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Effect of Processing Treatments on the Quality of Bread Supplemented with Pigeon Pea Seed Flour

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Aim: The study investigated the effect of processing treatments on the quality of breads supplemented with pigeon pea flour.
Study Design: The study was carried out in 3 replications in completely randomized design. The data were analyzed using analysis of variance (ANOVA). Significance was accepted at $p<0.05$
Place and Duration of the Study: The study was carried out in 2016 at The Federal Polytechnic, Idah, Kogi State, Nigeria.
Methodology: Flour samples were prepared from raw, toasted, boiled, germinated and fermented pigeon pea seeds. Each of the flour samples was used to substitute 10% of wheat flour. Breads were prepared from the various blends and evaluated for the physical, chemical and sensory properties.
Results: The bread containing germinated pigeon pea flour had comparable height, length and width with the 100% wheat flour bread. The bread containing germinated flour had higher volume and specific volume than the other bread samples. The bread containing germinated pigeon pea flour was preferred to the other bread samples containing pigeon pea flour in overall acceptability and all the sensory attributes evaluated. Only germination of the seeds increased the protein content of the bread from 23% in the bread containing raw pigeon pea flour to 25.4%. All the breads containing treated pigeon pea flour had lower fat contents than the bread containing untreated

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pigeon flour. The crude fiber content slightly increased in the bread containing germinated flour.
Conclusion: All the breads containing treated pigeon pea flours had higher crude protein, fat and crude fiber contents but lower carbohydrate contents that the 100% wheat flour bread. Germinated, toasted, boiled and fermented pigeon pea flour could serve as protein supplements in bread.

Keywords: Pigeon pea; boiling; toasting; germination; fermentation; bread.

1. INTRODUCTION

Bread is a major staple wheat based food product that has gained wide acceptance among consumers worldwide for many years. Bread is prepared from a mixture of flour, salt, sugar, yeast and water. However, wheat which is the predominant ingredient for making bread is rich in carbohydrates but low in essential photochemicals and minerals. The quantity and quality of protein in wheat flour are low [1]. Thus, various efforts have been made in enriching bread with legumes, fruits, roots etc to increase the levels of these nutrients in bread [2]. Gayle et al. [3] studied pigeon pea as a protein supplement in bread. Similarly, Harinder and Sharma [4] evaluated the baking properties of wheat/pigeon pea flour blends. The biscuit making potential of millet/pigeon pea flour was also studied by Eneche [5]. Edema et al. [6] suggested the addition of not than 10% protein supplements in order to produce nutritionally balanced acceptable bread.

Pigeon Pea (*Cajanus cajan*) ranks fifth in importance among edible legumes in the world [7,8]. Although, India remains the major producer of pigeon pea, the interest in pigeon pea in other parts of the world is ascribed to its nutritional, medicinal, economical and agronomic usefulness [9]. In Nigeria, the plant is reported as one of the underutilized legumes with broad potentials [10]. Presently, different varieties of pigeon pea are grown in Nigeria. Reports showed that pigeon peas contain 17.9-24.3% protein, 58.7% carbohydrate, 1.2-8.10% crude fiber and 0.6-3.8% fat [7,9]. Pigeon pea is also a good source of calcium, phosphorus, magnesium, iron, sulphur etc [9]. Clinical studies showed the potential of pigeon pea seed based meal in the dietary management of diabetes mellitus and cardiovascular diseases [7]. The pigeon oil was also reported to contain anti-sickling agent [7]. This claim was further supported by the work of Amaefule and Nwagbara [10] in which the extract of *Cajanus cajan* reversed sickling of the erythrocytes.

