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Quality evaluation of biscuit produced from blends of cassava and African breadfruit flour

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ABSTRACT

This study evaluated the quality of biscuit produced from cassava and Africa breadfruit composite flour. Four blends of cassava and breadfruit were prepared in the proportions: 50:50, 30:70 and 70:30, to obtain samples B,C and D respectively while 100% cassava flour (A) served as the control. Flour blends were used to bake biscuit. Proximate and mineral compositions as well as the sensory acceptability of the products were evaluated using standard analytical methods. Statistics showed that a significant difference ($p<0.05$) existed amongst the samples in the proximate and mineral composition. Results of proximate analysis showed that moisture content of biscuit range from 3.00-6.00%, ash 4.00-10.00%, fibre 5.00-15.03%, fat 15.00-18.00%, protein 7.44-8.75% and carbohydrate 52.15-60.28%.The iron, phosphorus, zinc, sodium, potassium, magnesium and calcium content of the biscuits ranged from0.24-1.50mg/100g, 160.00-247.66mg/100g, 148.33-190.3mg/100g, 63.00-111.02mg/100g, 90.40-183.47mg/100g, 12.16-36.48mg/100g respectively. All attributes assessed did not significantly ($p>0.05$) affect the acceptability and preference of the samples except for the taste which showed a significant difference (p<0.0.5). Cassava flour could be substituted with African breadfruit at up to 30% in biscuit since it did not affect the sensory qualities. Apart from adding value and varieties to biscuit, the data obtained clearly show the nutritional potentials of African breadfruit as alternative food ingredient for food fortification.

Keywords: Africa breadfruit, cassava, biscuit, proximate and minerals

1. INTRODUCTION

Biscuits are nutritive snacks produced from unpalatable dough that is transformed into an appetizing product through the application of heat in an oven [1]. Kulkari also stated that biscuits are ready to eat, convenient and inexpensive food products containing digestive and dietary principle of vital importance [2]. The production of biscuit as a mixture of flour and water but may contain fat, sugar and other ingredients mixed together into dough which is rested for a period and then passed between rollers to make a sheet [3].

In the tropics, cassava (*Manihot esculenta crantz*) is the most productive crop and cheapest source of calories for man. Cultivation of cassava has increased tremendously in Nigeria and this is due to its adaptation to short periods of fallow, thriving in dry season and poor soils. It is the fourth most stable food in the world after rice, wheat and maize. It is the chief source of edible carbohydrate and could be processed into different forms of human food. Examples are: garri, fufu, abacha, achicha etc. These products are well liked and consumed daily. However, because of its low protein content (1-2%) populations which eat a lot of it do not receive an adequate intake of good quantity of protein and as such are prone to malnutrition.

African Breadfruit (*Treculia africana*) is a widely cultivated crop in south western Nigeria. It is a crop fruit that is propagated with the root cuttings and the average age bearing fruit crop is between 4-6 years [4]. It produces its fruit up to 3 times in a year and the number of fruits produced is very high. The breadfruit seeds are made into various dishes; it can be fried, boiled or mashed to make porridge. It can also be processed into flour and be used in bread and biscuit making [4].

In Nigeria, breadfruit is known as "Ukwa" among the Igbo tribe and "iyanaloke or gbere fruit" among the Yorubas. Breadfruit has been reported to be rich in fat, ash, fiber and protein [5]. African breadfruit is also a good source of mineral (Iron), vitamin, especially nacin, riboflavin and pro vitamin A [6]. Despite the importance of this fruit, its production is faced with several problems including short shelf-life though the processing of the fruit into flour extends its shelf-life [7].

Composite flour technology is important because of the advantage of reducing the huge amount of money spent on wheat flour importation, coupled with the prospects of utilization of underutilized crops. Cassava flour is fortified with African breadfruit flour in this project because of breadfruit's high protein content.

What really instigated the study on the proximate, sensory and mineral evaluation of biscuit made from cassava and breadfruit flour is the increase in the price of wheat and finding a way of utilizing underutilized raw materials in the country. Also the acceptability of the end products among consumers in terms of sensory attributes is an important issues to be considered in bakery production.

Table 1: Composition of the Flour

Sample	Wheat Flour	Chicken powder flou
A	100	0
B	50	50
C	60	40
D	40	60

The study aimed at evaluating the proximate, sensory and mineral properties of biscuits made from Cassava and African breadfruit flour.

