

# Comparative Analysis of the Nutritional and Mineral Compositions of Ogiri (local spice) produced from Melon, Fluted Pumpkin and Castor Oil Seeds

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Date of Submission: 25-02-2023

Date of Acceptance: 05-03-2023

## ABSTRACT

The comparative analysis of the nutritional compositions of Local spice (Ogiri) produced from melon, fluted pumpkin and Castor oil seeds was carried out using standard method AOAC (2000). Also the proximate and mineral compositions of the fermented substrates were determined. It was observed that the spice produced from castor oil contains the highest protein content (19.2%) when compared with the others, while the spice produced with fluted pumpkin has the highest amount of moisture (70.8%) which implies that it will have a lower shelf life compared with the others. It was observed that the Spice produced from melon has the highest calcium content of 143.0mg/100g and the highest phosphorous content of 480.2mg/100g. Additionally, the spice produced from melon still has a higher zinc contents (27.6mg/100g) than the other two. The spice produced from fluted pumpkin should be dried more to reduce the high moisture thus increasing its shelf life. Since the spice produced from castor oil seeds has the highest protein content (19.2%) it is highly recommended for preparing dishes for growing children. Since Ogiri Spice produced from melon seed has the highest of both calcium, phosphorus and zinc contents, it is recommended as the best of the three raw materials for the production of Ogiri spices with respect to maintaining a good health.

**Keywords:** Fermentation, Spices, Ogiri.

## I. INTRODUCTION

Food plants are the most important dietary sources for meeting the nutritional needs of majority of the population in Nigeria and over five hundred seasonings are made from plants. Some are

cultivated while others grow wild, Seasoning is sometimes used to add taste or flavor to food as condiment, herbs or spices (Kevin et al., 2021; Achi et al., 2021).

There are two main types of local seasoning used in Nigeria to prepare local dishes namely: fermented and non-fermented food seasoning. Fermented food seasoning are those seasoning which undergo traditional food processing methods that involves biochemical changes by microbes inherent in grains (Enujiugha et al., 2003).

The local spice commonly known in Eastern Nigeria as "Ogiri" is a flavoring paste produced mainly from fermented oil seeds such as fluted pumpkin seeds, melon seeds and castor oil seeds. The flavor property of Ogiri may be produced during fermentation or evolve as a result of the effect of heat on the amino-acid and fatty acids constituents during fermentation. (Robert et al., 2006; Iwuoha et al., 1999).

During fermentation the micro-organisms use the nutritional components of the seeds converting them into products that contribute to the chemical composition and taste of the spice.

Ogiri is used as a local seasoning to enhance the aroma of different types of local dishes made in Nigeria (Achi et al., 2021; Robert et al., 2006).

The local spice called Ogiri is both rich in amino acids and a good source of energy. Fermentation is a metabolic process in which an organism acts on the substrate to convert sugar.

Fermentation also has an effect on the proximate composition of Ogiri. And after the fermentation the nutritional and mineral

composition of the Ogiri spice is likely to change and affect the quality of the resulting spice. Hence this paper aims at comparatively analyzing the nutritional and mineral compositions of local spices (ogiri) from melon, fluted pumpkin and castor oil seeds (Enujiugha et al., 2003).

In Nigeria a lot of artificial seasoning are used as spices to make dishes such as maggi cubes and monosodium glutamate. Monosodium glutamate has been fingered as being responsible for brain lesions, obesity and other health conditions when consumed (Enujiugha et al., 2003; Okafor et al., 2007).

This work will also help encourage reduction in the intake of artificial seasoning thus promoting healthier feeding habits in our society.

