NUTRITIONAL AND SENSORY, EVALUATION OF BLENDED FLOUR OF WHITE- MAIZE, BENISEED AND DATE- FRUIT FOR PRODUCTION OF CAKE FOR ACTUALISING SUSTAINABLE DEVELOPMENT GOALS.

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Abstract

The study evaluated the sensory and nutritional attributes of blends of white maize and beniseed(Gorigo) flour sweetened with date fruit in cake production. The experimental research design was adopted for the study. Six coded samples of cake produced from wheat, Maize flour, beniseed flour and date fruit: WHS(100%Wheat +Sugar), WHD(100% Wheat +Date), MS(100% Maize+sugar), MD(100% Maize +Date), MBS(50% Maize+50% Beniseed+sugar), MBD(50% Maize+50% Beniseed+Date) were subjected to proximate content determination and sensory evaluation. The data obtained were subjected to descriptive and inferential statistics. The result revealed that there was significant difference (p<0.05) in the colour, aroma, taste, texture and overall acceptability of the products, with the sample WHS being most preferred and the sample MD (being least preferred. Sample MBD was least preferred across all sensory quality and overall acceptability. Result of nutritional composition of samples showed that crude protein, moisture, crude fat, crude fibre and ash increased from 7.31 to 11.70, 9.80 to 12.47, 17.26 to 20.17, 2.03 to 2.35, and 1.05 to 1.84 respectively in the maize-beniseed-date sample. However, carbohydrate content reduced from 60.27 in the wheat-date sample to 51.49 in the maize-beniseed-date sample. WHS was most preferred with mean score of 7.73, while sample MD was least preferred with mean score of 5.40. The study concludes that the maize-beniseed-date sample was least preferred across all sensory qualities, the nutritional composition of sample showed that crude protein, moisture, crude fat, crude fibre and ash increased in the maize-beniseed-date sample. It was therefore recommended that the production of maize-beniseed-date sample should be encouraged for its rich source of nutrients, and dietitians should recommend the maize-beniseed-date cake to patients with gluten sensitivity (Celiac patients) and those with protein-energy malnutrition.

Keywords: Sensory, Chemical Composition, Maize, Beniseed, Date, Cake.

Introduction

Cake is a snack that is usually readily available and enjoyed by children and adults. It is a convenient food product. According to Eke (2008) & (Atef, Mostafa &Samia 2011) Cake is usually served as dessert for meals at ceremonial occasions, like wedding anniversaries, and birthdays. Ingredients usually contain wheat flour, sugar, eggs, butter or oil with some varieties also requiring liquid (such as milk) and leavening agents such as baking powder and flavourings. Generally, wheat flour is commonly used in baking cake and high demand of wheat flour for the production of baked product has led to high cost of purchased. 

Maize or corn (Zea mays) is an important annual cereal crop of the world belonging to family of Poaceae. Maize (Zea mays) is a cereal plant that produces grains that can be cooked, roasted, fried, grind, pounded or crushed to prepare various food items like Pap, Tuwo, Gwate, Donkunu, Aadun, Egbo and many others. All these foods are readily available in various parts of Nigeria among different ethnic groups notably among Yoruba, Hausas, Igbo’s. Apart from food, Maize is also useful for medicinal purpose and as raw materials for some industries(Suresh and Samsher, 2013). Maize lacks amino acids which are lysine and tryptophan which are present in legumes (Janice, Thompson, Linda 2010) therefore, it should not be taking alone. Sesame commonly known as “beniseed” in Nigeria has been regarded as a crop of insignificant importance compared to groundnut, soybean and other legumes. It is widely grown in Northern and Central part of the country as a minor crop, owing to this, there has been little research efforts on the crop. Peters Henry., Mgbang John Edward., Essien N. A & Ikpeme Christine Emmanuel (2016) reported that beniseed has good nutritional value similar to soybean, which is
Beniseed is an oilseed rich in protein, and hence it has potential use in food products as a protein supplement, and there is a need to utilize the defatted sesame meal for edible purposes.

