

A SENSORY EVALUATION AND NUTRITIONAL CONTENTS OF SELECTED LOCAL DISHES IN (RIYE) OGUN STATE OF NIGERIA.

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Abstract

1. The eating tradition of every country and culture are the result of millennia of history. Geographical location and climatic conditions play a predominant role in the growing, harvesting and availability of food product influencing the food habits of the ethnic populations. (Finch C.F & Cracknell H.L, 1997). *The study evaluated the proximate composition and sensory properties of selected local dishes in Ogun state. The specific objectives are to know the level of acceptability of the local dishes using organoleptic evaluation of the dishes, to know the nutritional content of the dishes using proximate analysis and to know the adequacy of the local food. A well-structured sensory evaluation sheet was developed to elicit information from twenty taste panelists and chemical composition of each food were determined. The result obtained showed that moisture content has the lowest value of 59.41% in sample A (Ofada rice/Stew) and highest value of 81.22% in (Ota/Eko). Crude fibre 4.51% is the highest value for sample D (Ebiripo/Egusi) and 2.21% is the lowest in sample E (Ota/Eko). Protein content ranged from 5.41-10.91%, highest value of 10.91% in sample E (Ota/Eko) and lowest value of 5.41% was recorded in sample A (Ofada rice/Stew). Fat content ranged from 2.42 - 8.54%, sample D (Ebiripo/Egusi) had the highest followed by sample B (Ikokore), sample A (Ofada rice/Stew) and lowest value recorded in sample E (Ota/Eko). Carbohydrate content ranged from 2.67 -26.36%, sample A had the highest value and sample E had the*

lowest content. All the samples in this present research work have significant differences of ($p < 0.05$) in the nutritional composition in terms of moisture, ash, fiber, protein, fat and carbohydrate content and this could be attributed to the different food stuffs used. However, this showed that there was no evidence of difference in nutrient quality between organically tasted food stuffs. Most (65-70%) of the taste panelists likes the appearance and colour of sample E (Ota/Eko), most (60%) of the taste panelists like the taste of sample A, most (60%) of the taste panelists like the texture and aroma of sample E. The overall acceptability of the dishes tasted shows that 70% of the respondent accepted sample A and E. No statistical differences ($p < 0.05$) were found with the values ranging from 7.45 to 8.70 for colour, appearance, taste, aroma, texture, and overall acceptability among the products respectively. In conclusion the nutritional composition of local dishes consumed in Ogun state has shown in this study are good sources of carbohydrate, moderate sources of protein, fat and fibre. There is urgent need for Nigerian to put in place food composition table for local foods especially those rich in protein, carbohydrate, crude fiber and vitamins. Government needs to help increase farmer's capacity by providing adequate farm input and curtail Fulani herdsmen grazing on people's farmland.

Keyword: Evaluation, Nutritional contents, proximate analysis, Sensory properties, Local dishes.

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INTRODUCTION

Nutritional value plays a vital role in selecting dishes because we are what we eat, our body works base on the kind of food we give to it. Most times we think that we give our body the right nutrients it deserves whereas we are destroying the body cells by eating the wrong food. (Merrian Webster, 1928) defined nutrition as the act/ process of nourishing or being nourished specifically. The sum of the process by which an animal or plant takes in and utilize food

substances. According to the council on Food and Nutrition of the American Medical Association Gordon .M (2002) nutrition is the study of interaction of nutrients and other substances in food in relation to health and disease, and the process by which the organism ingests, digests, absorbs, transport, utilizes, and excretes food substances.

According to food standard Agency(2002) the shift from a “paleolithine” to modern diet was clearly characterized by a rejection in the protein content of the diet and makes increase in carbohydrates, particularly simple carbohydrate. The source of information on the composition of food was traditionally printed in food composition tables. These are now been replaced by competitors compositional data base from which the printed version are usually produce. The information is wisely use in the health agriculture and trade sectors.

