

NUTRITIONAL COMPOSITION, PROXIMATE ANALYSIS AND ACCEPTABILITY OF SELECTED INDIGENOUS FOODS CONSUMED AT TWO ECO-DESTINATIONS IN ONDO AND EKITI STATES

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ABSTRACT

The study assessed the nutritional composition, proximate analysis and acceptability of indigenous foods available and consumed in Idanre and Ikogosi eco-destinations located in Ondo State and Ekiti State, Southwest, Nigeria respectively. A visit was paid to the host communities of the tourism centres in each of the State. Key informant interviews were conducted to know foods that were peculiar and indigenous to the host communities. Then, these foods recipes were collected within the locality of the community, prepared and presented to the tourists for test of acceptability using five hedonic scales. Portions of each food were sent to laboratory for analysis. The foods were subjected to proximate analysis. Descriptive statistic such as mean and standard deviation were used in the presentation of results. Findings show that black soups, Feregede and Amala ogede were the most acceptable foods by tourists from the two eco-destinations with acceptability scores of (4.650.459 vs 4.750.451). The result showed ample supply of nutrients such as Protein in black soups (18.35g/100g vs 22.08g/100g), Feregede (21.56g/100g), Pakala (14.35g/100g vs 15.35g/100g). Indigenous foods demonstrated a high level of acceptability by the tourists and are rich in nutrients.

Keywords: nutritional composition, indigenous foods, eco-destination, Idanre, Ikogosi

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INTRODUCTION

The basic requirements of life are food; clothing and shelter, of the three, foods come first. Its importance and role in sustaining human life cannot be over-emphasized. It is for this reason that Joint Food and Agricultural Organization/World Health Organization Committee on Nutrition stressed the importance of the general food, nutrition, and nutrition outlook in the world (FAO/WHO, 2021). Food is a necessity for human living. It is the major source from which the body derives its nutrients - the source of energy, builds body tissues, repairs worn out tissues and nourishes the body. The consumption of food is as good as food itself because the rate at which people eat would determine how vibrant they would be in their day-to-day activities in order to satisfy their social, economic, psychological needs (Tenison, 1980 cited in Awojobi *et al.*, 2014). Good nutrition is a basic human right if a society is to have a healthy population that can promote development.

In developing countries, one of the ways of achieving this is through the exploitation of available local food ingredients in the formation of nutritional adequate diet which incorporates essential food groups (Mbhenyane, 2017). Nigeria in her diversity has people of diverse culture with peculiar foods/cuisines that can be regarded to as regional favorites.

Nigeria is a multi-cultural society endowed with diverse traditional vegetable soups which are indigenous to different ethnic groups and consumed along with traditional dietary staples, obtained from cassava, yam, cocoyam, sweet potatoes, plantain, millet, rice and maize (Ndulaka *et al.* 2014). According to Akinola *et al.* (2020), indigenous food is defined as foods originating in a specific bio-region in conjunction with foods that were introduced into the country and are now recognized as indigenous due to their being integrated into the local food culture. Mbhenyane (2017), refers to indigenous foods as non-commodities (something for which value is not recognized) that form part of a large portfolio of

genetic, agroeconomic, economic, social, and cultural factors.

Nigeria has such a diversity of people and cultures that is demanding to prize one national dish above the other. Each culture has its own favourite cuisine that depends on their customs, tradition, and religion. Food (cuisines and dishes) plays important roles in the structure of locations and tourism destinations. Climate, culture, and history of a region form its food characteristics since foods are considered as a subset of cultural tourism (Lin *et al*, 2021).

Tourism is a vehicle for economic growth and job creation but it is an under-developed opportunity in Nigeria. Nigeria is vastly endowed with natural resources that attract tourists from all over the world. It has much cultural heritage that has good characteristics features passed down from generation to generation through mindful conservation (Akinola *et al*, 2020). In respect to food diversity in Nigeria, various foodservice or hospitality outlets such as hotel, restaurants, fast-food restaurants, bars and lots of others have been established to provide different foods in different places and at different times to satisfy people's hunger and take care of their gastronomic wants. As aforementioned, a lot of food are served in foodservice outlets, these include: intercontinental dishes such as pasta, egg meals, pottages, different types of soups, salads, fillets, pastry products etc., local foods such as *iyen*, *amala*, *eba*, *lafun*, *fufu* (peculiar to the Yorubas), *akpu*, *ji-akpu*, *gari*, *osikapa*, *ede*, (peculiar to the Ibos), *ema*, *usi* (peculiar to the Benins), *suya*, *kilishi*, *tuwo* (peculiar to the Hausas), these foods exist in different varieties, and are served with varieties of soup peculiar to the people and their culture (Awojobi *et al*, 2014).

