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EVALUATION OF THE CHEMICAL COMPOSITION AND SENSORY PROPERTIES OF SOY-*AGIDI* FORTIFIED WITH *Alternanthera brasiliana* POWDER

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Abstract
Weaning foods are nutritionally balanced foods introduced to infants after six months. High cost of nutritious proprietary weaning foods such as SMA promilk, and Similac; that are beyond the reach of most less privileged families in developing countries like Nigeria. Therefore, this has necessitated the fortification of locally available weaning food such as *agidi*. In this study, chemical composition and sensory properties of soy-agidi fortified with *Alternanthera brasiliana* were investigated. Maize grains and soybean seeds used were purchased from Ubani Main market in Umuahia North Local Government Area, while fresh leaves of *A. brasiliana* was obtained from a farm in Umudike, all in Abia State. One (1) kg of maize was sorted and steeped in portable water for 5hrs intermittently. The steeped maize was wet milled in a milling machine, sieved using a clean muslin cloth, decanted and pressed with cheese cloth to obtain maize slurry. Exactly 1kg of soybean seeds were sorted, blanched and soaked into 5% $NaHSO_3$ solution for 6hrs with change in water at intervals. The hulls were removed by water floatation and cotyledons obtained were milled into paste. The *A. brasiliana* leaves were sorted, washed, dried in oven at 50°C for 5hrs and ground to obtain *A.brasiliana* powder. Agidi samples were formulated with different blends of maize, soybean and *Alternanthera brasiliana* powder respectively (100:0:0, 80:10:10, 70:20:10, 60:30:10, and 50:40:10). The blends were mixed with 300ml of water each, cooked in 1000ml of boiling water for 10min. Agidi sample prepared from 100% maize served as control. The chemical composition and sensory properties of the Agidi samples were evaluated with standard methods. Results obtained showed that the chemical composition of the Agidi samples ranged from 16.36 to 19.84%, 10.64 to 29.05%, 0.81 to 3.46%, 3.98 to 9.83%, 0.87 to 2.42%, 38.88 to 63.86%, 3.64 to 4.77mg/100g, 33.55 to 45.08mg/100g, 3.02 to 6.64mg/100g, 163.34 to 302.02µg/100g, 0.72 to 13.37mg/100g for moisture content, crude protein, crude fibre, fat, ash, carbohydrate, iron, calcium, zinc, vitamin A and vitamin C respectively. Agidi sample from 100% maize was the most preferred, followed by sample from 80% maize, 10% soybean and 10% *A. brasiliana* in that order.

Keywords: Chemical composition, sensory properties, soy-agidi, A.brasiliana powder

Introduction

Weaning foods are specially prepared family meals be it solid, semi-solid or liquid introduced to infants after six months of age, while continuing breast feeding for up to two years or more (Krebs, 2014). Weaning foods are nutritionally similar to breast feeding. They are expected to be high in energy density, all essential amino acids, vitamins and minerals, while retaining the qualities for palatability (Abeshu *et al*., 2016). In Nigerian households, foods such as *agidi* (cereal starch pudding) prepared from maize, millet or guinea corn is commonly used as weaning food (Ukegbu *et al*., 2015). Agidi has added advantage over so many cereal based weaning foods in that it could be prepared long before use and can be eaten alone in solid or semi-solid form.

Soybean (*Glycine max*) belongs to the family leguminosae and sub-family papillionndideae. Soybean is said to have more protein than beef, more calcium than milk and more of a fatty substance called lecithin than eggs (Ugwu and Nwoke, 2011). It contains high amounts of minerals like iron, phosphorus, magnesium and potassium. It is also quite rich in calcium (Parle *et al*., 2014). Soybean possess multifarious health benefits (Parle *et al*., 2014; Kusuma, 2015), and has been reported to have the potential to eradicate malnutrition related problems (Amusat and Ademola, 2013). Generally, soybean is considered as a highly versatile grain which has about 365 applications in formulation of human and animal foods (Omotayo *et al*., 2007). Due to the exceptional nutritional value, health benefits and taste of soybean, numerous researchers have incorporated it in diverse weaning foods (Abiose *et al*., 2015; Okwunodulu and Okwunodulu, 2016; Barber *et al*., 2017; Obinna-Echem *et al*., 2018).