The eating tradition of every country and culture are the result of millennia of history. Geographical location and climatic conditions play a predominant role in the growing, harvesting and availability of food product influencing the food habits of the ethnic populations. (Finch C.F & Cracknell H.L, 1997). Food habits are symbolized to particular culture. The methods of foods preparation are diverse and related to the types of food available (Field house P, 1995). Food is represented as part of the cultural traits of an ethnic community. The cultural background determine what shall be eaten as well as when and how it shall be eaten. Bhatia A, (1999)

Every tribe of this country has its own unique cooking method develop its own choice of ingredients and blend flavors, representing a fascinating repertoire of ideas, technique and recipes eating habits as well as preparatory recipes differ from place to place. Very often, the taste, colour, texture and appearance of the same delicacy differ from place to place due to traditional method of preparation (Joshi S.R, 2016)

There has been very little research work on the people and traditional cuisine is invariable different from rest of Nigerian because the traditional food habits of the ethnic tribal population. The dishes of the people of these regions are not laced with oil or spices, yet they are delicious. The locally grown aromatic herbs make them exotic. They are light, easy to prepare, and simplicity is all mark of the local cuisine. The basic component of the traditional meal, accomplished by a gravy braise meat or fish and chuney, washed down with soup of boiled

vegetables and fresh salad food is also found varying from place to place and from tribe to tribe within the region.(Mandari Mary& Joshi S.R, 2013)

Local food can also be referred to as traditional dishes that are consumed over the long term duration of civilization that have been pass through generation. Local foods are traditional in nature and may have a historical precedent in national dishes, regional cuisine or local cuisine. Trichopoulou A (2007)

Adeniyi (2014) emphasized on the impact of nutrition on local green leafy vegetable. Leafy vegetable are important items of diet in many Nigerian home and are valuable sources of nutrient especially in urban area. They contribute substantially to protein, minerals, vitamins fiber and other nutrients which are usually in short supply in daily diet. Many local dishes consist of different nutrient. Some local dishes are made from leafy vegetable take for instant, in the eastern part of Nigeria, where there are local cuisine (dishes) are base on vegetables. These vegetables are good sources of mineral and vitamin which our body needs to perform different functions.

According to Obiakor (2014), it is known that about 30% of the population in developing countries are currently suffering from one or more multiple form of nutritional problems. These countries have insufficient intake of food nutrients which are related to food insecurity, diseases, lack of care and excessive or imbalance food intake in dietary constituents. Local dishes in most societies are good and many minor modification are needed for them to meet the nutrient requirements of all members of the family, the starchy food are by far, the most frequently consumed food in Nigeria.

There is need to increase the consumption of local dishes which will helps to bridge the gap between protein , energy and other nutrient . Inadequate nutrient intake by an individual predisposes one to poor nutrition and chronic disease, deficiency disease, caused by lack of such nutrient have been reported among low class in some part of Nigeria.

Statement of the problem

Most people in urban area lack the knowledge about local dishes and nutrient that can be obtained from taking such local food. Some prefer convenience foods such as noodles, corn-flakes and fast food rather than eating local foods that are rich in nutrients due to lack of knowledge and high level of illiteracy. Lastly, inadequate finance makes food item not readily available on the table.

General objective of the study

The general objective of this study is to evaluate the proximate composition and sensory properties of selected local dishes in Ogun state

Specific objectives of the study

1. To know the level of acceptability of the local dishes using organoleptic evaluation of the dishes
2. To know the nutritional content of the dishes using proximate analysis
3. To know the adequacy of the local food

Methodology

The five sample dishes are purposely selected from each region in Ogun state, each ingredient for preparing this local dishes were purchased from Sayedero market in Ilaro Yewa south L.G.A of Ogun state and were prepared in Nutrition and Dietetics kitchen

Area of Study

Ogun state was created in February 1976 from former western state. It borders Lagos state to the south , Oyo and Osun state to the north, Ondo to the east and the republic of Benin to the west. Ogun state consists of 20 local governments. Ogun is state divided into four region these are;

Remo division , Ijebu division , Yewa division and Egba division. Each division has its own local dishes that they consumed

Selection of Panelist

A total of 20 panelists were selected for this study to check for the taste, colour, texture, aroma, appearance and overall acceptability of the dishes

Instrument for Data Collection

A self-administered sensory evaluation sheet was used to collect information using both academic and non-academic staff of Federal Polytechnic Ilaro Ogun state.

Recipe and Preparation Procedure of the Dishes

Each food sample (5 in number) were collected in plastic container. The food ingredient and method used in food preparation were recorded below. The collected samples were oven dried until used for analysis.

Preparation of Ikokore

Ingredients

500g water yam, 150g boned smoked fish, 200ml palm oil, 2 cooking spoon of fresh pepper, pomo, salt to taste.