In spite of its high nutritional qualities, pigeon pea is not a popular in the Western and Northern states of Nigeria. It has no industrial use as at now. Like most tropical legumes, pigeon peas contain antinutritonal substance, such as trypsin inhibitors and tannins which affect their utilization, especially the raw seeds [1]. They also contain flatulence causing oligosaccharides such as starchyose, raffinose and verbacose [11,12]. Similarly, the characteristic problem of hard-to-cook phenomenon also hinders the extensive use of pigeon peas as food. The dried seeds are hard and by the traditional processing methods, it takes 24 hours to prepare a meal of pigeon pea [12]. Various methods have been used to improve the food value of pigeon pea by improving its processing, storage, preservation and utilization. Such methods included germination [8,13], fermentation[12], toasting (Igbedioh et al 1994), boiling [14] etc. The processing methods employed in the preparation of pigeon pea may affect the physicochemical properties of the seeds hence, their potential food application. Moderate heat treatment has been reported to improve the digestibility of plant proteins without developing toxic derivatives and to inactivate several enzymes such as proteases, lipases, lipoxygenases, amylases and other oxidative and hydrolytic enzymes. Roasting is the most significant step in processing of different seeds, that causes important physical, chemical, structural and sensorial changes [11]. The roasting process could promote more flavor, desired color, increased the palatability and improved efficiency of subsequent treatment [14]. One of the main desired outcomes of roasting process is the increase in antioxidant activity that occurs mainly due to the formation of Maillard reaction products [11]. Boiling helped to destroy protease inhibitors and cyanogens in pigeon peas [12]. Toasting and boiling have been reported to enhance taste and flavor of foods [12]. Fermentation gives the food longer keeping quality, develops flavor and decreases anti-nutritional factors in foods [11]. The objective of the study therefore, was to determine the effects of toasting, germination and fermentation of pigeon pea seeds on the quality of bread supplemented with the treated pigeon pea flour.

2. MATERIALS AND METHODS

2.1 Raw Materials

The pigeon pea seeds were purchased from Oja-Oba market in Ijare town, Ondo State. The seeds were cleaned of extraneous materials and stored in jute bags on the laboratory bench prior to use. Wheat flour was purchased from a local market in Idah Township, Kogi State, Nigeia. The wheat hour was screened through a 60 mesh sieve (0.1 mm) (British standard) and stored in high density polyethylene (HDPE) bags (0.77 mm thick) prior to use. All the reagents used in the study were obtained from the Department of Food Science and Technology, Federal Polytechnic, Idah, Kogi State, Nigeria.

2.2 Preparation of Raw Pigeon Pea Flour

The pigeon pea seeds were hydrated in cold water (30±2°C) for 60 min, dehulled manually, oven(HS 20 1A Ezech Republic) dried (60°C, 3 h) and milled in attrition mill (model WN 324,England). The powder was screened through a 60 mesh sieve, packed in HDPF bags and kept on a laboratory bench (30±2°C) until used.

2.3 Preparation Toasted Pigeon Pea Flour

The cleaned pigeon pea seeds were toasted on trays (120°C, 30 min) in an air convection oven with intermittent mixing. The toasted seeds were dehulled manually and the kernels were milled in attrition mill and screened though a 60 mesh sieve.

2.4 Preparation of Boiled Pigeon Pea Flour

The pigeon pea seeds were boiled in hot water (100°C) for 60 min, cooled, dehulled manually, oven dried (60°C, 3 h), milled in attrition mill and sieved through a 60 mesh sieve.

2.5 Preparation of Germinated Pigeon Pea Flour

The pigeon pea seeds were surface sterilized with 1.5% sodium hypochlorite solution followed by soaking in 70% ethanol for 20min as described by Ariahu et al. [15]. The seeds were rinsed thoroughly with tap water and soaked for 6h in tap water. The hydrated seeds were spread evenly on layers of wet jute bags in large petrish dishes (in 3 replicates) and germinated for 5 days in the dark. The jute bags were moistened at regular intervals. The ungerminated seeds were discarded. The sprouted seeds were rinsed with tap water and then oven dried (60°C, 3 h). The kernels were milled in attrition mill and screened through a 60 mesh sieve.

2.6 Preparation of Fermented Pigeon Pea Flour

A portion of the raw pigeon pea flour was mixed with water at 3.2 (water: flour) ratio in a covered plastic bowl as described by Ariahu et al. [15]. The paste was fermented for 5 days, oven dried (60°C, 3 h), milled in attrition and screened through a 60 mish sieve. All the flour samples were stored in high density polyethylene (HDPE) (0.77 mm thick) bags prior to use.