Maize or corn (*Zea mays* L.) is an important annual cereal crop of the world belonging to the family Poaceae. Its kernel is an edible and nutritive part of the plant. Maize germ is rich in glutelin accounting for 49-54% of the total protein of germ. Maize contains fat, supplying an energy density of 365kcal/100g (Nuss and Tanumihardjo, 2010).Vitamin E, vitamin C, vitamin K, vitamin B_1 (thiamine), vitamin B_2 (niacin), vitamin B_3 (riboflavin), vitamin B_4 (Pantothenic acid), vitamin B_6 (Pyridoxine), folic acid, and selenium (Kumar and Jhariya, 2013). Carbohydrate and vitamin A (yellow) are well provided by maize (Adeyeye and Akingbala, 2014). Maize is a fairly good source of phosphorus, contains an appreciable amount of iron, but is low in calcium (Shakuntala and Shasaksharaswamy, 2008). Potassium is a major nutrient present in maize which has diuretic properties (Shah *et al*., 2016). *A. brasiliana* is an evergreen perennial herb, native to tropical and sub-tropical regions of Australia and South America (Firoj *et al*., 2012). Recent scientific publication revealed that *A. brasiliana* contains components that will impact positively on the health of the infants when used to formulate weaning foods (Attaugwu and Uvere, 2017).

Breast milk is an ideal food for the healthy growth and development of all normal infant during the first six months of life. However, at the age of six months and above when the age of the child's birth weight is expected to have doubled, breast milk is no longer sufficient to meet the nutritional needs of the growing infant. Commercially available weaning foods in most developing countries like Nigeria are too expensive for average families (Obiakor-Okeke *et al*., 2014; Okwunodulu and Abasiekong, 2015). Many situations such as high prevalence of malnutrition in infants and young children (WHO, 2012), and high cost of fortified nutritious proprietary, weaning foods such as Similiac, SMA pro milk and Gerber cereal are beyond the reach of most average families in developing countries such as Nigeria (Okwunodulu and Abasiekong, 2015). This has necessitated fortification of locally available weaning foods such as *agidi*. More so, there is need to provide information on the usefulness of locally available staples in formulation of weaning foods. This study aimed at evaluating the chemical and sensory properties of soy-agidi fortified with *A. brasiliana.*powder.

Materials and Methods

Source of Raw Materials

Maize grains and soybean seeds that were used to produce *agidi* were purchased from Ubani main market in Umuahia North Local Government Area, while fresh leaves of *A. brasiliana* was obtained from a farm in Umudike, Ikwuano Local Government Area, all in Abia State. All reagents that were used for analysis was obtained from the Biochemistry Laboratory of National Root Crops Research Institute Umudike, Abia State.

Sample Preparation

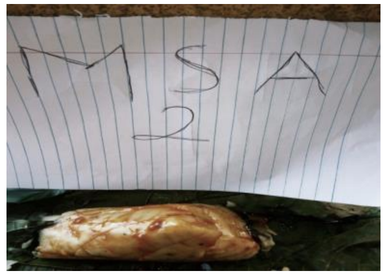
***Production of maize slurry*:** The method described by Adegbehingbe (2013) was used in production of maize slurry. The maize grains were sorted to remove dirt and spoilt grains from the healthy ones. One kilogram (1kg) of the maize was soaked (or steeped) in four litres of portable water for 96hours. The water was then decanted, grains washed and separately wet milled in a milling machine (Philips grater, Model HR2001/70/AC 220-240V-50/60Hz/350W) with addition of 2 litres (2L) of portable water each. The milled grains were then sieved using a clean muslin cloth, decanted and pressed using cheese cloth to obtain maize slurry.