### Beniseed nutrition profile (Sesame indicum) values per 100g.

<table>
<thead>
<tr>
<th>Principle</th>
<th>Nutrient value</th>
<th>Percentage of RDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>573 kcal</td>
<td>29%</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>23.45g</td>
<td>18%</td>
</tr>
<tr>
<td>Protein</td>
<td>17.73g</td>
<td>32%</td>
</tr>
<tr>
<td>Total fat</td>
<td>46.67g</td>
<td>166%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0mg</td>
<td>0%</td>
</tr>
<tr>
<td>Dietary fibre</td>
<td>11.8g</td>
<td>31%</td>
</tr>
</tbody>
</table>

**VITAMINS**

- Folates: 97μg, 25%
- Niacin: 4.515mg, 28%
- Panthothenic acid: 0.050mg, 1%
- Pyridoxine: 0.790mg, 61%
- Riboflavin: 0.247mg, 19%
- Thiamin: 0.791mg, 66%
- Vitamin A: 9 IU, 1%
- Vitamin C: 0, 0%
- Vitamin E: 0.25mg, 2%

**ELECTROLYTE**

- Sodium: 11mg, 1%
- Potassium: 468mg, 10%

**MINERALS**

- Calcium: 975mg, 98%
- Copper: 4.082 mg, 453%
- Iron: 14.55%, 182%
- Magnesium: 351 mg, 88%
- Manganese: 2.460 mg, 107%
- Phosphorus: 629 mg, 90%
- Selenium: 34.4 μg, 62.5%
- Zinc: 7.75 mg, 70%

Source: [www.nutrition-and-you.com](http://www.nutrition-and-you.com)

Date fruits (Phoenix dactylifera) are important commercial crops in the Middle East with a high percentage of carbohydrate, fat; comprising 14 types of fatty acids, 15 salts and minerals, protein with 23 different amino acids, six vitamins and a high percentage of dietary fibre (Walid et al., 2003) & (Food and Agriculture Organization, 2006). Dates is known as “Dabino” in Nigeria and mostly used by the Muslim to break their fast. In Northern Nigeria, Date and pepper are added to traditional beer so as to make it less intoxicating. Dates are one of the best sweet and versatile foods that can regulate the digestive process.

Previous studies (Hanee, 2013) and (Sahiet al., 2003; Sakiyan et al., 2004) described cake ingredients to be flour (which can be from wheat, maize or any other cereal), fat, sweetener e.g., sugar, eggs, baking powders, and flavorings are used for specialty cakes. The quality and quantity of what makes up the cake are important and have influence on the properties of the final product as well as the stability of quality during shelf life. Flour: Flour is the core ingredient in baking as it gives structure by building up frame work (Rabb, 2004).
Statement of the Problem
Beniseed is a highly nutritious but underutilized legume crop in Nigeria; it has been regarded as less significance compared to groundnut, soybean and other legumes in which it has nutritional value of oil (58%), protein (25%), Carbohydrate (13.5%) and ash (5%) similar to soybean which is important for children. Malnutrition has been a major problem affecting most people in the world especially children. Malnutrition during childhood can lead not only to long-term health problems but also to educational challenges and limited work opportunities in future. Most children are malnourished due to poor nutrition and since children enjoys eating snacks and even consumes snacks as part of their major diet therefore, there is need to produce cake such that it meets the nutritional requirements of children by fortifying cakes in other to make it balanced. It has also been identified that there are people who are intolerant to certain protein (gluten) in wheat (Celiac patient). Wheat flour is the most commonly used flour for baked products and pastries, high demand of wheat flour for the production of baked product has led to high cost of purchase because it is not produced locally. Several attempts have been made to produce cake from non-wheat flours. Atef et al., (2011), reported the use of fava beans and cowpea flour in the production of gluten-free cake to combat the prevalence of autism and celiac disease (CD), an intolerance of gluten the active ingredients of cakes which are wheat flour, sugar and fat have been known to be linked to some health-related problems like the celiac disease, diabetes and obesity. Therefore, this study is aimed at evaluating the nutritional qualities of cake produced from blends of white maize and beniseed flour, beniseed (sesum indicum), date fruits and wheat flour to test for sensory parameters: appearance, aroma, texture, taste and overall acceptability on a 9-point hedonic scale. The card used was divided into two sections, A and B.