Procedure

1. Peel and rinse the water yam
2. Grate the water yam into clean bowl
3. Put water in a cooking pot and all ingredient, except palm oil
4. Allow to boil
5. Add the grated water yam to gravy in lumps and allow to cook first before stirring.
6. Add palm oil and stir gently with a spoon
7. Simmer gently.
8. When cooked serves hot either on its own or cold eko, eba and bread as an accompaniment.

Preparation of Ebiripo (Cocoyam Pudding)

Ingredients

15 pieces of cocoyam, water, leaves

Procedure

1. Wash the cocoyam to remove farm sand
2. Peel and rinse in water
3. Grate the yam into a bowl
4. Add some water and mix well to a dropping consistency.
5. Leaves thoroughly cleaned with napkin
6. Prepare a pot with some water for steaming
7. Wrap the grated cocoyam in leaves
8. Put into the pot on fire and steam for 30 minutes
9. Test if cooked, and serves in a plate
10. Served with egusi (melon) soup as an accompaniment

Preparation of Egusi Soup (Mellon)

Ingredients

Apara (oil bean), 200g ground egusi, 30g locus beans, 2 cooking spoon of fresh pepper 150ml of palm oil, 500ml water 300g smoke fish, ponmo 1 large onion, season and salt to taste

Procedure

1. Mix egusi, diced onion, salt, locus beans and little water
2. Put water in the pot to boil

3. Add mixture to the boiling water
4. Add smoke fish and apara into the soup
5. Add salt season to taste
6. Steamed for 5-10 minute
7. Serve with Ebiripo

Preparation of Ofada Rice and its Stew

Ingredients

500g Ofada native rice ,30g locust beans, 50g semi ripe chill pepper,300ml of palm oil, 5 bulb of onion, 20g of ponmo, 30g dried fish seasoning (maggi, salt) to taste .

Procedure

1. Boil the native Ofada rice till it cooked (be sure the rice is clean before boiling)
2. Add salt to the boiled rice
3. Grind all the pepper onions and few tomatoes
4. Pour palm oil on pot, add sliced onions, a pinch of salt allow to fry
5. Add the grinded pepper, dried fish, ponmo, enough locust bean, add a pinch of salt add magi
6. Check the taste if okay leave all to cook for 25 min
7. Serve rice wrap in leaf

Preparation of Waterleaf Soup

Ingredients

Smoked fish, Water leaf, pepper, tomatoes, onion, locust bean, salt, palm oil

Procedure

1. Wash and Shred the waterleaf thinly and keep aside
2. Add the pepper, locust bean, palm oil smoked fish, seasoning cubes, salt
3. Allow to cook for some minute until its done
4. Add the water leaf and stir
5. Allow the vegetable to cook under simmering heat to avoid over cooking of the vegetable the vegetable

Preparation of Amala Lafun

Ingredients

Cassava flour (Amala lafun), water

Procedure

1. Sieve the lafun flour
2. Bring water to boil in a pot
3. Allow the water to continue boiling for sometime
4. Bring down the pot from fire and add the lafun flour a little at a time until it is smooth and thick
5. Serve hot with delicious waterleaf soup

Preparation of Ota

Ingredients

Fresh pepper (Rodo), Onion, seasoning, salt, smoked fish, locust bean, groundnut oil

Procedure

1. Wash the pepper and onion to remove dirty
2. Dice the pepper and onion

3. Remove the bone from the fish and flake
4. Wash the locust bean to remove the dirty
5. Mix all together and add the seasoning and salt to taste
6. Serve using cold pap (Eko) as an compliment

Proximate Analysis

The proximate composition of the local dishes were determined using the analytical procedures as described by AOAC Association of Official Analytical Chemist (2005). The nutrient analyzed was moisture content, ash, crude fibre, crude fat, crude protein and carbohydrate.

Sensory Evaluation of the Local Foods

Sensory evaluation of the dishes were assessed by 20 panelists of both academic and non-academic staff of Federal Polytechnic, Ilaro, Nigeria. Fresh prepared samples of the dishes were assessed for their colour, texture, flavour, aroma, taste and overall acceptability. The panelists were instructed to sip water before and after assessing each product.

9 = Like Extremely

8 = like very much

7 = like slightly

6 = like slightly

5 = dislike slightly

4 = Dislike moderately

3 = dislike very much

2 = dislike extremely

Each treatment was evaluated three times by each panelist

Statistical Analysis

All data collected were subjected to analysis of variance using inferential method (ANOVA) and descriptive statistics using frequency and percentages.