Production of soybean paste : The method described by Oguche *et al*. (2017) was used in production of soybean paste. One kilogram (1 kg) of whole soybean seeds were sorted, blanched and soaked in 0.5% $NaHSO_3$ solution for 6hrs. The hulls and the shoots were removed by water floatation and the cotyledons obtained were milled into paste.

***Production of A. brasiliana powder*:** *A. brasiliana* powder was produced using the method of Nwosu *et al.* (2014). The leaves were sorted, washed with portable water and drained. Thereafter, they were dried in oven (Gallenkamp BS oven, model 320) (at 50 ºC for 5hrs) and pulverized to obtain *A. brasiliana* powder.

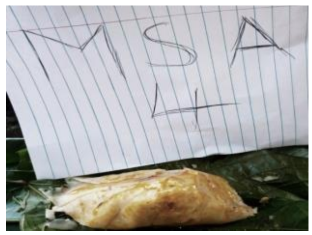
Formulation, composition and preparation of soy-agidi fortified with A. brasiliana powder: Five different samples of *agidi* containing different percentage ratio of soybean and constant percentage ratio of *A. brasiliana* as stated below were processed using the method described by Oguche *et al*. (2017). Slurry made from 500g of sediment maize filtrate, soybean paste and *A. brasiliana* powder mixed with 300ml of potable water was added to 1000ml of boiling water with continuous stirring (for about 10min) until a thick paste was formed. The prepared samples were divided into 2 parts. One part was used for sensory evaluation, while the other part was used for chemical test. The sample for chemical test was dried at 65°C for 24hrs in an oven (Gallenkamp BS oven, model 320), after which it was ground and sieved using 0.4mm screen mesh. The filtrate was collected in an air tight container and taken for chemical analysis.

MSA1-100% Maize slurry
MSA2-80% Maize slurry, 10% Soybean paste, 10% *A. brasiliana* leaves powder
MSA3-70% Maize slurry, 20% Soybean paste, 10% *A. brasiliana* leaves powder
MSA4-60% Maize slurry, 30% Soybean paste, 10% *A. brasiliana* leaves powder
MSA5-50% Maize slurry, 40% Soybean paste, 10% *A. brasiliana* leaves powder



MSA1-100% Maize slurry

MSA2-80% Maize slurry, 10% Soybean paste, 10% *A. brasiliana* leaves powder



MSA3-70% Maize slurry, 20% Soybean paste, 10% *A. brasiliana* leaves powder

MSA4-60% Maize slurry, 30% Soybean paste, 10% *A. brasiliana* leaves powder

MSA5-50% Maize slurry, 40% Soybean paste, 10% *A. brasiliana* leaves powder

Plate 1: Soy-*agidi* samples

Chemical Analysis

Determination of Proximate Composition of Soy-agidi Samples: For proximate analysis, the moisture, ash, crude fiber, fat and crude protein content of the *agidi* were determined as described by AOAC (2010). The total carbohydrate content was determined by difference.

Determination of Mineral Content of Soy-agidi Samples

Determination of calcium: Calcium content of the digested sample was determined by EDTA complexiometic titration method as described by James (1995).

Determination of zinc: Zinc was determined by the method of AOAC (2010).

Determination of Iron: The Iron content was determined by spectrophotometric method of James (1995).

Determination of Vitamin Content of Soy-agidi Samples

Determination of vitamin A: The spectrophotometric method described by Onwuka (2005) was employed in the determination of vitamin A.

Determination of vitamin C: The method used was as described by Okwu and Josiah (2006).