2. MATERIALS AND METHODS

2.1. Collection of Raw Materials

One kilogram of breadfruit, three kilograms of cassava roots and other materials such as sugar, butter, baking powder, eggs and milk flavor were purchased from a local market in Nanka, Orumba North Local Government Area and taken to Food processing Laboratory of Food Technology Department, Federal Polytechnic Oko, for further processing.

2.2. Preparation of Cassava Flour

Cassava flour was produced according to the methods of Falola A.O *et al.,* with slight modification [8]. Freshly harvested cassava roots was sorted, peeled, washed and manually grated. The resulting mash was bagged in a sack and dewatered using hydraulic press. The dewatered cake was sun dried and then further dried effectively in a cabinet drier at a temperature of 60°C for 3-4 hrs. The resulting material was milled and sieved to obtain fine flour. The flour was sealed in cellophane bag and stored at room temperature (25°C) until needed for further use.

2.3. Preparation of African breadfruit Flour

The method described in the study of Eke-Ejiofor (2013) was adopted in the production of African breadfruit flour [9]. The African breadfruits were thoroughly washed to remove dirt and unwanted materials. They were then blanched at 62°C (for easy dehulling), dehulled and washed with clean water. The seeds were then dried using cabinet drier at 70°C for 18 hours. Dried African breadfruit seeds were milled into flour. Flour obtained was sieved to obtain smooth flour. It was stored in an airtight container and subsequently used for baking.

2.4. Formulation of Flour Blends

Cassava flour and African breadfruit flour were prepared in the percentage proportion of 100:0, 50:50, 70:30, 30:70, The 100% cassava flour biscuit was used as the control sample.

2.5. Biscuit production

Biscuits were produced from the four formulations using the modified method of Oluwamukomi (2011) [10]. Ingredients used were sugar, fat, sodium bicarbonate, salt, egg and milk. Sugar and fat (margarine) were mixed together, and then cassava flour, African breadfruit flour, common salt, sodium bicarbonate and egg were added to prepare dough. The paste was rolled on a flat rolling board sprinkled with some flour to a uniform thickness using a wooden hand roller. Different shapes of biscuits were cut, placed on a greased baking tray and kept at a normal room temperature for 2hrs to allow proper dough leaving. Then these trays of the flour blends were baked at once in an oven at a temperature of 120°C for between 25-30 min. When a very light brown color was formed, biscuits were removed, allowed to cool, packed in airtight container and stored.

2.6. Proximate Analysis

The proximate analysis of the cake samples was carried out using the analytical methods of AOAC (2019) [11].

2.6.1. Determination of Moisture Content

Five grams (5g) of the sample was weighed into a previously weighed moisture can. The sample in the can was dried in the moisture extractor at 105°C for 3hours. It was cooled in a dessicator and weighed. It was returned to the oven for further drying. Drying, cooling and weighing was done repeatedly at an hour interval until there was no further diminution in the weight (i.e. a constant weight was obtained). The weight of moisture loss was calculated and expressed as a percentage of the weight of sample analyzed.

$$\% \text{ moisture content} = \frac{W_2 - W_3}{W_2 - W_1} \times 100$$

Where,

W_1= Weight of empty can

W_2 =Weight of empty can + Sample before drying

W_3= Weight of can + Sample dried to a constant weight

2.6.2. Determination of Ash content

Clean dried crucibles were weighed on an electronic balance and 10g of sample weighed into crucibles. The samples were dried in the moisture extraction oven until constant weights was obtained. Then, sample was burnt to ashes in a muffle furnace at 550°C. When completely ashed, it was cooled in a dessicator and weighed. The weight of ash obtained was calculated by difference and expressed as a percentage of the weight of sample analyzed.