Results

The result on sensory evaluation of the local dishes as presented in table 1-7 showed that most (65-70%) of the taste panelists likes the appearance and colour of sample E (Ota/Eko), most (60%) of the taste panelists like the taste of sample A, most (60%) of the taste panelists like the texture and aroma of sample E. The overall acceptability of the dishes tasted shows that 70% of the respondent accepted sample A and E. The result obtained on proximate composition of the local dishes showed that moisture content has the lowest value of 59.41% in sample A (Ofada rice/Stew) and highest value of 81.22% in (Ota/Eko). Crude fibre 4.51% is the highest value for sample D (Ebiripo/Egusi) and 2.21% is the lowest in sample E (Ota/Eko). Protein content ranged from 5.41-10.91%, highest value of 10.91% in sample E (Ota/Eko) and lowest value of 5.41% was recorded in sample A (Ofada rice/Stew). Fat content ranged from 2.42 -8.54%, sample D (Ebiripo/Egusi) had the highest followed by sample B (Ikokore), sample A (Ofada rice/Stew) and lowest value recorded in sample E (Ota/Eko). Carbohydrate content ranged from 2.67 -26.36%, sample A had the highest value and sample E had the lowest content as shown in table 8.

Table 1:- Distribution of taste panelist according to appearance

Code of likeness	Percentages of likeness (%)									
	Sample A		Sample B		Sample C		Sample D		Sample E	
	Freq.	(%)	Freq.	(%)	Freq.	%	Freq.	(%)	Freq.	(%)
4	-	-	-	-	1	5	-	-	-	-
5	-	-	-	-	1	5	-	-	-	-
6	-	-	1	5	1	5	-	-	-	-
7	1	5	5	25	2	10	4	20	2	10
8	6	30	8	40	5	25	10	50	4	20

9	13	65	6	30	10	50	6	30	14	70
Total	20	100	20	100	20	100	20	100	20	100

Source: Field survey August (2017)

Table 2: Distribution of taste panelist according to color

Code of likeness	Percentages of likeness (%)									
	Sample A		Sample B		Sample C		Sample D		Sample E	
	Freq.	(%)	Freq.	(%)	Freq	%	Freq	(%)	Freq.	(%)
3	-	-	-	-	1	5	-	-	-	-
5	-	-	-	-	-	-	-	-	1	5
6	1	5	1	5	1	5	1	5	-	-
7	-	-	5	25	4	20	8	40	2	10
8	9	45	6	30	5	25	7	35	4	20
9	10	50	8	40	9	45	4	20	13	65
Total	20	100	20	100	20	100	20	100	20	100

Source: Field survey August (2017)

Table 3:- Distribution of taste panelist according to taste.

Code of likeness	Percentages of likeness (%)									
	Sample A		Sample B		Sample C		Sample D		Sample E	
	Freq.	(%)	Freq.	(%)	Freq	%	Freq	(%)	Freq.	(%)
2	-	-	-	-	1	5	-	-	-	-
4	-	-	1	5	1	5	1	5	-	-
6	-	-	1	5	2	10	1	5	1	5
7	3	15	4	20	5	25	6	30	1	5
8	5	25	10	50	3	15	5	25	8	40
9	12	60	4	20	8	40	7	35	10	50
Total	20	100	20	100	20	100	20	100	20	100

Source: Field survey August (2017)

Table 4 :- Distribution of taste panelist according to texture

Code of likeness	Percentages of likeness (%)									
	Sample A		Sample B		Sample		Sample D		Sample E	
	Freq.	(%)	Freq.	(%)	Freq	%	Freq	(%)	Freq.	(%)
3	-	-	-	-	1	5	-	-	-	-
4	-	-	1	5	-	-	-	-	-	-
6	1	5	-	-	2	10	2	10	-	-
7	3	15	5	25	5	25	3	15	2	10

8	8	40	5	25	9	45	11	55	6	30
9	8	40	9	45	3	15	4	20	12	60
Total	20	100	20	100	20	100	20	100	20	100

Source: Field survey August (2017)

Table 5:- Distribution of taste panelist according to aroma

Code of likeness	Percentages of likeness (%)									
	Sample A		Sample B		Sample C		Sample D		Sample E	
	Freq.	(%)	Freq.	(%)	Freq	%	Freq	(%)	Freq.	(%)
4	-	-	-	-	1	5	-	-	-	-
6	1	5	1	5	2	10	2	10	1	5
7	3	15	5	25	3	15	6	30	1	5
8	9	45	8	40	8	40	6	30	6	30