T = Sample titre – blank titre

Sensory Evaluation

The method of Iwe (2002) was used to evaluate the soy-*agidi* based on certain attributes such as appearance, flavour, taste, texture and general acceptability. The soy-*agidi* samples were evaluated by 25 panelists randomly selected among students of Michael Okpara University of Agriculture, Umudike. The untrained panelists were instructed prior to the exercise. The samples were presented in identical packaging materials labeled with appropriate codes. Portable water was served to the panelists to use in rinsing their mouth after each tasting so as not to interfere with the taste of the preceding samples. Quality attributes of the soy-*agidi* were evaluated based on a 9 point Hedonic scale. The degree of likeness was expressed as follows: like extremely (9), like very much (8), like moderately (7), like slightly (6), neither like nor dislike (5), dislike slightly (4), dislike moderately (3), dislike very much (2), dislike extremely (1). Like extremely to like slightly constitute good, while dislike slightly to dislike extremely constitutes poor. Neither like nor dislike indicates that the product was neither good nor bad.

Statistical Analysis

All experiments in this study were reported as mean of duplicate analyses. One way analysis of variance of a completely randomized design (CRD) using the Statistical Package of Social Science version 23 was carried out to compare between the mean values, while treatment means was separated using Duncan multiple range test at 95% confidence level ($p<0.05$).

Results and Discussion

Proximate Composition of Soy-agidi Samples

The results of proximate analysis of the soy-*agidi* fortified with *A. brasiliana* powder are presented in Table 1. The crude protein content of the soy-*agidi* samples ranged from 10.64 to 29.05%. Sample MSA5 had the highest crude protein (29.05%), while sample MSA1 had the least crude protein (10.64). It was observed that increase in proportion of soybean paste caused significant differences ($p<0.05$) in protein content of the soy-*agidi* samples. Protein is crucial to the regulation and maintenance of the body of infants and young children. The range of crude protein obtained in this study is higher than 8.92% reported by Oguche *et al*. (2017) for *agidi* produced from 100% maize and 20.63% for agidi produced from maize supplemented with soybean flour. More so, the range of crude protein obtained in this study is higher than 8.92 to 20.77% of crude protein obtained from *agidi* produced from fermented maize and full fat soy flour (Ikya *et al*., 2013). The moisture content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 16.36 to 19.84%. It was observed that there were significant differences ($p<0.05$) in the moisture content between blends. Sample MSA1 recorded the highest moisture content (19.84%), while sample MSA5 had the least moisture content (16.36%). This is in line with the findings of Oguche *et al*. (2017) who reported a 100% reduction in moisture content of *agidi* as a result of fortification with soybean flour. This could be attributed to the presence of protein because protein binds water. The crude fibre content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 0.86% to 3.46%. Sample MSA5 had the highest crude fibre (3.46%), while sample MSA1 recorded the least (0.81%). It was observed that increase in proportion of soybean paste resulted to significant ($p<0.05$) increase in the crude fibre of the soy-*agidi* samples. This could be attributed to the positive contributions of soybean. Esteves *et al*. (2010) reported that soybean contains substantial amount of crude fibre. Fortification of soy-*agidi* with *A. brasiliana* powder which Attaugwu *et al*. (2017) reported to have high content of fibrous material might have contributed to its higher crude fibre content. The fat content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 3.98 to 9.83%. There were significant differences ($p<0.05$) between the fat contents of the soy-*agidi* samples. Fat content of soy-*agidi* samples were observed to increase with increase in proportion of soybean paste. The range of fat content of 3.98% obtained in this study for *agidi* produced from 100% maize is lower than the 4.85% value reported by Oguche *et al*. (2017) for *agidi* produced from 100% maize, while values obtained from soy-*agidi* fortified with *A. brasiliana* powder (6.88 to 9.83%) is higher than that obtained from maize supplemented with soybean flour (7.71%). Contribution of fat by the soybean agrees with the recommendations of FAO/WHO (1998) that vegetable oils be included in foods meant for infants and children, which will not only increase the energy density, but also be a transport vehicle for fat soluble vitamins. The ash content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 0.87 to 2.42%. The results show that there were significant differences ($p<0.05$) between the ash content of the soy-*agidi* samples. Sample MSA5 had the highest ash content of 2.42%, while sample MSA1 recorded the least ash content of 0.87%. It was observed that increase in proportion of soybean paste resulted to increase in ash content. This result is in agreement with the findings of Olaoye *et al*. (2006) and Sanful *et al*. (2010). The carbohydrate content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 38.88% to 63.86%, indicating significant differences ($p<0.05$) among the carbohydrate content of the samples. Sample MSA5 recorded the least carbohydrate content of 38.88%, while sample MSA1 recorded the highest ash content of 66.86%. The high carbohydrate content of MSA5 could be attributed to high carbohydrate content of Maize (Shah *et al*., 2015). A decrease was observed in the carbohydrate content of the *agidi* as proportion of soybean paste increased. This may be attributed to the low carbohydrate content of soybean as reported by Iwe (2003).