$$\% \text{ Ash Content} = \frac{W_2 - W_1}{W_S} \times 100\%$$

Where,

W_1 = Weight of empty crucible

W_2= Weight of crucible +Ash

W_S= Weight of Sample

2.6.3. Crude Fibre Determination

Two grams of the sample was boiled in 150 ml of 1.25% of H_2SO_4 solution for 30 minutes under some conditions. After washing in several portion of hot water, the sample was allowed to drain and dry before being transferred quantitatively to a weighed crucible where it was dried in the oven at 105°C to a constant weight. It was thereafter taken to a muffle furnace where it was burnt until only ash was left of it by difference; the weight of fibre was obtained and expressed as a percentage of weight of Sample analyzed. It was given by equation

$$\% \text{ Crude Fibre} = \frac{W_2 - W_3}{W_S} \times 100\%$$

Where,

W_2 = weight of crucible + sample after boiling, washing and drying.
W_3 = weigh of crucible + sample ashing
W_S= Weight of Sample

2.6.4. Determination *of Fat*

Ten grams (10g) of the sample was weighed into a thimble carefully and put in the sample holder of the soxhlet extraction apparatus. A clean dried and weighed soxhlet extraction flask was filled with 250ml of N hexane and the whole apparatus was assembled together, and the flask placed on the heating mantle and heated at 68°C. The fat was extracted for three hours. The drying, cooling and re-weighing of the sample was repeat until a constant weigh is obtained. The percentage fat contained was determined.

$$\% \text{ Fat} = \frac{W_2 - W_3}{W_2 - W_1} \times 100$$

Where,

W1= Weight of empty filter paper

W2= Weight of paper + sample before defatting

W3= Weight of paper + sample after defatting

2.6.5. Determination *of Crude protein*

This was done according to the method described by AOAC (2019) [11]. The total nitrogen was determined and multiplied with factor 6.25 to obtain the protein content. Half gram (0.5g) of the sample was mixed with 10ml of concentrated H_2SO_4 in a digestion flask. A tablet of selenium catalyst was added to it before it was heated under a fume cupboard until a clear solution was obtained (i.e the digest). The digest was diluted to 100ml in a volumetric flask and used for the analysis.10ml of the digest was mixed with equal volume of 45% NAOH solution in a Kjeldahl distillation into 10ml of 4% buric acid containing three drops of mixed indicator (bromocressol green/methyl red). A total of 50ml of distillates was collected and titrated against 0.02N EDTA from green to a deep red end point . A reagent blank was also digested, distilled and titrated. The nitrogen and protein content was calculated using the formula below:

% Protein = % N2× 6.25

$$\% \text{ B2} = \frac{100}{10} * \frac{N*14}{1000} * \frac{Vt(T-B)}{Va}$$

Where,
W= Weight of sample (0.5g)
V_t= Total digest volume (100ml)
V_a= Volume of digest analyzed (10ml)
T= Sample titre value
B= Blank titre value

2.6.6. Determination *of Carbohydrate*

Carbohydrate content was determined by the difference of all. It was calculated using the formula below:

% Carbohydrate = 100-% (moisture + protein + ash + fibre + fat)

2.6.7. Determination *of Mineral content*

The mineral content of the samples was determined as described in the study of Ndife *et al.,* (2014) [12]. A fraction of 0.3g each of the paste-like sample was wet digested in a 50ml beaker using 30ml of HNO_3-$HClO_4$ acid solution (2:1 volume) on a hot digestion system to obtain a colourless solution after heating. At the completion of digestion, the solution if each sample was transferred into a 50ml calibrated sample bottle and the solution were diluted to the mark with distilled water. Calcium (Ca), Magnesium (Mg), Iron (Fe) and Zinc (Zn) in the samples were determined by flame atomic absorption spectrophotometer. Sodium (Na) and Potassium (K) in the samples were determined by flame photometer using a working standard of 10ppm for each of the species.

2.7. Sensory Evaluation

The cookies produced from Wheat flour and the composite Flour were subjected to sensory evaluation and this was done by coding all the samples and serving them to twenty panelists that were familiar with the assessment of bakery products. The cookies samples were evaluated for sensory parameters which are texture, taste, appearance, flavour and general acceptability using the scoring text. The responses were scored on a nine point hedonic scale ranging from 1(dislike extremely) to 9 (like extremely).

2.8. Statistical Analysis

All analysis was carried out in triplicates for all determinations and the results were expressed as mean of the triplicate determination. The SPSS version 21.0 for windows computer software package was used for one way analysis of variance (ANOVA). The difference in means was compared by using the Duncan's multiple range tests.