Relationship exists between people's location, culture, indigenous cuisines, food security and nutrition. There is a huge concern on the underutilization and neglect of indigenous foods that can be of value to societies in terms of nutritional food security, income generation and medicinal value (Agulanna, 2020). Food is gaining increasing recognition as a destination attraction. The product portfolios of a destination "consist of a variety of tangible and intangible goods and services. Food (including beverages) can form one of the most important of these elements. It can act as either a primary or secondary 'trip motivator' (Perez Galvez *et al*, 2017). Among other things, local food can build a local brand identity that attracts tourists and, at the same time, enhances local pride and employment opportunities for locals (Giampiccoli and Mnguni, 2019).

The locals often undervalued the tourism potential of their indigenous food and local cuisine in terms of nutritional values. Furthermore, "local food in the form of regional cuisine is rarely presented as an important resource in publicity material and promotional messages prepared for mainstream tourism" (Giampiccoli and Mnguni, 2019). Stakeholders need to collaborate in tourism and hospitality to develop and promote local cuisine.

Studies have confirmed that there is an interrelationship between diets, food habits and micronutrient deficiency diseases (Olayiwola and Okhiria, 2012; Agulanna, 2020). Thus, there is urgent need for investigation of the nutrient composition of traditional indigenous foods consumed in Nigeria (Olayiwola and Okhiria, 2012). As modern dietary pattern is considered part of the causes of chronic diseases, consumption of healthy traditional or indigenous foods is believed to reduce the incidence of non-communicable diseases.

Local food has been indicated as a contributor to various aspects of development and sustainability. Thus, local crop species can be instrumental in enhancing local food production and community empowerment while local food varieties would enhance the brand of the local community area. In other words, the local food builds a 'brand identity' that will be a tourism attraction and further generate local pride, and create employment opportunities for local people. Many rural communities have access to indigenous and traditional foods that are rich in micronutrients, which are likely to serve as a long-term strategy to eliminate food insecurity and contribute to nutrient requirements. These include indigenous fruits, vegetables, tubers, and roots. There is scarcity of data on nutritional and economic value and practices of indigenous foods in tourist centres in Nigeria. Comprehensive food composition data is a critical step and important for the promotion and inclusion of indigenous foods in daily diets. Information on available indigenous foods in Idanre and Ikogosi eco-tourist destinations would be useful for the education of the public (especially potential tourists) to have first-hand information pertaining to foods and nutrition while also contributing to improve their nutritional status. Finding from this study might help in the promotion of indigenous foods consumption by the tourists in Idanre and Ikogosi eco-destinations, for their health and nutritional benefit, by increasing knowledge of the food value of indigenous foods through nutrition education.

The study aims to assess the nutritional composition

and acceptability of indigenous foods available and consumed in Idanre and Ikogosi eco-destinations located in Ondo State and Ekiti State, Southwest, Nigeria.

MATERIALS AND METHOD

Study Area

The study was conducted in South-western Nigeria, which is predominantly populated by the Yoruba people with different tribes and diverse cultures and dialects; the residents are bounded together by the same Yoruba language. They share the same food culture but have diverse dishes and dietary patterns. The locations for the study are:

- i. Idanre Hills in Idanre Town, Ondo State, Nigeria.
- ii. Ikogosi Warm Spring Resort in Ikogosi Town, Ekiti State, Nigeria.

Idanre Hills

Idanre town is located 20km South of Akure the Capital city of Ondo state. The town is a notable tourism site because of the Hills which occur in a chain forming a ridge with serrated outline. Idanre hills constitute one of the highest elevated parts of South-western Nigeria (Figure 1). Idanre lies between longitudes 07°00' and 7°10' and latitudes 5°00 and 5°13. It covers an estimated area of 432sq km. Idanre town is about 20 minutes' drive from Akure, the capital city of the state. The major occupation of the local people is farming, boasting of Cocoa, a major cash crop in Nigeria.