Design of the Study
The research design adopted for this study is experimental research design. Hassan (2003) defined experimental research design as the disciplined investigation conducted in the context of the development of a product for the purpose of improving on the thing being developed.

Instrumentation
The study used Sensory Evaluation Score Card (SESC) to be filled by participants during the testing session of the cake from blends of white maize, beniseed and date fruit to test for sensory parameters: appearance, aroma, texture, taste and overall acceptability on a 9-point hedonic scale. The card used was divided into two sections, A and B.

Method of Data Analysis: The data collected was subjected to data analysis using descriptive statistics such as mean and standard deviation and inferential statistics.

Materials and Methods
Sources of Raw materials: Maize grain (Zea mays), beniseed (sesum indicum), date fruits and wheat flour and other ingredients like fat, sugar, baking powder, egg were purchased from local market Oja-oba, Ilorin west Local Government Area of Kwara State, Nigeria.

Production Process of products; Processing of Maize Flour
The method of Houssou & Ayemor (2002) was used to prepare the maize flour. The white maize was sorted to remove stones, dirt and other foreign materials. Water was sprinkled on the cleaned maize seeds so as to allow water absorption, toughening the pericarp and germ so they do not splinter during milling. The grains were left for about 10 min before dehulling and milling. The flour was sieved using 250μm mesh size sieve.

Processing of Beniseed Flour
The method of Peters et al., (2016) was used to prepare the beniseed flour. Beniseed grains were washed three (3) times to remove sand and debris and then allowed to drip dry through a mesh. The washed grains were then oven dried at 70°C for 12 hours on aluminum foil and
milled with a milling machine to obtain flour which was subsequently sieved to yield a fine flour texture.

**Processing of date fruit extract**
Date powder was produced using method described by Nnwaneki & Agbuba (2015). the seeds of the fruits were first removed manually using knife and weighing the dried palm fruit. The date palm fruit was washed with water to remove dirt. The de-seeded fruit was then oven dried at 65 ºC for 8 hours and subsequently milled using hand milling machine.

**Production of Cake**
The cake was produced using method described by Sanful et al., (2010) It is explained further by the flowchart below.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flour</td>
<td>250 (g)</td>
</tr>
<tr>
<td>Fat</td>
<td>250 (g)</td>
</tr>
<tr>
<td>Date (powdered)</td>
<td>250 (g)</td>
</tr>
<tr>
<td>Milk (full fat, powdered)</td>
<td>5.0 (g)</td>
</tr>
<tr>
<td>Egg (fresh, whole)</td>
<td>6 eggs</td>
</tr>
<tr>
<td>Vanilla flavor</td>
<td>1 teaspoon</td>
</tr>
</tbody>
</table>


Weigh all ingredients. Creaming of margarine and date powder, add beaten egg, mixed with baking powder and sieve flour. Pour into well-greased baking pan and bake at 120-200C for 15minutes. Remove and place on a cooling rack.

**Method of Data collection**
Proximate analysis of the blend of wheat, maize and beniseed flour, sweetened with date fruit for production of cake.
The proximate composition of the samples was analysed using the standard methods of (Association of Analytical Chemist (OAC, 2000&2005). The samples were analysed for moisture, total ash, crude fibre, crude fat, crude protein and carbohydrate (by differences).

**Sensory Evaluation**
The cakes were allowed to cool on racks for about 30 minutes before evaluation. Cakes were organoleptically estimated for the tested attributes by panellists comprising of both sexes drawn among the students of Home-Economics and Food science, University of Ilorin. Each sample was rated on perceived intensities of standard sensory attributes (acceptability, flavor, texture and colour) using a 9-point hedonic scale, where (9 points) was expressed as liked extremely, (8 points) liked very much, (7 points) liked moderately, (6 points) liked slightly, (5 points) neither liked nor disliked slightly, (4 points) disliked slightly, (3 points) dislike moderately and (1 point) dislike extremely.