3. RESULTS AND DISCUSSION

The result of the proximate composition of biscuits produced from the flours blends of cassava and breadfruit is presented in Table 1. There was a significant difference ($p<0.05$) in the moisture content of the biscuit samples which ranged from 3.00% to 6.00%. Sample D has the highest moisture content while sample C has the least moisture content. Generally, the whole biscuit samples have low moisture content. This implies that the biscuits will last long and be shelf stable if packaged properly. This result is however not in agreement with the findings of Olaoye *et al.,* (2007) [7] who reported a moisture content ranging from 11.40% to 11.75% for biscuits produced from the blends of wheat flour and breadfruit flours. The variation in these results may be attributed to the differences in the raw materials used.

The ash content of the samples ranges from 4.00% to 10.00% with sample D having the least value while sample C has the highest ash content. Statistically, there was a significant difference ($p<0.05$) in the ash content of the biscuit samples. It was observed that inclusion of breadfruit flour at up to 50% level of substitution significantly increased the ash content of the biscuits. Similar increase in ash content was observed in the study of Aderinola and Allikura (2015) [13] for cookies produced from composite flours of wheat and breadfruit. According to Udio *et al.*, (2003) [14] African breadfruit contains comparatively higher ash content than wheat and this could be responsible for the higher ash contents recorded for the samples substituted with breadfruit flours. It shows that incorporation of breadfruit flour in the process of biscuit making could enhance the mineral intake of many people, as ash is indicative of the amount of minerals contained in any food sample Olaoye *et al.*, (2007) [7].

The fiber content of the biscuit samples were 5.00% for sample D, 10.00% for sample B and C and 15.03% in sample A. There was no significant difference ($p>0.05$) fibre content of samples B and C but these samples significantly differed ($p<0.05$) from the rest of the samples. Although, there was no definite trend in the fibre content. Lower Fibre content ranging from 1.00% to 2.20% was reported by Eke-Ejiofor (2013) [9] for biscuits produced from composite flours if sweet potato, wheat and breadfruit flour. This deviation may be due to the difference in the raw materials used as well as the recipe used in the Formulation of the biscuits. Crude Fibre is known to aid the digestive system of human, indicating that the A could attract good acceptability by many people as well as health organization [7].

The fat content of the biscuits samples were generally high. It ranges from 15.00% in samples A and C to 18% in the B. The resulted revealed that a significant difference existed in the fat content of the biscuit. An increased was observed in the fat content of the samples

Table 1: Proximate composition (%) of biscuits produced from blends of cassava and African breadfruit flour

Sample	Moisture	Ash	Fibre	Fat	Protein	Carbohydrate
A	$4.00^{b}\pm0.10$	$6.00^{c}\pm0.00$	$15.03^{a}\pm0.50$	$15.00^{c}\pm0.50$	$7.44^{d}\pm0.03$ 52	$52.15^{c}\pm0.05$
B	$3.30^{c}\pm0.00$	$8.00^{b}\pm0.60$	$10.00^{b}\pm0.09$	$18.00^{a}\pm1.00$	$8.75^{a}\pm0.10$	$54.56^{b}\pm0.00$
C	$3.00^{d}\pm0.00$	$10.0^{a}\pm0.10$	$10.00^{b}\pm0.01$	$15.00^{c}\pm0.00$	$7.88^{c}\pm0.02$	$54.42^{b}\pm0.02$
D	$6.00^{a}\pm0.01$	$4.00^{d}\pm0.30$	$5.00^{c}\pm0.00$	$16.00^{b}\pm0.60$	$8.58^{b}\pm0.10$	$60.28^{a}\pm0.01$

Table 2: Mineral composition (mg/100g) of biscuits produced from blends of cassava and African breadfruit flour

Sample	Fe	P	Zn	Na	P	Mg	Ca
A	$0.24^{d}\pm0.01$	$160.00^{d}\pm0.01$	$148.33^{d}\pm0.02$	$63.00^{d}\pm0.06$	$190.40^{a}\pm0.01$	$36.48^{a}\pm0.01$	$17.02^{b}\pm0.02$
B	$1.22^{b}\pm0.01$	$247.66^{a}\pm0.11$	$190.30^{a}\pm0.03$	$111.02^{a}\pm0.01$	$183.47^{a}\pm0.03$	$12.6^{d}\pm0.01$	$14.59^{c}\pm0.00$
C	$1.50^{a}\pm0.00$	$202.30^{c}\pm0.10$	$171.03^{c}\pm0.01$	$85.33^{c}\pm0.33$	$95.3^{c}\pm0.02$	$31.62^{b}\pm0.02$	$14.55^{c}\pm0.00$
D	$0.50^{c}\pm0.01$	$233.60^{b}\pm0.10$	$176.03^{b}\pm0.06$	$88.73^{b}\pm0.03$	$146.0^{b}\pm0.00$	$29.18^{c}\pm0.01$	$19.46^{a}\pm0.02$