## II. EXPERIMENTATION

Fresh fluted pumpkin seeds, melon seeds and castor oil seeds were obtained from Eke-Ukwu

market in Owerri. They were cleaned, and washed to remove dirt. The castor oil seeds were dehulled. 100g of each of the three samples were boiled and subjected to fermentation as follows. 100g of each sample was boiled for 20 minutes in a 250ml beaker heated by a heating mantle. Each sample was allowed to cool for 3 hours after which they were drained using a Whatman filter paper. Each of the resulting paste was wrapped with a nylon airtight material and stored in a cupboard for 6 days to induce anaerobic fermentation. On the 7th day the samples were removed from the nylon materials, ground into paste and subjected to laboratory analysis. The three fermented and ground samples were analyzed for percentage protein, moisture, carbohydrates, fiber, lipid, and ash content using the AOAC (2000) method. They were also analyzed for phosphorus, calcium and zinc using the AOAC (2000) method.

## III. RESULTS AND DISCUSSION

Table 1: Proximate Composition Of Fermented Ogiri Spices

Nutrients	Melon Seed	Fluted Pumpkin Seds	Castor oil Seed
% Protein	17.3	10.2	19.2
% Moisture	40.8	70.8	30.4
% Carbohydrate	7.4	18.0	14.6
% Fiber	2.9	3.4	4.8
% Lipid	29.3	14.4	27.7
% Ash Content	2.3	1.7	3.3

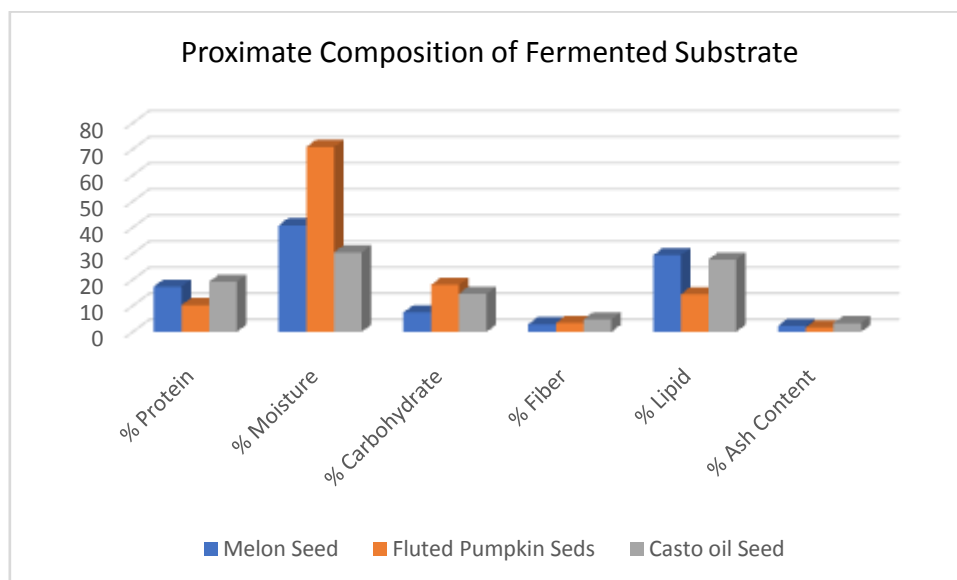


Chart 1 Proximate Composition of Fermented Ogiri Spices

Table 2: Mineral Composition Of Fermented Ogiri Spices

Nutrients	Melon Seed	Fluted Pumpkin Seds	Casto oil Seed
Phosphorus	480.2	373.7	428.0
Calcium (mg/g)	143.0	122.6	130.2
Zinc (mg/g)	27.6	27.1	21.4

