



DEVELOPMENT OF MASALA COOKIES USING SWEET POTATO POWDER

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INTRODUCTION

INTRODUCTION :

Cookies have been defined as snacks that are produced from unpalatable dough which when baked in an oven is transformed into an appetizing product.cookies have been reported to be one of the most consumed confectionery products in the world. Because cookies are ready to eat form and composite flours may have better application in cookies than in other baked products. In order to improve the nutritive value ,cookies are prepared with either fortified or composite flour. Various researches have reported that cookies with acceptable quality can be produced from flour blends of sweet potatoes. Sweet Potato being a root crop is relatively low in protein content. Sweet Potatoes may have high nutrients , which are carbohydrates and fibers . Sweet Potato is an important alternative source of carbohydrates and attains fourth place after nice , corn and cassava.sweet potato

powder can serve as a source of energy and carbohydrates (pro -vitamin A), minerals (calcium, potassium,iron) and dietary fibers which can be add natural sweetness ,colors and flavors to processed food products.

VITAMINS AND MINERALS :

Sweet potato helps to keep eyes healthy as well as the immune system, body's defense against germs. It's also good for reproductive system and organs like heart and kidneys. Sweet potatoes contain B vitamins ,Vitamin C ,Calcium ,Iron ,Magnesium ,Phosphorus ,Potassium ,Thiamin ,Zinc .Natural compounds called carotenoids give sweet potatoes their rich color. Carotenoids are also antioxidants, which means they have the power to protect cells from day-to-day damage. Sweet potato flour can be used as a source of energy and nutrients and can be added to formulations to replace wheat flour. It is also used for imparting desired properties , Nutritional value,Antioxidants and Natural color to processed foods and also used as thickeners and gelling agents .They are currently numerous items in the baking industry such as sugar free,low calorie,zero cholesterol and high in Fiber and protein that health conscious .Also a range of artificial sweeteners that are non-toxic,non-caloric and sweeter than sucrose used in food processing instead of sugar. Sweet potato powder has become a key solution for the production of new products in the current global habitation. It has a high energy ,low protein and has been exported to be of good biological value .It has been found to contain a high source of beta carotene imperative content of nutrient that found in SPF plays a pivotal role in sustaining main food products development and also can make it to be used as a ingredient in the numerous food formulation. Therefore it can partially replace wheat flour in baked goods and can be effectively utilized if its functional properties are properly identified.

GINGER AND GARLIC POWDER:

Garlic And ginger are known to be beneficial in flatulence,constipation, faulty digestion, inadequate food intake,chronic coughs, leprosy and in many other diseases. Garlic is a rich source of

several phytonutrients and is used in the treatment and prevention of a number of diseases including atherosclerosis, high blood pressure, flu, coronary heart disease etc. Its Therapeutic actions are related to various sulfur compounds responsible for its pungent smell . It is considered as an effective antioxidant and can boost the body's immune system and even prevent cancer such as colon cancer . The powdered rhizome of ginger has long been used in traditional medicine for alleviating the symptoms of gastrointestinal infections.Ernst and Pittler reviewed the evidence for the usefulness of ginger against nausea and vomiting from six clinical studies. The use of garlic in bread and found that bread with garlic flavor and without any deleterious effect on its quality could be made with 2 percent addition of garlic extract. These days consumers have been looking for food ingredients that are more natural and healthy. Keeping this in view, a study was planned to incorporate garlic powder and ginger powder in sweet potato powder to make cookies.

CURRY LEAF POWDER :

The Indian subcontinent has been blessed with an array of medicinal plants, with promising nutritive value.Murraya koenigii Spreng belonging to family Rutaceae and commonly known as “curry leaves”has been “The Ultimate Cure” .The fresh leaves are reported to have a high nutritional value and are extremely rich in antioxidant vitamins, minerals, carbazole , alkaloids, polyphenols, tannins and saponins . These leaves find ample use in the south Indian recipes but their role in north Indian kitchens is so much fringed that it is just used as merely a flavoring agent, and usually discarded before eating, leaving all of the nutrition in it unutilized. Promotion of curry leaves in a form exhibiting maximum consumption is the need of the hour.