Table 3: Sensory Evaluation of biscuits produced from blends of cassava and African breadfruit flour

Samples	**Appearance**	**Taste**	**Flavor**	**Texture**	**Overall Acceptability**
A	$7.40^{a}\pm1.58$	$6.50^{ab}\pm0.97$	$5.50^{a}\pm1.27$	$6.40^{a}\pm65$	$6.45^{a}\pm1.11$
B	$7.70^{a}\pm1.57$	$5.30^{c}\pm1.10$	$5.70^{a}\pm1.57$	$6.30^{a}\pm1.25$	$6.30^{a}\pm1.25$
C	$6.40^{a}\pm2.27$	$7.00^{a}\pm1.63$	$6.40^{a}\pm2.22$	$6.10^{a}\pm2.13$	$6.48^{a}\pm1.75$
D	$6.70^{a}\pm2.11$	$6.5^{ab}\pm2.17$	$6.60^{a}\pm1.63$	$6.60^{a}\pm1.08$	$6.48^{a}\pm1.63$

* Means with same superscript in the same row are not significantly different ($p<0.05$)

A: 100% Cassava Flour (control), B: 50% Cassava Flour: 50% Breadfruit flour, C: 30% Cassava Flour: 70% Breadfruit flour, D: 70% Cassava Flour:30% Breadfruit flour

as the level of substitution of cassava flour with breadfruit flour increased probably due to the fat content in the breadfruit [15]. This result is in line with the report of Falola *et al.,* (2011) [8] who reported similar increase the fat content of cookies produced from cassava and cucurbita seed composite Flours.

Fat plays a significant role in the shelf life of food products and as such relatively high fat content could be undesirable in baked food products. This is because fat can promote rancidity in foods, leading to development of unpleasant and odorous compounds [7]

There was a slight increase in protein content of biscuit samples which ranges from 7.44% to 8.75% and a significant difference ($p<0.05$) existed among the samples. The sample with 50% breadfruit flour (B) has the highest protein content while the control sample has the least percentage of protein. These results are however; lower than the values reported in the studies [7]. The varied results could be due to the differences in the raw material used, the experimental method adopted and the processing methods. Also cassava is known to contain a very low protein [16] and may have contributed to the low protein content of the products.

The carbohydrate contents were highest for biscuits in terms of all proximate composition parameters (that is crude protein, crude fibre, ether extract, ash, moisture and carbohydrate) determined in this study. This was expected as the ingredients composed of mainly carbohydrate rich materials, which are cassava and breadfruit flours.

Table 2 shows the mineral content of biscuits produced from composite flours of cassava and African breadfruit flours. The iron content from Table 2 shows that the value ranges from 0.24-1.22mg/100g. Significant difference ($p<0.05$) existed among the samples. The results revealed that inclusion of breadfruit flour in the biscuits slightly increased the iron content of the products.

Similar results were recorded for cookies produced from blends of wheat-tiger-nut flour and cocoyam-tigernut flour respectively [17-18]. Iron is important in haemoglobin formation, oxygen and electron transport in the human body [19]. The Iron content in this study is less than the maximum limit of iron concentration in food given by FAO/WHO (2001) [20] which is 42.5mg/100g.

There was significant difference ($p<0.05$) in the phosphorus and zinc content of the biscuits. Their values range from 160.00-247.66mg/100g and 148.33-190.30mg/100g respectively. Both minerals are higher in sample (B) but lesser in sample (C). This is an indication that inclusion of African breadfruit flour in the biscuit samples significantly improved their phosphorus and zinc content. The values for phosphorus obtained in this study are similar to the ones reported by Akajiaku *et al.,* (2018) while that of zinc is significantly higher than the reports of Akujobi (2018) [17-18]. These deviations may be due to differences in the raw materials used.