**Sample Formulation**
The table revealed the compositional ratio of four possible formulations of Wheat flour supplemented with maize flour and beniseed flour sweetened with date fruit for production of cake. These are WHS(100% Wheat+ Sugar only), WHD(Wheat +Date only), MS C(Maize+ sugar), MD (Maize + Beniseed), MBD (Maize +Beniseed+ Date), MBS (Maize+ beniseed + Sugar). An electrical weighing balance and a blender were used for weighing the flour.
### Table 2: Product formulation

<table>
<thead>
<tr>
<th>Sample</th>
<th>Wheat flour (%)</th>
<th>Maize flour (%)</th>
<th>Beniseed flour (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHS A</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WHD B</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MD C</td>
<td>-</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>MS D</td>
<td>-</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>MB E</td>
<td>-</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>MBS F</td>
<td>-</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

**Keys:**
- **WHD**: 100% wheat + sugar
- **WHS**: 100% wheat + date
- **MD**: 100% Maize + date
- **MS**: 100% Maize + sugar
- **MBD**: 50% Maize; 50% Beniseed + date
- **MBS**: 50% Maize; 50% Beniseed + sugar

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**PLATE 1: RAW MATERIALS USED**

- **WHEAT GRAIN**
- **WHITE MAIZE**
- **BENISEED**
- **DATE FRUIT**

- **WHEAT FLOUR**
- **MAIZE FLOUR**
- **BENISEED FLOUR**
- **DATE POWDER**
Method of Data Analysis: The judges evaluated the samples using a 9-point hedonic scale. The data collected was subjected to analysis using descriptive statistics such as mean and standard deviation and inferential statistics. One-way analysis of variance (ANOVA) was used to test for significant differences in the acceptability of cakes produced. Hypotheses using Analysis of variance (ANOVA) and independent t-test. All hypotheses were tested at 0.05 level of significance.
Results and Discussion

Table 1: Interpretation of demographic data of the respondent

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>percentage%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>14</td>
<td>46.7</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
<td>53.3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-20</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>21-25</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>26-30</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>TOTAL</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>200</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>300</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>400</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td>500</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>TOTAL</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Research work (2019).

Table (1) shows that 14(46.7) males and 16(53.3) female participated in the sensory evaluation session of the research. 9 respondents representing 30% were aged (16-20), 18 respondent which represents 60% were age (21-25) and 3 representing 10% were age (26-30). The table further show that 4 (13.3%) respondents represent 100 & 200 levels respectively. 6 (20%) represents 300level and 400level at same time, while 10(33.3%) were 500level of Home economics and Food science, University of Ilorin.

Research Question 1: What is the nutritional and sensory quality of cake produced from wheat and cake produced from blended flour of white maize and beniseed.

Table 2: Nutritional composition of cake produced from wheat flour and cake produced from white maize and bennised sweetened with date.

<table>
<thead>
<tr>
<th>Samples</th>
<th>Crude protein</th>
<th>Moisture</th>
<th>Crude fat</th>
<th>Crude fibre</th>
<th>Ash</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHS A</td>
<td>8.81±0.04</td>
<td>10.22±0.01</td>
<td>19.13±0.02</td>
<td>2.03±0.05</td>
<td>1.05±0.04</td>
<td>58.78±0.06</td>
</tr>
<tr>
<td>WHD B</td>
<td>9.26±0.01</td>
<td>9.80±0.00</td>
<td>17.26±0.04</td>
<td>2.09±0.02</td>
<td>1.34±0.02</td>
<td>60.27±0.00</td>
</tr>
<tr>
<td>MS C</td>
<td>8.63±0.03</td>
<td>12.34±0.00</td>
<td>18.48±0.21</td>
<td>2.11±0.02</td>
<td>1.64±0.01</td>
<td>58.82±0.50</td>
</tr>
<tr>
<td>MD D</td>
<td>7.31±0.31</td>
<td>12.47±0.04</td>
<td>18.69±0.50</td>
<td>2.15±0.03</td>
<td>1.26±0.04</td>
<td>58.16±0.50</td>
</tr>
<tr>
<td>MBD E</td>
<td>11.70±0.21</td>
<td>12.47±0.21</td>
<td>20.17±0.50</td>
<td>2.35±0.03</td>
<td>1.84±0.03</td>
<td>51.49±0.28</td>
</tr>
<tr>
<td>MBS F</td>
<td>10.75±0.03</td>
<td>12.61±0.42</td>
<td>22.18±0.21</td>
<td>2.27±0.02</td>
<td>2.24±0.01</td>
<td>49.98±0.35</td>
</tr>
</tbody>
</table>

Values are Means ± S.D. Means in the same column having different superscript are significantly (< 0.05) Different.