Idanre hills (Called *Oke Idanre* in Yoruba language) consist of high plains with spectacular valleys interspersed with inselbergs of about 300m above sea level (UNESCO, 2007). Its physical attributes include Owa's palace, shrines, old court, Agboogun footprint, thunder water (*Omi Aopara*) and burial mounds and grounds. It has varieties of flora and fauna species. The hills contain very important bio-physical and land form features whose interaction with the physical features has created an enduring cultural landscape within the setting (Ojo, 2014). The terrain of Idanre town is gently undulating with a lot of mountainous areas, especially the *Alade* community. Annual mean rainfall is between 1400 - 2000 mm. The wet season spreads over eight months, from April to November while the dry season spreads over the remaining four months, from December to March. The temperature is fairly moderate and ranges between 21°C and 30°C depending on the time of the year. The Idanre hill area covers about 50 km radius and takes a total of three days to be thoroughly transverse (Ogunjinmiet *et al.*, 2019)

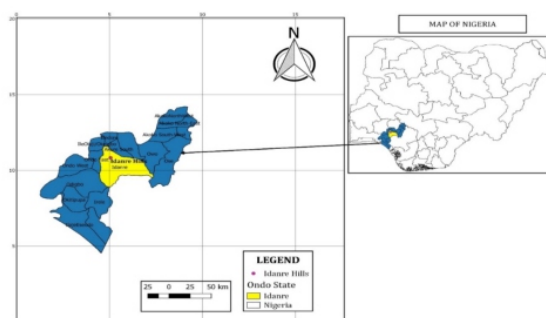


Figure 1: Map of Ondo State showing Idanre local Govt. Area

Ikogosi Warm Spring and Resorts

Ikogosi Warm Spring Resorts is in Ikogosi Ekiti in Ekiti West Local Government Area of Ekiti State in Nigeria. In the heart of Ikogosi, a small, quiet town with rich, local customs, in the Western part of Ekiti State, lies a warm spring which has now catapulted Ikogosi-Ekiti to national and international limelight. The warm and cold springs of Ikogosi originated from a proximity, come to a meeting point, and flow onward together with each spring retaining its thermal identity. It represents uniqueness and is the first of such occurrence in the world. The warm spring has a temperature of up to 70°C at the source and 37°C after meeting to cool spring. The meeting point of the warm and cold springs is a unique attraction to tourists.

The area covered by this resort centre is about 31.38 km and it is highly protected from erosion by tall and evergreen trees. These trees also serve as a sort of canopy under which tourists could stay during the dry season and sunny days. The undulating topography of the entire tourist centre and the symmetry of the surrounding hills add more to the aesthetic beauty of this centre. There is a pass that cuts across the tourist centre to the equally popular Arinta water fall at Ipole Iloro, a few Kilometres to the Warm Spring. Ikogosi Warm Spring is about 55km from Akure, the Ondo State Capital. Ikogosi is in Ekiti West LGA which is about 30km from Ado-Ekiti, the Ekiti State Capital. Ikogosi Warm Spring and Resorts receives thousands of local and international tourists annually.

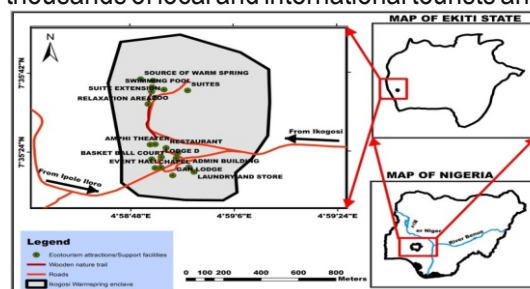


Figure 2: Map of Nigeria showing Ikogosi

Reconnaissance Survey

Prior to the research, a familiarization visit was made to the two Eco-destinations' host communities (Idanre and Ikogosi) for the purpose of getting familiar with the sites and to ascertain the various indigenous foods available and consumed by the host communities.

Identification of indigenous Foods consumed at the eco-destination

Preliminary information's were collected on indigenous foods consumed at the eco-destinations (Idanre & Ikogosi) using Key informant interview (KII). A Key informant interview schedule was prepared to guide the questions. Key informants included elders and old women, and herb sellers that are indigene of the communities. The information elicited from the key informant interview include whether there was any food that are indigenous to the communities (Idanre & Ikogosi), what are these foods and their method of preparation. The responses are presented in table 1. Each of the community key informant interviewee mentioned more than seven (7) foods that are indigenous to them.

Selection of indigenous foods and preparation

Out of the indigenous foods mentioned by the key informant interviewee from each of the community (Idanre & Ikogosi), a simple random sampling method was used in selection of four (4) foods each from the communities and the ingredients were procured at the market within the host communities. The food sample was prepared at the study area.

Preparation of selected indigenous food consumed in Idanre

Preparation of porridge Lima beans (Pakala)

The lima beans (pakala) used was cleaned and sorted to remove extraneous materials and damaged seeds. It was boiled for one hour after which the water was discarded and fresh new water was added for cooking for another one hour. This process was repeated for the next three days, then it was pounded using mortar and pestle. Pepper, onions, salt and palm oil were added and it was cooked for 1 hour.