Zinc is a component of every living cell and plays a role in hundreds of bodily function from assisting in enzyme reaction to blood clotting and essential for taste, vision and wound healing. Phosphorus is an essential mineral primarily used for growth and repair of body cells and tissue. Phosphorus together with calcium provides structure and strength. Phosphorus is also required for a variety of biochemical processes including energy production and regulation [21].

Similar trend was observed in the sodium and potassium content of the biscuits. The sodium ranges from 63.00-111.02mg//100g and the potassium content ranges from 90.40-183.47mg/100g. The sample with 50% of both breadfruit and cassava flour had significantly ($p<0.05$) higher sodium and potassium content when compared to the rest of the samples. There was significant difference ($p<0.05$) amongst the samples. Sodium is the major cation in extracellular fluid in the body and necessary for maintenance of plasma volume, acid-base balance, normal cell function and transmission of nerve impulse while potassium is a major nutrient for the maintenance of total body fluid volume, acid-base and electrolyte balance [9, 22].

The magnesium content among the formulated biscuit ranged from 12.16 to 36.48mg/100g. There are significant differences ($p<0.05$) in the magnesium content among the formulated biscuit samples. The highest values were recorded for sample A (control) and the least was recorded for sample B. These magnesium values were higher than those recorded by Akujobi. (2018), cookies made from cocoya and tigernut with values ranging from 7.22mg/100g - 9.56mg/100g [18]. The values obtained from this study were lower than the value recommended by US RDA for magnesium (280mg/100g and 350mg/100g) for women and men respectively [21]. Magnesium is an activator of many enzyme systems and maintains the electrical potential in the nerves. Magnesium works with calcium to assist in muscle contraction, blood clotting and the regulation of blood pressure and lung function [23]. The biscuits could make an ideal meal for both men and women since it contained a significant amount of the element.

The calcium contents of the samples ranges from 14.55 to 19.46mg/100g with the highest observed in sample D while the least value occurred in sample C. Higher calcium values (26.63mg/100g to 31.64mg/100g) were recorded for cookies made from blends of wheat and tigernut flour [24].

The calcium content values obtained in this study were lower than the US RDA for calcium (1000mg/100g).

Calcium is one of the most important minerals that the body requires and its deficiency is more prevalent than any other mineral [24]. Since the formulated biscuit samples contained a significant amount of the element, they could make an ideal meal for children and adult alike.

The mean sensory score of the formulated biscuit samples are shown in Table 3 above. The sensory parameters evaluated include: colour, taste, flavour, texture and overall acceptability of the formulated products. The results showed that there was significant difference ($p<0.05$) only in the taste of the samples. Sample (C) had the highest taste score of 7.00 indicating that it was moderately liked by the panelists while sample (B) has the least score of 5.20 indicating that it was neither liked not disliked according to 9 -point Hedonic scale rating.

On the other hand, there was no significant difference ($P>0.05$) in the appearance, flavour, texture and overall acceptability of the formulated biscuits. Sample (D) and (C) recorded the highest sensory scores while sample B recorded the least sensory scores for all the aforementioned sensory parameters. It could be that the panelists disliked the sample (B) because of the 50% breadfruit flour substitution. Amongst flavour, taste and texture and general acceptability of the formulated biscuits measured the panelist preference which was represented as sensory scores increased with a corresponding decrease in breadfruit flour addition. It is therefore evident that the concentration of breadfruit flour incorporation influenced the panelist's preference of the formulated products.

4. CONCLUSION

The study has shown that incorporation of various proportions of breadfruit flour into cassava flour in biscuit formulation significantly influenced the proximate and mineral composition as well as sensory qualities of the formulated biscuits. The study showed increased addition of breadfruit flour increased the protein, ash, fat and mineral content of the biscuit with a decrease in carbohydrate content. The results further revealed that 30% breadfruit flour produced the overall best result in terms of the sensory quality. Cassava flour could therefore be replaced with up to 30% with breadfruit seed flour in biscuit production without affecting the sensory qualities. This study has opened up new possibilities of application of breadfruit flour and cassava flours. Utilization of breadfruit flour in product development is a means of reducing wastage due to post harvest losses of the fruit and also serves as a cheap source of nutrients.

5. ACKNOWLEDGEMENT

NA

6. CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

7. SOURCE/S OF FUNDING

NA

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