KEY:
WHS: 100% wheat + sugar
WHD: 100% wheat + date
MD: 100% Maize + date
MS: 100% Maize + sugar
MBD: 50%Mai;e; 50%beniseed + date
MBS: 50% Maize; 50% beniseed + sugar
Table 3: Sensory qualities of cakes produce from blends of white maize and beniseed flour sweetened with date fruit.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Colour</th>
<th>Aroma</th>
<th>Taste</th>
<th>Texture</th>
<th>Overall acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHS</td>
<td>A</td>
<td>7.30±1.12</td>
<td>7.20±1.0</td>
<td>7.67±1.27</td>
<td>7.37±1.07</td>
</tr>
<tr>
<td>WHD</td>
<td>B</td>
<td>6.37bc±1.52</td>
<td>6.70ab±1.32</td>
<td>7.00ab±1.51</td>
<td>6.50bc±1.57</td>
</tr>
<tr>
<td>MD</td>
<td>C</td>
<td>5.63a±1.61</td>
<td>5.47d±1.55</td>
<td>4.97d±1.77</td>
<td>5.00d±1.60</td>
</tr>
<tr>
<td>MS</td>
<td>D</td>
<td>7.30a±1.18</td>
<td>6.33bc±1.45</td>
<td>6.57bc±1.48</td>
<td>6.03bc±1.33</td>
</tr>
<tr>
<td>MBD</td>
<td>E</td>
<td>5.70c±1.58</td>
<td>5.87cd±1.74</td>
<td>5.60cd±1.52</td>
<td>5.30cd±1.44</td>
</tr>
<tr>
<td>MBS</td>
<td>F</td>
<td>6.47b±1.22</td>
<td>6.20bcd±1.32</td>
<td>6.30bc±1.37</td>
<td>5.53cd±1.85</td>
</tr>
</tbody>
</table>

Values are Means ± S.D. Means in the same column having different superscript are significantly (<0.05) different.

KEY:
- WHS: 100% wheat + sugar
- WHD: 100% wheat + date
- MD: 100% Maize + date
- MS: 100% Maize + sugar
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- MBS: 50% Maize; 50% beniseed + sugar

What is the level of acceptability of cake produced from wheat only and cake from white maize with beniseed flour sweetened with date fruit.

Figure 1: Level of general acceptability of cake produced from wheat flour and cakes made from blends of white maize and beniseed flour.

KEY:
- WHS: 100% wheat + sugar
- WHD: 100% wheat + date
- MD: 100% Maize + date
- MS: 100% Maize + sugar
- MBD: 50% Maize; 50% beniseed + date
The result of level of acceptability reveals that sample WHD= Wheat & date only has mean rating of \( \bar{x} = 5.4 \pm (1.45) \). The sample WHS=Wheat & sugar only was most preferred with mean score \( \bar{x} = 6.77 \) while sample MD= Maize & date was least preferred with mean score \( \bar{x} = 5.32 \). Approximately 25% of judges accepted each of the samples.

**Hypothesis One:** There is no significant difference with respect to the acceptability of wheat flour cake and the white maize flour cake enriched with beniseed.

**Table 5:** ANOVA on overall acceptability of cake produce from wheat only and cakes blends of white maize and beniseed flour.