Preparation of Epipò

The yam was peeled, washed and cooked for 7 minutes. It was then sundried for eight (8) days. It was pounded with mortar and pestle. It was soaked till soft consistency was obtained. It was cooked and

sauce containing crayfish, dry fish, meat stock was added and stirred. It was cooked for another 25 minutes. Sample was allowed to cool for analysis.

Preparation of Idanre black soup

The soup ingredients as listed in table1 were prepared as follows. The leaves were plucked and washed. Pepper, onions and tomatoes were added and grinded together with the *eragiri* until a smooth texture was derived. The mixture was poured into the pot, small quantity of palm oil, including the washed meat and dry fish and seasoning were added. It was covered and allowed to cook for 60 minutes. It was stirred and allowed to steam.

Table 1: List of ingredients for Idanre black soup

Ingredients	Quantity(g)
Marugbo leaves	250
Pepper fruit leaves/ewe Igbee	60
Alligator Pepper leaves/ewe Itaye	60
Black pepper leaves/ewe Ighere or Uziza	60
African Basil, scent leaf or Efinrin	120
Oven-Grilled fish	150
Ewe ailu or secamone	7.5
Akintola/ Christmas bush	15
Tumeric	10
Cottonseed powder	20
Cooked Beef/Chicken/Assorted	200
Dried Shrimps	10
Onion	50
Palm oil	60
Fresh hot pepper (Ata Rodo)	20
Fermented oil seeds (Locust bean)	60
Seasoning Cube	10
Salt to taste	2

Field Survey (2023)

Method of preparation of Black soup

- Fish and meat were washed, cut into sizes, boiled about 10mins and kept for use
- The back (skin) of the turmeric is scrapped off, washed and cut into pieces
- Leaves were thoroughly washed i.e. Marugbo leaves and other leaves according to preference thoroughly
- Fresh pepper and onion were added and blended to smoothness.
- The meat, *ponmo* or dried fish was washed thoroughly, put in a pot, with sliced onion, seasoning, salt to taste and boiled for 15 minutes
- Blended leaves and other ingredients were added in boiled meat, together with smoked fish, seasoning and water appropriately

- The calabash nutmeg was broken into two; the content was removed and roasted a little.
- All the ingredients, including scent leaves except for beef, fish and oil were grinded to a paste with kitchen blender
- The blended ingredients were poured into a pot and placed on a heat source (stove) at 70°C.
- Palm oil and stock fish were added to the paste.
- The soup was covered and was allowed to boil for 15 (fifteen) minutes
- After fifteen minutes of boiling, beef and fish were added to the soup.
- Water (200ml) was added and boiled for twenty-five (25) minutes
- It was removed from stove
- About 500ml of the soup was drawn from the 1litre yield of the soup, blended and allowed to cool.

Preparation of Amala Ogede

The plantain was peeled and sundried for four (4) days. It was milled into flour. Over ripe plantain was peeled and grinded using mortar and pestle. The overripe plantain and the flour were mixed together with water. Ingredients such as eggplant, condiments and fish were added. It was dished inside the leaves and steamed for 50 minutes. Sample was allowed to cool for analysis. Portion of the food was sent immediately for laboratory analysis.

Preparation of selected indigenous foods consumed in Ikogosi

Preparation of Epa

The cocoyam was peeled, washed and cooked for 7 minutes. It was then sundried for eight (8) days. It was pounded with mortar and pestle. It was soaked till soft consistency was obtained. It was cooked and sauce containing crayfish, dry fish, meat stock was added and stirred. It was cooked for another 25 minutes. Sample was allowed to cool for analysis.

Preparation of porridge Lima beans (Pakala)

The lima beans (pakala) used was cleaned and sorted to remove extraneous materials and damaged seeds. It was boiled for one hour after which the water was discarded and fresh new water was added for cooking for another one hour. This process was repeated for the next three days. Then it was pounded using mortar and pestle. Pepper, onions, salt and palm oil were added and it was cooked for 1 hour.

Black soup

Preparation of the soups (Ikogosi black soup)

The soup ingredients as listed in table 2 were sorted and each of the ingredient was weighed and washed to remove the dirt, the ingredients were grinded together and mixed with water and put on the gas cooker, after 5 minutes of boiling, palm oil, salt and maggi were added and allowed to cook for 50 minutes.