Table 1: Proximate Composition of Soy-*agidi* Samples (%)

Sample	Moisture content	Crude protein	Crude fibre	Fat	Ash	Carbohydrate
MSA1	$19.84^{a}\pm0.01$	$10.64^{e}\pm0.01$	$0.81^{e}\pm0.01$	$3.98^{e}\pm0.03$	$0.87^{e}\pm0.01$	$63.86^{a}\pm0.04$
MSA2	$19.14^{b}\pm0.01$	$17.81^{d}\pm0.01$	$2.23^{d}\pm0.01$	$6.88^{d}\pm0.01$	$1.43^{d}\pm0.01$	$52.51^{b}\pm0.01$
MSA3	$18.41^{c}\pm0.01$	$21.55^{c}\pm0.01$	$2.63^{c}\pm0.00$	$2.63^{c}\pm0.00$	$8.27^{c}\pm0.01$	$47.39^{c}\pm0.01$
MSA4	$17.67^{d}\pm0.01$	$25.31^{b}\pm0.01$	$3.03^{b}\pm0.00$	$9.65^{b}\pm0.01$	$2.08^{b}\pm0.01$	$42.26^{d}\pm0.01$
MSA5	$16.36^{e}\pm0.01$	$29.05^{a}\pm0.01$	$3.46^{a}\pm0.00$	$9.83^{a}\pm0.01$	$2.42^{a}\pm0.01$	$38.88^{e}\pm0.04$

a-e: Values are means ± standard deviation of duplicate determination. Mean values in the same column with different superscript are significantly different ($p<0.05$)

Keys: MSA1= 100% Maize slurry, MSA2= 80% Maize slurry, 10% Soybean paste, 10% A. brasiliana powder, MSA3= 70% Maize slurry, 20% Soybean paste, 10% A. brasiliana powder, MSA4 = 60% Maize slurry, 30% Soybean paste, 10% A. brasiliana powder, MSA5= 50% Maize slurry, 40% Soybean paste, 10% A. brasiliana powder.