<table>
<thead>
<tr>
<th>Sum of squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>101.894</td>
<td>5</td>
<td>20.379</td>
<td>10.103</td>
</tr>
<tr>
<td>Within Groups</td>
<td>350.969</td>
<td>174</td>
<td>2.017</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>452.861</td>
<td>179</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( \alpha = 0.05 \)

Table 5: shows an F-value of 10.13 and p-value of .000 since the p-value is less than the alpha level \( (p< 0.05) \) the null hypothesis which states that ‘There is no significant difference in the sensory qualities of cake produce from wheat only and cakes blends of white maize and Beniseed flour, was rejected.

**Discussion of Result**

**Research question 1:** Showed the nutritional composition that Sample MBD= Maize, beniseed and date fruit has the highest crude protein content (11.70%) closest to this value of MBS= Maize, Beniseed& sugar (10.75%) While sample MD=Maize & Date fruit has the lowest crude protein content of (7.31%). This is in agreement with Ayinde et al., (2012). Who was able to find out in their research that the crude protein increased with increase in the proportion of the DBF (defatted beniseed flour) levels in the “Kokoro” Samples to be 5.32 and 6.74 respectively. High protein contents are expected in samples with beniseed since it is rich in protein.

Sample MBS=Maize, beniseed & sugar has the highest moisture content (12.61%) while sample WHD=Wheat & date only has the least moisture content (9.80%). This disagrees with Oyeyinka et al., (2014). Find out in their study that the cake produced from 100%wheat sweetened with date has the highest moisture content (22.37%).

Sample MBS= Maize, beniseed & date fruit has the highest fat contents (22.18%) with MBS having a close value of (20.17%) and the sample with the least fat content was WHD= Wheat & date only which has value (17.26%). This is in accordance with research carried out by Olumakaiye et al. (2012). In which cookies made from the composite flour (plain flour & beniseed had higher crude fat contents than samples made from 100% plain flour. Fat content increased as the level of beniseed substitution increased. The study also agrees with (Tunde- Akintunde et al., 2012) who stated that because of the excellent quality of the edible oil it produces 50.0; sesame is often called queen of the oil seed crops.

Sample MBD= Maize, beniseed & date fruit has the highest crude fibre contents to be (2.35%) While sample WHS=Wheat & sugar was least with 2.03%. This does not agree with Oyeyinka et al.,(2014) who reported in their study that all cakes produced were not significantly different \( (p<0.05) \) except for cake from wheat sweetened with sugar (0.89%), in which this study the cake produce from wheat and sweetened with sugar has the highest fibre content. This disagrees with Ayinde et al., (2012).That LMA (60:40) had the least value of crude fibre 1.09% and AZO (100%maize) had the highest crude fibre content and there was decrease in crude fibre obtained with increase in the proportion of DBF (defatted beniseed flour).
Sample $MBD =$ Maize, beniseed & date fruit has the highest total ash contents (2.24%), and sample with the least total ash contents has value (1.03%) is Sample $WHS =$ Wheat & sugar only. This disagrees with Oyeyinka et al., (2014). Who reported that Cake produced from 100% wheat flour sweetened with sugar had the highest ash content while cake from composite flour sweetened with sugar had the lowest. Ash content of all the cakes sweetened with sugar was higher than cake sweetened with date fruit extract except for cakes produced from 100% cowpea flour. Ash content has to do with mineral in a food product.

Sample $WHD =$ Wheat & date only has the highest carbohydrate contents of (60.27%) While sample $MBS =$ Maize, beniseed & date fruit has the lowest carbohydrate content (49.98%). This in accordance with Olumakaiyete al(2012) who reported that the control had the highest carbohydrate content (65.86%) while cookies with composite had the least value of carbohydrate. The result of proximate of this study also shows that the carbohydrate level of maize decreases with addition of beniseed flour. This is due to high content of protein in beniseed.

Research question two revealed that for colour, the sample $WHS =$ Wheat & Sugar only, $MS =$ Maize & sugar only was the most preferred with mean score ($\bar{X} =$7.30± (1.12) and mean score ($\bar{X} =$7.30± (1.18), respectively. While sample $MD =$ Maize & date only was the one preferred with mean score ($\bar{X} =$5.63± (1.61). Low sensory evaluation for other cakes base on colour was concluded to be due to the presence of date which is brownish and also beniseed which is roasted to reduce fat.