9	7	35	6	30	6	30	6	30	12	60
Total	20	100	20	100	20	100	20	100	20	100

Source: Field survey August (2017)

Table 6: Distribution of taste panelist according to overall acceptability

Code of likeness	Percentages of likeness (%)									
	Sample A		Sample B		Sample C		Sample D		Sample E	
	Freq.	(%)	Freq.	(%)	Freq	%	Freq	(%)	Freq.	(%)
6	-	-	-	-	-	-	-	-	1	5
7	-	-	2	10	4	20	2	10	-	-
8	6	30	9	45	7	35	8	40	5	25
9	14	70	9	45	9	45	10	50	14	70
Total	20	100	20	100	20	100	20	100	20	100

Source: Field survey August (2017)

SENSORY EVALUATION OF SOME OGUN STATE LOCAL DISHES

Table 7 ANOVA Table

SAMPLE	COLOUR	APPEARANCE	TASTE	AROMA	TEXTURE	OVERALL ACCEPTABILITY
A	8.40±0.13 ^a	8.60±0.01 ^{ab}	8.45± 0.05 ^a	8.10±0.11 ^a	8.15 ± 0.11 ^a	8.70± 0.01 ^a
B	8.05± 0.02 ^b	7.55±0.07 ^c	7.70± 0.13 ^{ab}	7.95±0.03 ^{ab}	8.00± 0.03 ^{ab}	8.35 ± 0.013 ^{ab}
C	7.90±0.11 ^{ab}	7.95±0.04 ^b	7.45±0.02 ^c	7.75±0.11 ^{bc}	7.45±0.005 ^c	8.25± 0.01 ^c
D	7.70±0.03 ^c	7.95±0.01 ^b	7.45± 0.13 ^b	7.80±0.01 ^{bc}	7.75± 0.11 ^b	8.40± 0.13 ^{ab}
E	8.40±0.13 ^a	8.70±0.11 ^a	8.35± 0.11 ^a	8.45±0.07 ^a	8.50±0.07 ^a	8.55± 0.05 ^b

Source: Field survey August (2017)

Values are means with same expressions in column are statistically non-significant at 0.05% level of confidence. Sample A:- Ofada/Stew, Sample B:- Ikokore, Sample C:- Amala/ Gbure Soup , Sample D:- Ebiripo/Egusi soup, Sample E:- Ota/Eko

Table 8: Proximate composition of some Ogun State local dishes

parameters	Samples				
	A	B	C	D	E
MOISTURE	59.41±0.03 ^d	75.92±0.03 ^b	68.72±0.05 ^c	65.52±0.05 ^c	81.22±0.03 ^a
ASH	0.64± 0.01 ^c	0.85±0.08 ^b	0.64±0.01 ^c	0.93±0.02 ^a	0.57±0.01 ^d
FIBRE	2.55±0.03 ^c	3.53±0.02 ^b	3.12±0.01 ^b	4.15±0.01 ^a	2.21±0.03 ^c
PROTEIN	5.41±0.11 ^c	6.02±0.06 ^d	7.93±0.03 ^c	9.94±0.02 ^b	10.91±0.01 ^a
FAT	5.63±0.01 ^c	6.22±0.03 ^b	5.22±0.07 ^c	8.54±0.02 ^a	2.42±0.07 ^d
CARBOHYDRTE (By difference)	26.36±0.01 ^a	7.46±0.21 ^d	14.37±0.05 ^b	10.92±0.02 ^c	2.67±0.02 ^e

Source: Field survey August (2017)

Values are means + standard deviations of triplicate determinations. Sample A:Ofada rice, sample B:Ikokore, sample C:Amala/Gbure soup, sample D:Ebiripo/Egusi soup and sample E:Ota/Eko.

Discussion

The result of the sensory evaluation showed that (65- 70%) of the panelists likes the appearance and colour of sample E (Ota and Eko), 60% of the panelists likes the taste of sample A (Ofada rice and Stew), 60% of the panelists likes the texture and aroma of sample E (Ota and Eko).The overall acceptability of the dishes tasted by the taste panelists shows that (70%) likes sample A and E (Ofada rice/ stew and Ota/Eko).