Table 2: List of ingredients for Ikogosi black soup

Ingredients	Quantity (g)
Cotton seed	100
Calabash nutmeg	20
Climbing black pepper (lyere)	15
Turmeric	15
Scent leaves (shredded)	120
Garlic	15
Ginger Powder	20
Dried pepper	15
Palm oil	15
Stock Fish	60
Mashed bark of mahogany tree (isukusu)	200
Water	300
Erima (octomeles <i>sumatrana</i> seed)	50
Beef (fat free)	100
Fish	200
Total volume of the soup after cooking	1000ml

Field Survey (2023)

Method of preparation of black soup (Ikogosi black soup)

- The cotton seeds were sorted and winnowed to remove stones and pebbles
- Fish and meat were washed, cut into sizes, boiled about 10mins and kept for use
- The back (skin) of the turmeric was scrapped off, washed and cut into pieces
- The calabash nutmeg was broken into two; the content was removed and roasts a little.
- All the ingredients, except fish, scent leaves and oil were grinded to a paste with kitchen blender
- The blended ingredients were poured into a pot and placed on a heat source (stove) about 70°C
- Palm oil and stock fish were added to the paste.
- The pot was covered and allowed to boil for 15 (fifteen) minutes

- After fifteen minutes of boiling, beef and fish were added to the soup.
- Shredded scent leaves were added to the boiling soup
- Water (400ml) was added and allowed to boil further for twenty-five (25) minutes
- It was removed from stove
- Exactly 500ml of the soup was drawn from the 1litre yield of the soup, blended and allowed to cool.

Feregede

Preparation of African Yam bean (Feregede)

The African yam beans (Feregede) used was cleaned and sorted to remove extraneous materials and damaged seeds. It was boiled for 6 hours. Ingredients such as pepper, salt and palm oil were added.

Assessment and Preparation of Food Samples for Analysis

Food sample of each cooked dishes obtained from the study community after proper preparation before acceptability evaluation was collected and placed in sealable food containers and sent to the central chemical analysis laboratory of the college of sciences, research & extension unit of the Afe Babalola University, Ado-Ekiti, Ekiti State for chemical analysis of the indigenous foods.

Evaluation of the acceptability level of the indigenous foods by the Tourists

A structured questionnaire was used to collect information from thirty (30) tourists at each Eco-destinations on the acceptability of the selected indigenous foods. The food samples were coded as A to D and presented to the panelists who were the tourists. The panelists were briefly educated on the purpose of the study. The tourists were given a bottle of potable water to rinse their mouth after each tasting. Each of the food sample was served at the same temperature (15°C) eaten with tea spoon. The tourists evaluated the food for flavour, taste, appearance and general acceptability using the five-point hedonic scale where the highest score was 5 and 1 was the least score in line with the method described by Nnam (2002). The extent to which food sample was liked was expressed as: like very much (5), like moderately (4), like slightly (3), dislike slightly (2), dislike very much (1).

Procedure for Chemical Analysis of samples

Proximate Analysis

Prior to analysis, each food samples were homogenized using an electric blender and food samples was analysed using standardized assay methods. The proximate analysis involved several repeated analyses of the samples to determine their nutrient composition; it estimates moisture content, ash content, crude fiber, crude protein, fat content and carbohydrate using the standard procedures of the Association of Official Analytical Chemists AOAC (1990).

Statistical Analysis

The Statistical Package for Social Sciences (SPSS, Version 23) software was used to analyse data generated from the chemical analysis and acceptability evaluation. The results were expressed as mean \pm standard deviation of sample triplicate using one-way analysis of variance (ANOVA). Significant means was separated using Duncan's New Multiple Range Test (DNMRT) and differences were considered significant at $p < 0.05$.

RESULTS

Table 1 shows the various indigenous foods available and consumed in the host communities.

Table 1: Indigenous foods available and consumed in the study communities

S/N	Idanre	Ikogosi-ekiti
1	Amala ogede	Iyan (pounded yam)
2	Pakala	Black soup
3	Black soup (Obetadudu)	Otili
4	Epipo (dry yam)	Kokondo
5	Owogho soup	Papala
6	Okro soup with difference	Owowo (ogede ominmin)
7	Feregede	Epa (dry cocoyam)
8	Iyan (pounded yam)	Feregede

Field Survey (2023)

Table 2: Evaluation acceptability level of the indigenous foods consumed in Idanre,

Samples	Flavour	Appearance	Taste	General Acceptability
Black soup	4.50 \pm 0.509 ^a	3.50 \pm 1.137 ^d	4.83 \pm 0.379 ^a	4.65 \pm 0.459 ^{ab}
Epipo	3.67 \pm 0.758 ^c	4.00 \pm 0.587 ^a	3.50 \pm 0.777 ^c	3.83 \pm 0.699 ^c
Pakala	4.00 \pm 0.587 ^b	3.50 \pm 0.974 ^d	4.83 \pm 0.379 ^a	3.83 \pm 0.379 ^c
Amala-ogede	4.50 \pm 0.509 ^a	3.67 \pm 1.626 ^c	4.83 \pm 0.379 ^a	4.67 \pm 0.479 ^a
Total	4.17 \pm 0.690 ^b	3.92 \pm 1.192 ^b	4.50 \pm 0.767 ^b	4.25 \pm 0.664 ^b