2.7 Preparation of Bread Samples

The wheat flour (90%) was blended with 10% raw treated pigeon pea flour in a Kenwood food processor operated at full speed (1200 rpm) for 5 min. The choice of this level was based on the report of Gayle et al. [3]) and Edema et al. [6] that the maximum level of wheat flour substitution that would produce acceptable bread was 10%.The bread samples were prepared as described by Caserani et al. [16]. The basic formulation used was 100% four, 62% water, 6% sugar, 4% butter, 2% yeast, 2.25% salt and 0.5% dough conditioner. The rubbing in method was adopted for the dry ingredients. The ingredients were weighed appropriately. The yeast was creamed in a basin with some quantity of water. A hole was made in the centre of the flour and the dissolved yeast was added. This was covered with cheese cloth and left at 30°C for the yeast fermentation of the mixture. The remaining water, butter, sugar, salt and dough conditioner were added and kneaded manually until smooth dough free form stickiness was obtained. The dough was returned to the basin, covered with cheese cloth and left at 30°C to proof. The proofed dough was then carefully brushed with egg and was transferred into greased pans and baked at 220°C for 10 mm in a baking oven (SAISHO, Model 993, China). The bread samples were cooled to room temperature and then packed in high density polyethylene (HDPE) bags.

2.8 Chemical Evaluation of Breads

Moisture content was determined by hot air oven drying at 105°C to constant weight [17]. Ash, protein (N x 6.25), crude fiber and fat (solvent extraction) were determined by the AOAC [17] methods. Carbohydrate was calculated by difference as 100-(% Fat + % Moisture + % Crude fiber + % Ash + % Protein). The caloric value of the samples was calculated by multiplying the % protein, fat and carbohydrate contents by Atwater factors of 4, 9 and 4, respectively and then taking the sum [1] The Mg, Ca, Fe and Zn contents were determined using atomic absorption spectrophotometer as described by the AOAC [17] methods.

2.9 Physical Evaluation of Breads

The weight of the bread was determined with electronic weighing balance. The height, length and width of samples were measured using vernier caliper. The proofing (leavening) ability of bread was calculated by subtracting the initial height of the dough before leavening from the final height after leavening and then multiplying the result by 100. The oven spring was determined as the difference in dough height before and after baking [18]. The loaf volume was calculated as height x length x width [18]. The specific volume was calculated as loaf volume /loaf weight.

2.10 Sensory Evaluation of Breads

Bread samples including 100% wheat flour bread were evaluated for color, flavor, texture taste and overall acceptability by a panel of 20 trained panelists on 5-point Hedonic scale (1 = dislike extremely and 5 = like extremely) [1]. The panelists consisted of members of staff of the Department of Food science and Technology, Federal Polytechnic, Idah, Kogi State, Nigeria. The sensory evaluation was carried out in the mid morning (10 am) in the sensory evaluation laboratory under adequate controlled conditions of adequate lighting and ventilation. Movements and other sources of distraction were controlled. The samples were presented to the panelists in three-digit coded plain white plastic plates. The order of presentation of the samples to the panelists was randomized. Tap water was provided in glass tumblers for the panelists to wash their hands and to rinse their months in between evaluations.

2.11 Statistical Analysis

The data were analyzed by analysis of variance in completely randomized designed using Statistical Package for Social Sciences (SPSS) soft ware version 17, 2007 .The least significant difference (Lsd) test was used to separate significantly different means. Significance was accepted at $P < 0.05$.

3. RESULTS AND DISCUSSION

3.1 Physical Properties of Bread

The physical properties of breads prepared from blends of wheat flour and raw/treated pigeon pea flours are shown in Table 1.The fermentation of pigeon pea flour failed to increase the height of bread containing pigeon pea flour while germination of the seed exerted greater increases on height of bread containing pigeon pea flour over the other treatments. The height of the loaf increased from 4.0 cm for the bread containing raw pigeon pea flour to 6.0 cm in the bread containing germinated flour. The height of breads containing toasted pigeon pea seed flour (5.5 cm) and germinated pigeon pea seed flour (6.0 cm) were not significantly different ($P>0.05$) from that of 100% wheat flour bread (control) (5.6 cm). The length and width of breads were not significantly ($p>0.05$) affected by the treatments. The length of bread containing raw pigeon pea seed flour was 14.3 cm and ranged between 13.8 and 14.0 cm for the breads containing treated flours. These values were comparable to 13.8 cm for the 100% wheat flour bread. Bread supplemented with toasted pigeon pea flour (221 g) was heavier than those of the other samples (194.7-216 g). This was closely followed by the 100 % wheat flour bread (216 g). Loaf weight is determined by the quantity of dough baked and the amount of moisture and CO_2 diffused out of the loaf during baking [19]. The bread containing germinated had higher specific volume (3.195 cm^3) and oven spring (1.50 cm) than the other bread samples. The germinated pigeon pea flour based bread was also better in these properties than the 100% wheat flour bread. High loaf weight and volume have positive economic effect on bread at the retail end [20]. Loaf weight reduction during baking is undesirable economic quality to the bakers as consumers often get attracted to bread loaf with higher weight and volume, believing that it has more substance for the same price [20]. Germination of the pigeon pea improved the bread volume over other treatments. The germination may have caused the breakdown of macromolecules such as starch, protein and fiber in the flour which probably provided good substrates during dough fermentation. The specific volume which is the ratio of the loaf volume to the loaf weight is generally used as reliable measure of loaf size [19]. Loaf volume is affected by the quantity and quality of protein in the flour as well as the proofing time [18].

