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PRODUCTION AND PROXIMATE ANALYSES OF SNACKS (CHIN-CHIN AND MEAT PIE) USING SOYBEAN AND MUSTARD SEEDS

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Abstract

This study determined the production and proximate analysis of snacks (chin-chin and meat pie) using soybean and mustard seeds. Four (4) samples were prepared using (20: 80) and (50:50) of mustard seed and soybean to produce chin-chin and meat pie. The snack was processed from soybean and mustard seeds and the proximate composition as well as the sensory qualities of the samples of chin-chin and meat pie was examined. Specifically, crude protein, crude fat, crude fibre, moisture, ash, and carbohydrate contents of the composition were analyzed. Results revealed that chin-chin using (20:80) and (40:60) had highest level of moisture content (37.63-0.58), meat pie (20:80) and (40:60) with highest level (19.9-0.088), chin-chin had highest crude fibre (CF) using (20:80 & 40:60) level (0.99-0.015), high in ash content (AC) level (2.50-0.039) in both chin-chin and meat pie, in crude fat, meat pie (20:80) and (40:60) had highest level of (6.63-0.029) and carbohydrate content in meat pie of (20:80) is high of (69.53) with highest level of chin-chin (40:60) had (0.60). The sensory evaluation of chin-chin and meat pie produced using (20:80) and (40:60), chin-chin (40:60) had (65%) with meat pie (40:60) had (55%) accepted by a panelist with their highest values. It is recommended that effort to promote snack using soybean and mustard seeds should focus on nutritional composition as a unique selling point rather than the sensory qualities.

Keywords: Production, proximate, snacks, soybean, mustard seeds, meat pie, chin-chin

Introduction

Corn paste (ogi) is a fermented cereal pudding from Nigeria, typically made from maize, sorghum, or millet. Traditionally, the grains are soaked in water for up to three (3) days, before wet milling and sieving to remove husks. The filtered cereal is then allowed to ferment for up to three (3) days until sour asserted by Sokari, Karibo & Manuel (2005). Ogi is household meal mainly for breakfast but few people take it anytime for the day. It is also one of the recommended meals that growing children graduate to from breast milk. Akamu is a nutritious meal which is a good source of carbohydrate, B-vitamins (pantothenic acid –B₅, niacin B₃, riboflavin and thiamine –B₁), folic acid, vitamins A and C, potassium, chromium, selenium, zinc, phosphorous, magnesium and many other. Ogi assists nursing mothers to increase the flow of their breast milk, that is why it is mainly recommended meal for nursing mothers and it can be enjoyed alone or eaten with other foods like bean cake (akara), bean pudding (moimoi) and bean porridge.

Millet are a group of highly variable small seeded grasses, widely grown around the world as cereal crops of grains for fodder and human food illustrated by McDonough, Cassandra and Ronney, Lloyd, Saldivar, Sergio; (2000). Millet is considered as “nutria cereal” because it is highly in fiber, protein and rich in B-vitamins, (especially niacin, B6 and folic acid), phosphorus, manganese (a trace mineral that acts as an antioxidant) and may benefit people suffering with arthritis, inflammation, and poor bone

health spined by Zhang, Zhou & Zhang (2009) . Magnesium is a mineral that has been shown to help relax muscle and nerves to reduce the severity of muscle asthma and migraine attacks, build and strengthen bones as well as lower blood pressure and reduce the risk of heart attacks, also helps in controlling diabetes, lower levels of triglycerides, increase the favorably, HDL levels and zinc associated by Kumar, Ashwani, Timer, Tomer, Vidisha, Kaur, Amarjeet, Vikas, Gupta and Kritika; (2018).

Sorghum is a genus of flowering plants in the grass family poaceae, it's an important crop worldwide used for food (as grain and in sorghum syrup or sorghum molasses), animal fodder, the production of alcoholic beverages and bio-fuels illustrated by Mutegi, Evans, Sagnard, Fabrice, Muraya, and Moses; (2010). It contains more antioxidants than blueberries, high protein and fiber and no gluten which makes it a perfect dietary grain for those with celiac diseases.