Mineral Composition of Soy-agidi Samples

Mineral composition of soy-*agidi* fortified with *A. brasiliana* powder are presented in Table 2. The zinc content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 3.02mg/100g in sample MSA5 to 6.64mg/100g in sample MSA1. There were significant differences ($p<0.05$) between the zinc content of all the samples. Higher zinc content recorded in sample MSA1 could be attributed to the fact that maize used in preparation of the samples has higher zinc content. The range of zinc obtained in this study is higher than 0.81 to 3.54mg of zinc reported by Aduke (2017) for complementary food produced from maize, soybean and plantain, and 2.55mg/100g of zinc reported for cerelac; a well known commercial complementary food in Nigeria (Mahmoud and Anamy, 2014). Calcium content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 33.55mg/100g in MSA5 to 45.08mg/100g in sample MSA1. There were significant differences ($p<0.05$) between the calcium content of the samples. It was observed that calcium content of the samples decreased with increase in the proportion of soybean. This implies that maize used in the preparation of soy-*agidi* posses higher calcium content than soybean. The value of calcium obtained in this study is higher than 20 to 31mg of calcium content reported for infant food from soy-*acha* (Ugwuona *et al*., 2012), 6.44 to 12.14mg for gruel formulated from sorghum, soybean, plantain (Onoja *et al*., 2014), and 18.01 to 25.10mg for malted millet, plantain and soybean complementary food (Islamiyat *et al*., 2016). Higher calcium content obtained in this study could also be attributed to the positive effect of *A. brasiliana* leaf which Attaugwu *et al*. (2017) reported to contain substantial amount of calcium to serve as fortificants to meet the recommended daily allowance of complementary food. The iron content of the soy-*agidi* fortified with *A. brasiliana* powder ranged from 3.64mg/100g in sample MSA5 to 4.77mg/100g in sample MSA1. There was significant differences ($p<0.05$) between the samples. Increase in proportion of soybean paste resulted to decreased iron content of soy-*agidi*. This could possibly mean that soybean is not a good source of Iron. Iwe (2003) affirmed that Iron is a minor mineral in soybean. Iron has been reported to be an important component of the red blood cell, and enhances the oxygen-carrying capacity of the red blood cells (Agbon *et al*., 2009). The range of iron obtained in this study is within 3.2 to 5.8mg/100g reported for complementary food made from millet, soybean and locust bean fruit pulp blends (Zakari *et al*., 2018), and above 0.83 to 3.01mg/100g reported for 10 commonly consumed traditional complementary foods in Nigeria (Ogbonnaya *et al*., 2018). Higher values of Iron recorded in this study could be attributed to inclusion of *A. brasiliana* powder which Attaugwu *et al*. (2017) reported to contain substantial amount of iron to serve as fortificants to meet the recommended daily allowance value of complementary food.

Table 2: Mineral Composition of Soy-*agidi* Samples (mg/100g)

Sample	Iron	Calcium	Zinc
MSA1	$4.77^{a}\pm0.01$	$45.08^{a}\pm0.01$	$6.64^{a}\pm0.01$
MSA2	$4.47^{b}\pm0.01$	$43.66^{b}\pm0.01$	$4.98^{b}\pm0.01$
MSA3	$4.31^{c}\pm0.01$	$37.51^{c}\pm0.01$	$4.31^{c}\pm0.01$
MSA4	$3.98^{d}\pm0.01$	$34.88^{d}\pm0.01$	$3.85^{d}\pm0.01$
MSA5	$3.64^{e}\pm0.01$	$33.55^{e}\pm0.01$	$3.02^{e}\pm0.01$

Vitamin Composition of Soy-agidi Samples

Vitamin composition of the soy-*agidi* fortified with *A. brasiliana* powder are presented in Table 3.Vitamin C content of the soy-*agidi* ranged from 0.72 to 13.37mg/100g. There was significant differences ($p<0.05$) between the vitamin C content of the soy-*agidi* samples. Sample MSA5 recorded the highest vitamin C content (13.37mg/100g), while sample MSA1 had the least vitamin C content (0.72mg/100g). Increase in vitamin C content of soy-*agidi* with increase in substitution level of the samples could possibly be that soybean possesses higher vitamin C. Vitamin C has been identified with some health benefits such as prevention of scurvy development; a deficiency disease characterized by weakness, anaemia, swollen joints, bleeding gums and loose teeth (MedicineNet, 2011). The range of vitamin C obtained in this study is higher than 1.61 to 7.43mg/100g reported for complementary food from maize, soybean and plantain, 2.09 to 3.92mg/100g reported for complementary food from maize, millet and soybean (Akinsola *et al*., 2017), and even 2.34mg/100g reported for cerelac, a well- known commercial complementary in Nigeria (Ezeokeke and Onuoha, 2016). Higher vitamin C obtained in soy-*agidi* might be that *A. brasiliana* powder which was incorporated as a fortificant contains traces of vitamin C. Iwe (2010) noted that proper complementing of indigenous grown crops will provide relatively complementary foods that could possibly be more nutritious than commercial complementary. Vitamin A content of the soy-*agidi* ranged from 163.34 to 306.02mg/100g. There were significant differences ($p<0.05$) between the vitamin A content of the soy-*agidi* samples. Sample MSA5 recorded the least vitamin A content (163.34 mg/100g), while sample MSA1 had the highest (306.02mg/100g). Decreased vitamin A content of soy-*agidi* with increase in soybean paste could possibly be that maize has higher vitamin A. Vitamin A is an important micronutrient in complementary foods, and its deficiency is of public health concern. The range of vitamin A obtained in this study is lower than 2691 to 3137μg/100g reported for complementary food from maize, millet and soybean (Akinsola *et al*., 2017).