For aroma, the sample $WHS =$ Wheat & sugar only was the most preferred with mean score ($\bar{X} =$7.20± (1.0) with $WHD =$ Wheat & date having a close value of while the sample $MD =$ Maize & date was the one preferred least with mean score ( $\bar{X} =$6.70) while the sample $MD =$ Maize & date was the one preferred least with mean score ($\bar{X} =$5.47± (1.55). This is in accordance with Oyeyinka et al(2014). Who in their studies discovered that cake produced from wheat and sugar had the highest preference base on aroma while cake from composite flour had the least preference.

For taste, the sample $WHS =$ Wheat & sugar only was the most preferred with mean score ($\bar{X} =$7.67± (1.27), while sample $MD =$ Maize & date was least preferred with mean score ($\bar{X} =$4.97±(1.77). The result of sensory evaluation base on taste can be attribute to study carried out on cookies using plain flour and benised by Olumakaiyete al(2012). Where the taste of the cookies tends to decrease with increase in addition of benised this could be firstly due to the bitter taste of some compounds in benised flour particularly at high temperature.

Texture, the sample $WHS =$ Wheat & sugar only was the most preferred with mean score ($\bar{X} =$7.37± (1.07) while sample $MD =$ Maize & date was least preferred with mean score ($\bar{X} =$5.00± (1.60). It is observed that Sample MD has does not have fine texture this may be attributed to high fibre contents in maize and date fruit.

Result of research question three on level of acceptability cake produced from wheat flour only and cake from white maize with benised flour, using the mean value of the general acceptability of cake produced from wheat flour only and cake produce from white maize flour with benised sweetened with date revealed that sample $WHD =$ Wheat & date only has the mean rating of = $\bar{X} =$ 7.0) which is closer to the value of cake produced with wheat and sugar only.

Overall acceptability, the sample $WHS =$ Wheat & sugar only was the most preferred with mean score ($\bar{X} =$7.73± (1.11) while sample $MD =$ Maize & date was least preferred with mean score ($\bar{X} =$5.40± (1.45). This in accordance with Olumakaiyete al,(2012). Sensory evaluation scores of the cake decreased with increasing level of benised flour in the cake, though at 10% substitution the product was still acceptable probably because the Organoleptic qualities was similar to the conventional cake (control sample). Due to the same level of substitution of maize with benised (50% maize; 50% benised) causes decrease in sensory attributes in terms of colour, taste in which benised contributed nutty taste to the cake which contributed to low acceptability of fortified maize flour.

Overall acceptability cake produced from wheat flour only and cake produce from white maize flour with benised flour using the $\bar{X} =$7.73 ($\bar{X} =$5.40). Where the cake produced from wheat flour only and cake produce from white maize flour with benised sweetened with date revealed that sample $WHD =$ Wheat & date only has the mean rating of = $\bar{X} =$ 7.0) which is closer to the value of cake produced with wheat and sugar only.
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The texture of cakes produced. WHS- Wheat & Date only having being the most accepted. This may be due to the fact that making cake from maize, beniseed and date is a new product and people are already use to cakes produced from wheat and sugar and maize has a finer texture in terms of mouth feel, but it is not as if the new product was totally rejected. Result of hypothesis two revealed that there is no significance (P>0.05) difference in the overall acceptability of cakes made from wheat flour only and cakes made from white maize fortified with beniseed.

**Conclusion**

Considering all the analysis carried out, the study concludes that using maize flour and beniseed and substituting sugar with date fruit to produce cake is acceptable. It was observed that production of cake from maize flour fortified with beniseed improved the protein content of the product. As samples fortified with beniseed (MBD and MBS) has the highest value in terms of crude protein contents and Ash contents which is rich in minerals. The production should be encouraged as it allows for children and older individuals to eat balanced pastries to curb malnutrition, management of diet related disease and to make use of our resources available around us to sustain the economic. Therefore, reduce the overall dependent on wheat flour. However, it is advised if the cake can be in syrup or any other modified form because the maize becomes hard after getting cold and also the powdered date add to its hardness.

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