Values with different superscript in each column are significantly different ($P < 0.05$)

Field Survey (2023)

Evaluation acceptability level of the indigenous foods consumed at Idanre

The evaluation of the acceptability of the indigenous foods consumed at Idanre is presented in table 2 using means and standard deviation. Majority of the tourists liked the flavour and the taste of the black soup very much while the appearance was 'liked slightly' with an average score of 3.501.137. Acceptability was very high among the tourists with a score of 4.650.459 out of 5. Majority of the tourists slightly liked the flavour (3.670.758) and the taste (3.500.777) of the Epipo, and moderately liked the appearance (4.000.587). The food was slightly accepted (3.830.699) among the tourists. In the same vein, majority of the tourists slightly liked the appearance (3.500.974) of the Pakala, and moderately liked the taste (4.830.379) and flavour (4.000.587). Pakala was slightly accepted among the tourists (3.830.379). Majority of the tourists liked the flavour (4.500.509) and the taste (4.83 0.379) of the Amala-ogede very much while the appearance was liked slightly with an average score of 3.671.626. Acceptability was very high among the tourists with a score of 4.670.479 out of maximum of 5. It was the most accepted indigenous food in ranking among the tourists in Idanre.

Evaluation acceptability level of the indigenous foods consumed at Ikogosi

Table 3: Evaluation acceptability level of the indigenous foods consumed in Ikogosi

Samples	Flavour	Appearance	Taste	General Acceptability
Black soup	4.60±0.519 ^a	3.54±1.127 ^{cd}	4.73±0.372 ^b	4.75±0.451 ^a
Epa	3.67±0.238 ^e	3.90±0.513 ^a	3.70±0.767 ^d	3.73±0.689 ^c
Pakala	3.80±0.487 ^d	3.50±0.914 ^d	4.53±0.379 ^c	3.85±0.389 ^c
Feregede	4.55±0.519 ^b	3.57±1.526 ^c	4.84±0.279 ^a	4.77±0.479 ^a
Total	4.15±0.610 ^c	3.62±1.182 ^b	4.45±0.767 ^{cd}	4.28±0.654 ^b

Values with different superscript in each column are significantly different ($p < 0.05$)

Field Survey (2023)

Table 3 shows the acceptability evaluation of the indigenous food consumed at Ikogosi. Majority of the tourists liked the flavour (4.600.519) and the taste (4.730.372) of the black soup very much while the appearance was liked slightly (3.541.127). Acceptability was very high among the tourists (4.750.451). Majority of the tourists slightly liked the flavour (3.670.238), taste (3.700.767) and appearance (3.900.513) of Epa. The food was slightly accepted among the tourists with a score of 3.730.689 out of a maximum score of 5. Similarly, Majority of the tourists slightly liked the appearance (3.500.914) and flavour (3.800.487) of pakala but

moderately liked the taste (4.530.379). Pakala was slightly accepted among the tourists with a score 3.850.389 out of maximum score of 5. On the acceptability of Feregede (Africa yam bean), most of the tourists liked the flavour (4.550.519) and the taste (4.840.279). The appearance was slightly liked with an average score of 3.571.526. Acceptability was very high among the tourist with a score 4.770.479 out of maximum score of 5. It was the most accepted indigenous food in ranking among the tourist.

Proximate values of selected indigenous foods consumed in Idanre

Table 4 shows the proximate composition of indigenous foods [black soup, Epipo (dry yam porridge), Lima beans (Pakala) and Amala ogede (plantain pudding)] consumed in Idanre. From the table, Amala-ogede had the least (20.280%) moisture content while black soup had the highest moisture content (34.18%). Ash and fat content from the table show that Lima beans (Pakala) had the highest value of 4.23% and 10.61% respectively. Epipo had an ample amount of fibre (5.58%) while black soup had the highest content of protein (18.352±0.004^a). As expected, Epipo had the highest carbohydrate content, followed by pakala and Amala ogede with 42.73% and 42.736% respectively