Table 3: Vitamin Composition of Soy-*agidi* Samples

Sample	Vitamin A (µg/100 g)	Vitamin C (mg/100 g)
MSA1	306.02^{a}±0.01	0.72^{e}±0.01
MSA2	254.93^{b}±0.01	4.84^{d} ±0.01
MSA3	224.38^{c}±0.01	7.66^{c}±0.01
MSA4	193.84^{d} ±0.01	10.48^{b} ±0.01
MSA5	163.34^{e}±0.01	13.37^{a}±0.01

Sensory Scores of Soy-Agidi Samples

Table 4 shows sensory scores of the soy-*agidi* fortified with *A. brasiliana* powder, Appearance of the soy-*agidi* samples ranged from 4.40 in sample MSA5 to 7.24 in sample MSA2. Appearance is an important sensory attribute of any food because of its influence on acceptability. Taste scores of the soy-*agidi* samples ranged from 4.80 in sample MSA5 to 7.24 in sample MSA2. Supplementation of *agidi* with soybean resulted to decrease in scores of taste. This is because the panellists were already used to consuming *agidi* without addition of soybean. The values obtained for taste of the soy-*agdi* samples is higher than 2.9 to 5.4 reported for *agidi* produced from pearl-millet and bambara groundnut flour blends (Zakari *et al*., 2011). Texture scores of the soy-*agidi* samples ranged from 4.76 to 6.76. Texture is very vital in a complementary food as it will determine the amount of food an infant would consume since they can only swallow a smooth pudding not a coarse one. The values obtained for texture of the soy-*agdi* samples is higher than 2.8 to 5.9 reported for *agidi* produced from pearl-millet and bambara groundnut flour blends (Zakari *et al*., 2011). Higher values of texture obtained in this study could be as a result of inclusion of *A. brasiliana* powder. The flavour scores of the soy-*agidi* samples ranged from 4.72 to 6.68. Sample MSA2 had the highest value, while MSA5 had the least value. The values obtained in this study is higher than 2.9 to 5.4 reported for *agidi* produced from pearl-millet and bambara groundnut flour blends (Zakari *et al*., 2011), and 3.30 to 3.43% of ash content obtained from *agidi* produced from fermented maize and full fat soy flour (Ikya *et al*., 2013). General acceptability of the soy-*agidi* ranged from 4.44 in sample MSA5 to 7.52 in sample MSA2. Decreased general acceptability of soy-*agdi* could be as a result of lower flavour and taste. This claim is supported by the report of Ojinnaka and Nnorom (2015) who stated that flavour of a food ultimately determines its acceptance or rejection even though its appearance evokes the initial response.

Table 4: Sensory Scores of Soy-*agidi* Samples

Sample	Appearance	Taste	Texture	Flavour	General Acceptability
MSA1	7.24^{a}±1.51	7.24^{a}±1.42	6.76^{a}±1.59	6.52^{a}±1.73	7.52^{a}±1.71
MSA2	6.76^{a}±1.27	6.76^{a} ±0.78	6.24^{a}±1.30	6.68^{a}±1.11	6.88^{a}±1.17
MSA3	6.68^{a}±0.90	6.84^{a}±1.11	6.16^{a}±0.99	6.24^{a}±1.42	6.72^{a}±1.21
MSA4	5.32^{b}±1.03	5.48^{b} ±1.12	5.08^{b}±1.04	5.24^{b}±1.01	5.52^{b} ±1.12
MSA5	4.40^{c}±2.00	4.80^{b}±2.00	4.76^{b}±1.60	4.72^{b}±1.67	4.44^{c}±2.10

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