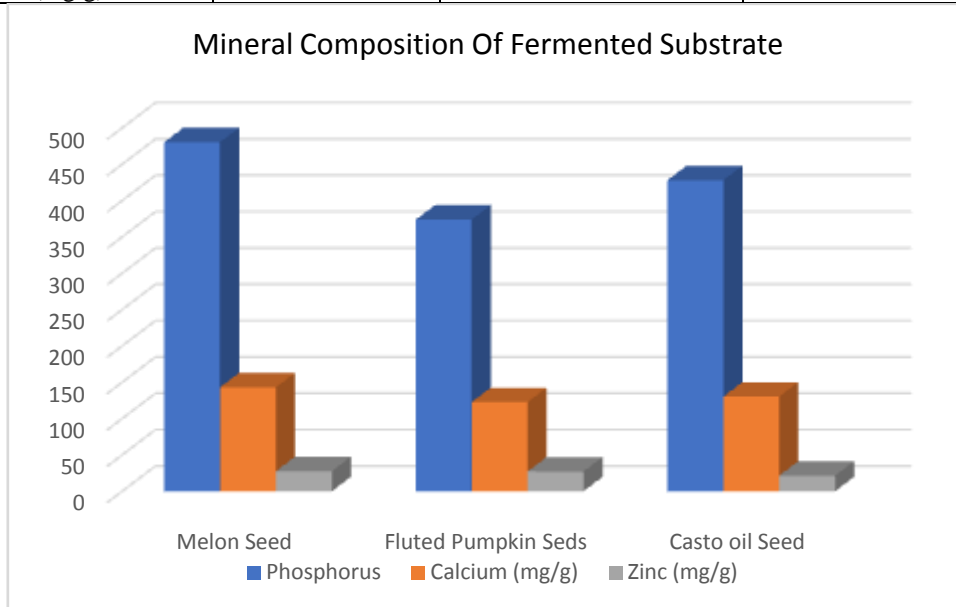


Chart 2: Mineral Composition Of Fermented Ogiri Spices



Figure 1: Ogiri spice produced from melon seed



Figure 2: Ogiri spice produced from fluted pumpkin seeds



Figure 3: Ogiri spice produced from castor oil seeds

From table 1 it is observed that the spice produced from castor oil seeds contains the highest protein content (19.2%) when compared with the others. This could be attributed to its inherent high protein composition. The spice produced with fluted pumpkin seeds has the highest amount of moisture (70.8%) followed by that produced from melon (40.8%) and then castor oil (30.4%). This implies that the spice produced with pumpkin seeds will have lower shelf life compared with the others.

From table 2 it can be observed that Ogiri Spice produced from melon has the highest calcium content of 143.0mg/100g. The human body uses calcium to build and maintain healthy bones, heart, muscles and nerves. Calcium also aids in fighting cancer, diabetes and high blood pressure. Calcium rich diets also protects the body against insomnia, fatigue and dizziness (Gabriela et al., 2019).

Also from table 2 it is shown that Ogiri Spice produced from melon seeds has the highest phosphorous content of 480.2mg/100g. The principal role of phosphorus in the human body is to form and maintain healthy bones and teeth. It also helps to control carbohydrates and fats intake. Phosphorus is also a building block for proteins DNA and RNA. It is also indispensable for the metabolism of vitamin D, iodine and magnesium (Mona et al., 2014).

Additionally, ogiri spice produced from melon seeds still has a higher zinc contents (27.6mg/100g) than the other two. A healthy amount of zinc is needed in the human body for the maintenance of a strong immune system. It facilitates the healing of wounds and acts as an antioxidant. Zinc is also critically needed in childhood growth and development (Debjit et al., 2010).

#### IV. CONCLUSION

The results revealed that Ogiri produced from castor oil seeds has higher values of protein, fiber, ash, and appreciable quantities of the

other nutrients and should be consumed very often since it is highly packed with nutrients compared with the other two.

The spice produced from fluted pumpkin seeds should be dried more to reduce the high moisture thus increasing its shelf life.

Since the spice produced from castor oil seeds has the highest protein content (19.2%) it is highly recommended for preparing dishes for growing children.

In addition, since Ogiri Spice produced from melon seed has the highest of both calcium, phosphorus and zinc contents, it is recommended as the best of the three raw materials for the production of Ogiri spices with respect to maintaining a good health.

#### COMPETING INTEREST

Authors have declared no competing interest exist.

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