Table 4: Proximate composition of indigenous foods consumed in Idanre

Proximate (%)	Black soup	Epipo	Pakala	Amala-ogede
Moisture	34.180±0.003 ^a	21.28±0.007 ^c	24.28±0.007 ^b	20.280±0.001 ^c
Ash	2.230±0.004 ^c	3.23±0.004 ^b	4.23±0.004 ^a	2.230±0.004 ^c
Fat	10.678±0.005 ^b	12.61±0.005 ^a	10.61±0.005 ^{bc}	5.618±0.005 ^c
Fibre	4.784±0.002 ^b	5.58±0.002 ^a	3.78±0.002 ^c	3.584±0.002 ^d
Protein	18.352±0.004 ^a	10.35±0.005 ^d	14.35±0.005 ^b	11.352±0.004 ^c
Carbohydrate	28.77±0.004 ^c	42.73±0.004 ^a	42.73±0.004 ^a	42.736±0.004 ^b

Values with different superscript in each row are significantly different ($p < 0.05$)

Field Survey (2023)

Proximate values of selected indigenous foods consumed in Ikogosi-Ekiti

Table 5 shows the proximate composition of indigenous foods [black soup, Epa (dry cocoyam porridge), Lima beans (Pakala) and Feregede (African yam bean)] consumed in Ikogosi. From the table Feregede (18.16%) had the least moisture content while black soup (29.87%) had the highest moisture content. The table shows that Lima beans (Pakala) and Epa had the highest value of ash (4.66%) and Fat (15.61%) respectively. The black soup had the highest (22.08%) protein content. As expected, Epa had the highest carbohydrate (44.75%) content, followed by pakala and Feregede with 43.73% and 42.89% respectively.

Table 5: Proximate composition of local foods consumed in Ikogosi-Ekiti

Proximate (%)	Black soup	Epa	Pakala	Feregede
Moisture	29.87±0.17 ^a	19.28±0.007 ^c	20.28±0.007 ^b	18.16±0.004 ^d
Ash	2.37±0.010 ^d	3.53±0.004 ^c	4.66±0.004 ^a	3.89±0.002 ^b
Fat	15.21±0.01 ^a	15.61±0.005 ^a	11.51±0.005 ^b	7.21±0.004 ^c
Fibre	9.86±0.011 ^a	6.18±0.002 ^b	4.38±0.002 ^c	6.29±0.004 ^b
Protein	22.08±0.01 ^a	10.65±0.005 ^c	15.35±0.005 ^b	21.56±0.002 ^a
Carbohydrate	20.62±0.02 ^d	44.75±0.004 ^a	43.82±0.004 ^b	42.89±0.009 ^c

Values with different superscript in each row are significantly different ($p < 0.05$)

Field Survey (2023)

DISCUSSION

The nutritional composition of indigenous foods from the eco-destinations

The nutritional composition of indigenous foods consumed in Idanre showed that ash content (which is a representation of mineral elements) was moderate ($< 4.23\text{g}$) in all the samples. *Epipo* had the highest values for fat content (12.61g), fibre (5.58g) and carbohydrate (49.73g), making it a good source of energy for daily activities and basal body metabolism. Black soup had the highest amount of protein (18.352g) and moisture (34.18%); this could be due to the addition of ingredients like meat, fish and stock fish in the recipe. Cotton seed and palm oil could be the reason for the appreciable fat content (10.678g). *Pakala* had the highest ash content (4.23g), while *Amala-ogede* had low values for all the nutrients except carbohydrate (42.736g).

In the second community, *Ikogosi-Ekiti*, the nutritional composition of the indigenous foods showed that black soup had high values for moisture, fat, fibre and protein. But its carbohydrate content (20.62g) was the lowest among the samples. Protein content was highest in *Feregede*, ash content was high in *Pakala*, while *Epa* had the highest content of fat and carbohydrate. These facts showed that the indigenous foods are rich in nutrients and promote good health, compared to consuming modern fast foods that are high in sodium and trans-fat which are harmful to health.

The acceptability of the various indigenous foods from the two eco-destinations

The acceptability of the various indigenous foods by the tourists was very high. The overall result shows that flavour and taste was the greatest drive for most of the tourists for the acceptability of the black soup in the two eco-destinations. The black soups and *Feregede* meal were accepted on the ground of the flavour and taste, their acceptability of the black soups based on these sensory parameters were

higher than any other foods sampled by the tourists. The reason could be that flavour and taste play a fundamental role in determining the acceptability of food and beverages by the consumers (Weijzen *et al.*, 2008). Flavour is complex stimulation of all chemosensory system because the brain blends all the information to a single perceptual gestalt. When a food enters the mouth, its taste provides vital information about nutrient quality and acceptability (Nnam, 2002). On the contrary, visually, all the food samples in the eco-destination were not totally accepted in terms of the appearance. The appearance most of the indigenous foods in this study were black or brown in colour and this appearance actually repealed the tourists and it was reflected in the score for the appearance in the overall assessment of the food. Mojet (2004) in his study opined that appearance is key to food acceptability. Other foods from the two communities were on the average score in all parameters and general acceptability. They were slightly accepted. These foods include *Epipo*, *Pakala* and *Epa*, *Papala* in Idanre and *Ikogosi* respectively. The black soups from the two communities, *Amala ogede* and *Feregede* (Africa yam bean) had a strong acceptability rating by the tourists and had a potential if incorporated as local dish in the food menu of tourists visiting the tourist centre in the communities thereby increase the economic value and utilization of the crops.