No statistical differences ($p < 0.05$) were found with the values ranging from 7.45 to 8.70 for colour, appearance, taste, aroma, texture, and overall acceptability among the products respectively

The result obtained on chemical composition of selected dishes such as Ofada rice and stew, Ikokore, Amala and vegetable stew (Gbure), Ebiripo and Egusi posu (melon stew) and Eko served with Ota are consistent with the earlier report of (Olawunmi et al., 2012) which stated that all the dishes have high moisture content which indicates bad keeping quality because food spoiling microflora thrives where there is adequate moisture.

The moisture content of the research work ranged from 59.41 to 81.22%. The lowest value of 59.41% was recorded for sample A (Ofada rice/stew) while the highest value of 81.22% was recorded in sample E (Eko/Ota).

The crude fibre content ranged from 2.21 to 4.51% with the highest value recorded in sample D (Ebiripo/Egusi soup) while the lowest value was recorded in sample E (Eko/Ota). Crude fibre helps in the maintenance of normal peristaltic movement of the intestinal tract hence diets containing low fibre that could cause constipation and eventually lead to colon disease, piles, cancer and appendicitis (Oguntona, 1995). (Jane *et al.*, 1992) reported that fibre from colocasia species of cocoyam incorporated into ice cream sherbet effectively activated the action of the bifido bacteria for good digestion of vitamins.

The protein content in the samples ranged from 5.41 to 10.1 where the highest value was observed in sample E (Ota/Eko) and the lowest was observed in sample A (Ofada rice/ stew). The value obtained on protein content is consistent with the earlier report of (Al-Numair and Ahmed, 2008). Protein helps in building and maintaining all tissues in the body forms an important part of enzymes, fluids and hormones of the body and also helps forms antibodies to fight infection and supplies energy.

The sampled dishes also provided one-third of the recommended dietary allowance (RDA) with respect to protein (7.5-12.5%) as recommended by Food and Agriculture Organization (FAO/WHO/UNU, 1985). The fat content of the research value was recorded in sample D (Ebiripo/Egusi soup) followed by sample B (Ikokore) Sample A (Ofada rice /stew) and the lowest value recorded in sample E (Eko/Ota). This is in agreement with the report of (National Research Council, 2006) and (Nutritional and wellness Funmi Badejo Blog) which says Egusi comprise mainly of mono-unsaturated omega 9 fatty acids. The carbohydrate content ranged from 2.67 to 26.36% with the highest value recorded in sample A (Ofada rice/stew) and the

lowest recorded in Sample E (Ota/ Eko) Carbohydrate supplies quick sources of metabolic energy. (Olawunmi *et al.*, 2012)

All the sample in this present research work have significant differences of ($p < 0.05$) in the nutritional composition in terms of moisture, ash, fibre, protein, fat and carbohydrate content and this could be attributed to the different food stuffs used. However, Magkos *et al.*, (2003), Brown and Prescott, (1999) and Williams, (2002) reviewed that there is no evidence of difference in nutrient quality between organically and conventionally produced food stuffs.

Conclusion

Based on the result obtained from the proximate analysis of Ebirinpo/Egusi soup, Ikokore, Ofada rice/stew, Eko/Ota and Lafun/water leaf soup in this work, the local dishes can be regarded as good sources of basic nutrient which can meet the recommended dietary allowance of the consumer.

A right combination of the local dishes would serve as means of obtaining a nutritionally balanced meal and subsequently meeting the required ration for body development. In other word, consumption of variety of local dishes enhanced the nutritional status of individual since the nutrient densities differs and consumption of various kinds of foods ensues adequacy. Finally, it can be concluded that local foods are fresher and tastier. With this, one is supporting the farmers by investing ones naira close to home and keeping one in touch with the season which makes us get the food at their wholesome state, more abundant and less expensive.

Recommendations

The study recommends that

2. There is urgent need for Nigerian to put in place food composition table for local foods especially those rich in protein, carbohydrate, crude fiber and vitamins.
3. Nutrition education programme and workshop needs to be intensified in public health centers and civic centers to promote its food use and diversification.
4. Dietary guideline, the nutritive value and health aspects of these foods needs to be taken into consideration.

5. Government should encourage the society to make local produce their choice than processed or refined food
6. Government needs to help increase farmer's capacity by providing adequate farm input and curtail Fulani herdsmen grazing on people's farmland.

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