3.2 Sensory Properties of Breads

Table 2 presents the effects of the treatments on the sensory properties of breads supplemented with pigeon pea seed flour. Only germination improved the color, flavor, texture and overall acceptability of the bread. The bread containing germinated pigeon flour was preferred to other breads containing pigeon pea flour in overall acceptability and all the sensory attributes studied. Interestingly, bread containing germinated pigeon pea flour was not significantly different (P>0.05) from the 100% wheat flour bread in all the sensory attributes evaluated. In addition to the use of germinated pigeon flour in bread as a protein supplement in, it will also reduce the overdependence on the use of wheat flour. Toasting influences physical, chemical and functional properties of crop [11]. Toasting is accompanied with caramelization of sugar polysaccharides and Maillard reactions of reducing sugars and proteins of food materials [12]. These reactions generate flavor and color which may enhance the acceptance of food products [11]. The toasting of the pigeon pea seeds and baking of the bread dough adversely affected the color and flavor of the bread containing toasted pigeon pea flour. Germination modified the structure of pigeon seeds via starch hydrolysis which gave improved taste and texture to the bread containing germinated pigeon pea flour [15 ,21]. Complex carbohydrates are broken down to organic acids and simpler substances during fermentation [22] .These break down products may have adversely affected the sensory properties of bread containing fermented pigeon pea flour which had the lowest scores relative to other breads for all the sensory attributes including overall acceptability.

Table 1. Effect processing treatments on the physical properties of breads supplemented with pigeon pea flours

Physical properties	Raw	Toasting	Bead samples boiled	Germinated	Fermented	Wheat
Height (cm)	4.0^c	5.5^b	4.8^c	6.0^a	4.0^c	5.6^b
Length (cm)	14.3^a	14.0^a	13.5^b	14.0^a	13.9^b	13.0^b
Width (cm)	7.7^a	7.5^a	7.5^a	8^a	7.5^a	7.6^a
Weight (g)	194.7^f	221.19^a	196.8^e	210.3^c	200.8^d	216^b
Proofing ability (%)	50.0^c	50.0^c	33.3^d	60.7^b	66.7^a	60.7^b
0ven spring(cm)	0.5^a	1.0^a	0.88^a	1.5^a	1.0^a	0.6^a
Volume(cm^3)	440.44^d	577.5^b	485^c	672^a	417^e	553.28^{bc}
Specific volume(cm^3/g)	2.262^b	2.693^b	2.464^b	3.195^a	2.077^b	2.561^b

Means (n=3) within a row with the same superscript were not significantly different (P > 0.05). Breads were prepared from 90% wheat flour and 10% pigeon pea flour blend

Table 2. Effect of processing treatments on sensory properties breads supplemented with pigeon pea flours

Bread	Colour	Flavour	Texture	Taste	Overall acceptability
Wheat	4.50^a	4.6^a	4.5^a	4.6^a	4.5^a
RPPF	4.5^a	3.3^b	3.3^b	3.0^b	3.4^b
TPPF	3.5^a	3.6^b	3.6^b	3.2^b	3.1^b
BPPF	3.3^b	3.6^b	3.6^b	3.3^b	3.0^b
GPPF	4.3^a	4.2^a	4.1^a	4.2^a	4.1^a
FPPF	2.9^b	2.4^b	2.4^c	2.1^c	1.7^b
$Lsd_{0.05}$	1.13	1.06	0.08	1.23	0.76

Means (n=3) within a column with the same superscript were not significantly different (P>0.05). Breads were prepared from 90% wheat flour and 10% pigeon pea flour blend and evaluated on a 5-point Hedonic scale (1 = dislike extremely and 5 = like extremely): RPPF= raw pigeon pea flour, TPPF= toasted pigeon pea flour, BPPF= boiled pigeon flour, GPPF= germinated pigeon pea flour, FPPF=fermented pigeon pea flour.