Proximate values of selected indigenous foods from the two eco-destinations

In this study, the proximate composition of the foods under investigation had an appreciable amount of nutrients, fibre and moisture contents. The black soups had a high moisture content. The values were higher than 11.55% reported by Ojinnaka *et al.*, (2016) on comparative study of the nutrients and anti nutrient composition of the seeds and leaves of *Uziza* (*Piper Guineense*) Soup. The result from this study was consistent with the results recorded by Ajayi *et al.*, (2014) and Asaolu *et al.*, (2012). The moisture content of any food is an index of its water activity and is used as a measure of stability and susceptibility to microbial contamination (Desai & Salunkhe, 2011). The protein content of all the food samples was appreciable. None of the food samples had less than 10% of protein content. The black soups were exceptionally high with protein content within $18\text{--}22\text{g}/100\text{g}$ of food sample. The high protein levels obtained in this study could be due to fish and meat

added during preparation. Also, this is an indication of the potential importance of these soups for food and feed formulation. Protein has been proved to be an essential ingredient for the survival of human beings and animals (Hunel *et al.*, 2012). The amount of proteins obtained in this traditional soup is considerably high compared to the protein levels in some traditional soups consumed in Nigeria (Enujiugha & Agbede, 2000). Consumption of traditional or indigenous foods such as the ones under this investigation has a great tendency to improve the nutritional status and food security and prevent protein malnutrition among consumers. One of the special attributes of indigenous foods is the sparing use of fat and oil in their preparation. The crude fat contained in all the indigenous foods was less than 16g/100g. Amala ogede and Feregede was less than 10g/100g. Nwofia *et al.*, (2012) have earlier reported that low lipid concentration in indigenous soups and food materials indicates that the lipids are mobilized and stored in the ingredients thereby making it a good source for people suffering from obesity. Consumption of low-fat diet or foods is a good way to promote health among obese individuals. The ash content of food substance is an indication of the mineral element content of food (Gomes *et al.*, 2013). In this study, all the indigenous food under investigation had an appreciable amount of ash. The crude fiber, although it's not a nutrient per se but has a physiological and therapeutic function (Bello *et al.*, 2008). Crude fibre is the part of food that is not digested by human but has a great impact on intestinal tract function and health of an individual. It increases stool bulk and decreases the time that waste materials spend in the gastrointestinal tract. Fiber helps in the maintenance of human health and has been known to reduce cholesterol level of the body (Bello *et al.*, 2008; Hunel *et al.*, 2012). Carbohydrates are the most abundant biological molecules and play important roles in the body as sources of energy as well as provision of structural materials (Hunel *et al.*, 2012). The results of this study indicated that all the indigenous food possesses moderate amounts of carbohydrate and these can provide accessible fuel for physical performance and regulate nerve tissues (Onwuka, 2005).

CONCLUSION

It was observed that the two eco-destinations in the southwest Nigeria have abundant foods that could be exploited if properly processed but it rather going into

extinction. The study had shown the disposition of tourist to indigenous food consumption. From the acceptability perspective of the tourists, there is high propensity for acceptance of the foods. Blacksoups, Amala ogede and Feregede top the list of highly acceptability foods from the two eco-destinations under investigation by the tourists with a mean score more than 4.5 out of a maximum score of five. Other foods were never rejected as well but were slightly liked by the tourists. The study had also shown that indigenous foods are rich in nutrients and possess significant health benefits. All the foods and soups demonstrated a low level of sodium and saponin which make the foods an excellent choice for not just the tourists but also the community dwellers.

Recommendation

The following recommendations were made based on the findings of this study.

The public should be sensitized to consume the indigenous foods because they are rich in mineral elements, which protect the body from diseases, and they play vital roles in homeostasis, and other metabolic processes.

Due to its high protein content and other nutritional composition (fibre, carbohydrate, fat), the indigenous foods should be advertized to foreign and local tourists. An added advantage is that the nutrients are from natural organic food materials, which eliminate the problem of free radicals.

The foods were well accepted by the tourists as seen from sensory evaluation of taste and appearance; as such catering and food outlets at the two eco-destinations should endeavor to include the food on their menu list, alongside the continental dishes, to make it available for tourists' consumption.

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