A soy bean is a species of legume and its edible bean which has numerous uses. It is useful for soy milk; it is significant and cheap source of protein for animal feeds and many packaged meals which contain significant amount of phytic acid, dietary minerals and B vitamins. Soy beans are an exceptional source of essential nutrients. Providing 100gram serving high content of the daily value (DV) especially for protein (36% DV), fiber dietary, iron manganese (120%) phosphorus (101%) and several B vitamins including folate (94%) high content also exist for vitamin K, magnesium, Zinc and potassium asserted by Blackman, Obendorf & Leopold (2001).

Watermelon is a plant species in the family cucurbitaceae, it is just water and sugar, and it is actually a nutrient dense food. It provides high levels of vitamins, minerals and antioxidants and just a small number of calories, watermelon contains thiamin, riboflavin, niacin, vitamin B-6, folate, pantothenic acid, magnesium, phosphorus, potassium, zinc watermelon associated benefits in promoting a healthy complexion and hair increased energy and overall lower weight illustrated by Fila, Itam & Johnson (2013). Corn paste (wet ogi) is now being processed using both modern and traditional methods. The traditional method is a batch process carried out on a small scale for domestic use or as a commercial venture by some housewives, also in order to enhance the nutritional benefits of corn paste (wet ogi) with addition of soybean, sorghum and watermelon seeds for optimum benefits add more nutrient like protein, fiber, dietary mineral, Vitamin-B and many more asserted by Vila-Real, Pimenta-Martins, Maina, Gomes & Pinto (2017).

Materials and methods

The experiment was carried out at Oyo State College of Agriculture and Technology, Home and Rural Economics Department in Food Laboratory. Sorghum (*sorghum vulgare*), millet (*pennisetum glaucum*) soybean (*glycine mat*) and watermelon seed were all purchased in towobowo market in igbo-ora, Oyo State.

Material used in the preparation of corn paste (wet ogi) using 50:20:20:10%

Recipe	Quantity used
Watermelon seeds	500g (50%)
Sorghum	200g (20%)
Millet	200g (20%)
Soybean	100g (10%)

Method used in the preparation of corn paste (wet ogi) enriched with water melon seeds

*Cereal grains (maize, millet, and sorghum) were sorted with watermelon seeds and soybeans

*The mixture were soaked in water for three (3) days

*After which each mixture was wet milled, sieved using muslin cloth

*The sieved starch was allowed to sediment.

*Subjected to sensory evaluation and the remains were taken for laboratory test to know the nutritional contents.

Sensory Evaluation

The slurry was allowed to cool to about 45⁰C. Gruel of corn paste (wet ogi) sample were evaluated for organoleptic characteristics with the use of twenty(20) taste panelist using teaching and non-teaching staff of Home And Rural Economics, Oyo State College of Agriculture and Technology Igboora Oyo State, Nigeria.

Sensory attributes of corn paste using sorghum, millet and soybean enriched with watermelon seeds.

Parameters	Score	Colour	Taste	Flavour	Appearance	Overall acceptability
Like extremely	9	6(30.0)	4(20.0)	8(40.0)	5(25.0)	9(45.0)
Like very much	8	6(30.0)	6(30.0)	4(20.0)	7(35.0)	7(35.0)
Like moderately	7	5(25.0)	8(40.0)	8(40.0)	5(25.0)	4(20.0)

Like slightly	6	3(15.0)	2(10.0)	00	3(15.0)	00
Neither like nor dislike	5	00	00	00	00	00
Dislike slightly	4	00	00	00	00	00
Dislike moderately	3	00	00	00	00	00
Dislike very much	2	00	00	00	00	00
Dislike extremely	1	00	00	00	00	00
Total		20(100.0)	20(100.0)	20(100.0)	20(100.0)	20(100.0)

Source: Field survey, 2019

Colour: The data obtained on the colour of corn paste produced in this study showed ranged from 15.0 to 30.0. Higher scores of the colour is 30.0 in percentage with 9 and 8 in frequency which means the corn paste (wet ogi) enriched with water melon seeds fortification were more acceptable by the consumer.