3.3 Proximate of Composition of Breads

The effects of the various treatments on the chemical composition of the treated flours breads supplemented with pigeon flours are shown in Tables 3 and 4, respectively.

All the treatments except toasting increased the moisture contents of the breads (Table 4) .The moisture contents of the breads varied from 15 to 18% which were within the range of moisture recommended for breads [18] .Only toasting increased the ash content of the pigeon pea. High ash content of foods has implication for mineral values .The decrease in fat contents of the bread containing fermented and germinated flours might be attributed to the increased activities of the lipolytic enzymes during fermentation and germination of the pigeon seeds which hydrolyzed fat components into fatty acid and glycerol [23,24]. The fat in the seeds was probably utilized for the energy need of the microorganisms which were activated during fermentation and germination [21]. Leaching during boiling of the seeds may have been responsible for the decrease in fat content of the breads containing boiled pigeon pea flour. The increase in the fat content of the bread containing toasted flour over the other treated flours was due to the greater loss in the moisture content of the toasted flour. The crude protein contents of the breads containing treated pigeon pea flours ranged between 24.1% in the biscuit containing boiled pigeon flour and 27.3% in the biscuit containing germinated flour. These values were higher than that of 12.4% for wheat flour biscuit. Synthesis of new protein was reported to occur during fermentation [8,23] Activities of proteolytic bacteria during fermentation were reported to improve the digestibility and availability of proteins due to the breakdown of protein-tannin and protein-phytate complexes [15] . High proteolytic activity in germinating millet grains was reported by Hamad and Fields [25] . Germination may have increased the amino acids content of the pigeon pea seed storage protein in this study. Hamad and Field [25] reported significant improvement in the protein content of sorghum and other grains during malting. Complementing wheat flour with the treated pigeon pea flours is a means of not only increasing the protein value of bread but also its micronutrient worth because most protein foods are rich sources of micronutrients such as zinc, iron, and copper [1] .Children and adolescents are especially in need of protein and micronutrients [1]. Consumption of breads containing the variously treated pigeon pea flours would contribute immensely to the fight against protein and micronutrient deficiencies. Only toasting and germination of the pigeon seeds increased the crude fiber contents of the biscuits. Similarly, the crude fiber content of wheat flour biscuit was lower than those of the breads containing pigeon pea flours. The increase in the crude fiber content of the bread containing germinated pigeon pea flour may be attributed to the synthesis of more of the cell wall material during the germination of the seeds to support the roots and rootlets [22] .On the other hand, toasting concentrated the crude fiber content of the seed by loss of moisture Fiber is known for its health implications. It enhances intestinal motility and the activities of probiotics, reduces blood sugar and prevents colon and rectal cancers [26]. Disease in certain diseases such as diverticulosis and colonic cancer has been associated with increased fiber consumption [26]. Dietary fiber acts as bulking agent and thus, increases intestinal motility and wet faecal mass of faeces [26].These effects help in reducing diseases of the colon [26]. Some reports showed that some plant fibers can lower serum cholesterol [26].The carbohydrate contents of the breads containing treated pigeon pea flour were higher than that of the bread containing raw pigeon pea flour probably due to leaching of soluble solids during the boiling of the seeds. Carbohydrates in the breads containing treated pigeon pea flours would provide readily available glucose for energy production to meet the high activity level of children and adolescents.

3.4 Mineral Composition of Breads

The effects of the processing treatments on mineral composition of breads supplemented with pigeon flour are shown in Table 5.The mineral contents of the breads were significantly ($p<0.05$) affected by the processing treatments. The mineral contents of all the biscuits except that containing toasted pigeon pea flour were lower than those of the raw pigeon pea flour.

