had the lowest ash content of $1.180\pm0.03\%$ %. Ogiri produced from melon seeds recorded the highest percentage fibre content of $1.727\pm0.136\%$ while ogiri produced from African locust bean seeds had the least value of $0.733\pm0.040\%$. Also, carbohydrate content of the three seeds used in production of ogiri were analysed. Values of $30.940\pm0.252\%$, $59.283\pm0.201\%$ and $62.733\pm0.097\%$ were obtained for African locust bean, melon and fluted pumpkin seeds respectively.

Functional properties of the samples were analyzed comprising of ogiri produced from African locust bean, fluted pumpkin and melon seeds as presented in table 2.

The water absorption rate of the ogiri produced from African locust bean is $90.750\pm0.240\%$, $86.470\pm0.741\%$ for ogiri processed from fluted pumpkin and $78.530\pm0.465\%$ for ogiri produced from melon seeds. The result showed that ogiri produced from African locust bean seeds had the highest rate of water absorption, followed by that of fluted pumpkin and melon seeds. The swelling capacity of African locust bean seeds $3.720\pm0.062\%$, fluted pumpkin seed is at $4.547\pm0.156\%$ while the swelling capacity

of ogiri made from melon seeds is $2.930 \pm 0.031\%$. The solubility of the three seeds used in production of ogiri was determined. The solubility of ogiri produced from African locust bean seeds is $12.707 \pm 0.168\%$, $26.987 \pm 0.100\%$ for ogiri produced from fluted pumpkin seeds and $17.317 \pm 0.117\%$ ogiri made from melon seeds.

The rate of the ogiri produced from African locust bean seeds for absorption of oil is $59.870 \pm 0.04\text{g/ml}$, $80.420 \pm 0.079\text{g/ml}$ ogiri processed from fluted pumpkin seeds while the rate of oil absorption in ogiri made from melon seeds is $84.747 \pm 0.068\text{g/ml}$. The functional properties parameters examined for the three samples of seeds in production of ogiri were significantly different from one another.

Comparative sensory evaluation were performed on the ogiri produced from locust beans, fluted pumpkin and melon seeds as shown in table 3. The samples were evaluated for taste, colour, texture, aroma and overall acceptability. Ogiri produced from fluted pumpkin and melon seeds were more preferred by the panellists in all the sensory attributes evaluated. This implied that, the dependant on locust bean seeds for the production of ogiri can be reduced with the use of other underutilized seeds that are suitable for the production of ogiri.

Conclusion

Condiments are made from protein based foods and oil-seeds in which ogiri is included and seen as an aromatic condiment. Ogiri was processed from African locust bean, fluted pumpkin and melon seeds. The proximate composition and functional Properties were examined. The result obtained, showed a significant difference ($p > 0.05$) among the proximate and functional parameters examined. Ogiri produced from fluted pumpkin and melon seeds were preferred to the one processed from African locust bean seeds with overall acceptability of 80% for both seeds as against 50% observed for African locust bean seeds.

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