Taste: The taste scores of corn paste with water melon enrichment ranged from 10.0 to 40.0. The highest scores of 40.0 with 8 in frequency were obtained. The implication of this finding is that corn paste (wet ogi) using sorghum, millet and soybeans enriched with water melon seeds had higher taste preference than any other ogi produced.

Flavour: The data obtained on the flavor of corn paste produced in this study had 40.0 in percentage with 8 in frequency with different in parameters (like extremely and like moderately) which means the corn paste with water melon seed enrichment had higher flavor value accepted by consumers.

Appearance: The data obtained on the of corn paste (wet ogi) in this study showed that appearance might not significant influence the choice of panelists for the production of corn paste with watermelon seeds, sorghum and soybean.

Overall acceptability: Like colour, taste, flavor, and appearance of the corn paste (wet ogi) with water melon seeds enrichment, the overall acceptability of corn paste had the highest overall acceptability score (45.0). The insignificance of the difference in overall acceptability of corn paste with water melon seeds enrichment as well as minimum overall acceptability score using a 9-point hedonic (likeness)

scale which indicates the sensory attributes of corn paste(wet ogi) are generally acceptable to the consumer.

The result obtained on the proximate composition of corn paste (wet ogi) using sorghum, millet and soybeans enriched with water melon seeds

Nutrient	Quantity(Mg/100g)
Crude protein (CP)	6.2
Crude fat (CFAT)	1.08
Crude fibre (CFIBRE)	2.59
Ash (A)	0.33
Moisture content (M)	69.30
Dry matter (DM)	42.32
Carbohydrate (NFE)	34.49

Source: Omotoso, S.M, (2019)

Crude protein: Corn paste (wet ogi) with water melon seed enrichment had 6.2% in which its very beneficial to humans. They are one of the building blocks of body tissue. The paste (ogi) are rich in protein, which is essential constituents of living cells.

Crude fat: The corn paste (wet ogi) produced from sorghum, millet and soybean with water melon seed enrichment had low fat content with amount of 1.06% which indicates that the content of water melon seed present boosts the fat contents.

Crude fibre: Lower amount of crude fibre where obtained (2.59%).These lower value of crude fibre are not likely to have positive effect in the gastro intestine organ of man.

Ash: Ash is the inorganic residue remaining after water and organic matter have been removed by heating in the presence of oxidizing agents, which provides a measure of the total amount of minerals within a food. However lower amounts of ash were obtained in corn paste produced (0.33%). The ash content is indicative of the mineral composition. Therefore, the corn paste with water melon seed enrichment has lower ash value are likely to have lower amount of food minerals.

Moisture content: The corn paste produced using sorghum, millet and soybean enriched with water melon seeds had high moisture content of 69.30% and could likely lead to faster deterioration of corn



paste (wet ogi). Bolade; Anota & Bolade (2007) reported that foods containing moisture content more than 9% tend to undergo microbial degradation upon long term storage.

Dry matter: The dry matter or dry weight is a measurement of the mass of food when completely dried and this includes carbohydrate, fats, proteins, vitamins, minerals and antioxidants (e.g thiocyanate, anthocyanin and quercetin. Carbohydrate, fats and proteins which provide the energy in foods (measured in kilocalories or kilojoules), which make up ninety percent(90%)of the dry weight of a diet. The dry matter value in the product is 42.32% this is very high in the product (ogi). Dry matter consists of antioxidants and minerals. The carbohydrate content in sample produced is 34.49%

Conclusion

From the research findings, it is concluded that soybean, watermelon seed and sorghum or millet in corn paste (wet ogi) significantly improved the crude protein content, mineral composition and enhanced some desirably functional attribute. Addition of soybean and watermelon seed protein concentrate up to 10% is generally accepted in all the sensory properties evaluated. Also soybean and watermelon seed protein concentrate may find the use in carbohydrate dense foods to alleviate the problem of protein deficiency especially in the developing nations.

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