However, all the pigeon pea flour based breads contained higher amounts of minerals than the wheat flour biscuit. Micronutrient content of the pigeon based breads is an indication of good nutritional quality. Micronutrients play significant roles in many body processes. Consumption of foods rich in micronutrients and photochemical is associated with good health. The US RDA for iron is 10-15mg per day [27]. The levels of iron lend the pigeon pea based biscuits good sources

Table 3. Effect of treatments on the proximate composition of pigeon pea seed flour

Composition (%)	Raw	Toasted	Boiled	Germinated	Fermented	Wheat
Moisture	10.5^a	9.0^b	11.0^a	10.9^a	10.7^a	10.0
Crude protein	23.0^b	24.9^a	22^c	25.4^b	24.8b	10.0
Ash	2^a	3.8^b	1.5^a	1.7^a	1.8^b	1.2
Fat	5.3	4.5	4.0	4.1	3.9	2.0
Crude fiber	1.5	1.8	1.3	2.0	1.4	2.0
Carbohydrate	57.7^a	56.3^a	60.2^a	55.9^a	57.4^a	74.8

Means (n=3) within a row with the same superscript were not significantly different (P>0.05).

Table 4. Effect of processing treatments on the proximate composition of breads supplemented with pigeon pea seed flours

Composition (%)	Raw	Toasted	Boiled	Germinated	Fermented	Wheat bread
Moisture	17^b	15^{cd}	18^a	16^c	15.5^c	16^c
Crude protein	25.9^c	26.8^a	24.1^d	27.3^b	25.6^c	12.4^e
Ash	3.1^b	4.2^a	2.4^c	3.9^b	3.2^b	1.5^d
Crude fiber	2.3^a	2.4a	2.1^a	2.0^a	2.1a	2.0^a
Fat	14.7^a	13.0^b	12.3^c	11.4^d	12.6^c	8.7^e
Carbohydrate	60.0^c	63.8^b	59.9^b	65.9^a	65.0^a	59.4^d

Means (n=3) within a row with the same superscript were not significantly different (p>0.05)

Table 5. Effect of processing treatments on the mineral composition of breads supplemented with pigeon pea flour

Mineral (Mg/100 g)	Raw PPF	Toasted PPF	Boiled PPF	Germinated PPF	Fermented PPF	Wheat flour bread
Mg	146^c	151.9^a	146^c	136e	149b	142d
Ca	113^b	117^a	107^d	98e	108c	28f
Fe	6.9^b	7.5^a	5.9^c	5.0^c	5.4^c	4.9^d
Zn	4.7^b	6.2^a	3.8^d	3.6^d	4.9^c	3.2^d

Means (n=3) within a row with the same superscript were not significantly different (p>0.05)

of iron. Iron is very important in blood building. Deficiency of iron is the most common nutritional disorder in the world, causing anaemia that affects more than 3.5 million people in the developing world [28]. Magnesium is an essential constituent of all cells necessary for the functioning of enzymes involved in energy utilization and it is present in the bone [29].

Deficiency of Mg is rare and results from excessive losses in diarrhea rather than from low intakes. Zinc is needed by over 300 enzymes, some of which are involved with metabolism of blood sugars [11]. Zinc is so important that lack of it causes Types 1 and Type II diabetes [29]. Meals rich in zinc protect the body from inflammatory signals that damage beta cells [29]. The RDA for zinc for all groups is 15mg, thus, consuming 200 g of pigeon pea flour based biscuits would provide the RDA for zinc [1].

4. CONCLUSIONS

The results of this study showed that germinated pigeon pea flour could replace 10% wheat flour in yeast raised bread without adversary affecting the physical and sensory characteristics of the bread. Boiling, boasting, germination and fermentations had no adverse effects on the physical and sensory properties of breads supplemented with pigeon pea flour. The pigeon pea four based breads had similar physical properties with the 100% wheat flour bread. There were no significant differences in the sensory properties of the breads containing pigeon pea flour. The breads containing pigeon pea flours were not significantly different from that of wheat flour biscuit in the sensory properties. However, germination improved the sensory attributes of the biscuits containing pigeon pea flour more than the other treatments.

This study has opened a new food of application for pigeon pea seeds. This is of interest in non–wheat producing counties like Nigeria. It is also of interest in child feeding programmes.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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