Dried powder form provides a dual benefit of ease of use and longer keeping quality of the products.

MINT FLOUR :

Mint or mentha belongs to the *Lamiaceae* family, which contains around 15–20 plant species, including peppermint and spearmint. It is a popular herb that people can use fresh or dried in many dishes and infusions. Manufacturers of toothpaste, gum, candy, and beauty products often use mint oil. Using fresh mint and other herbs and spices in cooking can help a person add flavor while reducing their sodium and sugar intake.

Throughout history, people have used different species of mint plants in medicine. Different types of mint plants offer a range of antioxidant qualities and potential health benefits, especially for people who have irritable bowel syndrome.

CHILLI FLAKES :

Chilli flakes, sometimes known as "crushed red pepper flakes," are used as a garnish on a variety of foods, including pizza, stir-fries, hot spaghetti, and many more. To add heat, you may whisk them into sauces.

OBJECTIVES :

- To develop a new food item.
- To develop cookies enriched with sweet potato powder .
- To develop a soft texture sweet potato cookies.
- It Is attractive and delicious to all aged people.
- To utilize and properly use sweet potato cookies in our local market.
- To gain natural sweetness from the sweet potato .

REVIEW OF LITERATURE :

A. Effect of sweet potato flour on quality of cookies :

In addition to other physical and sensory characteristics, color changes were examined in sweet potato flour, composite flours, and cookies. In conventional cookie recipes, plain wheat flour was added in quantities of 5, 10, 15, 20, and 25% to sweet potato flour. The breadth of the cookies fell from 282.00 to 264.00 mm among treatments when sweet potato flour was added, and the thickness likewise decreased from 68.90 to 65.00 mm. In the end, as the amount of sweet potato flour increased, the value of the spread factor similarly decreased, going from 41.47 to 40.00. There was no discernible variation in the physical characteristics of the cookies.(S.Sareed et.al)2012.

B. Development of cookies enriched with mint powder:

The cookies are cooked until they are crisp or just long enough to be soft, although some varieties are never baked. There are many different ways to make cookies, and there are many different components, such as sugars, spices, almonds, dried fruits, butter, peanut butter, or chocolate. The cookie's tenderness could vary depending on the baking time. The cookies were made, and an enhanced mint was developed. powder. After that, the prepared cookies were examined for the different sensory quality characteristics. such as hue, flavor, texture, appearance, taste, and panelists' general acceptance after semi-training on a 9-point Likert scale (1 being very disliked and 9 being extremely liked) by 10 assessors in in compliance with Am trine et al.'s recommended procedures (1965).Following that, the scores were statistically examined using Panes and Sukhumi's (1985) guidelines. This processing was carried out at the Ispahani Foods Limited Group's factory in Gazipur. Bangladesh The research has been completed. June through December 2019; an overarching theory of cookies might be made in this manner. Though it originated from cakes and other sugared Breads, the cookie in nearly every form, has given up on using water as a cohesive agent. Cake "batter" (the base, also referred to as "water") is made as thin as conceivable, enabling better formation of the bubbles that give a cake its fluff. Within the Cookie, the cohesive agent, has evolved into a kind of oil.(Arafat Hossain et.al).

C.Quality characteristics and sensory evaluation of cookies produced from the composite blends of sweet potato

Cookies are a staple of snack meals since they come in a range of flavors and are easily digested and crisp. Composite flours are much more desirable because they are higher in nutrients and may be used to make healthier cookies A study was conducted to create cookies using wheat (*Triticum aestivum* L.) and sweet potato (*Ipomoea batatas* L.) flour and to assess the product's quality attributes. The mature Wariapola Red sweet potatoes were purchased from commercial producers. After being cleaned, peeled, and sliced into thin, one-millimeter slices, the tubers were sun-dried until they became extremely brittle. After being dried, the chips were ground, sieved through a 250 µm screen, and sealed in airtight receptacles. Sweet potato flour's nutritional study revealed that its contents include 85.5% soluble carbs, 9.4% dietary fibers and 2.3% protein. As the amount of sweet potato flour increased, the cookies' physical attributes—such as thickness, volume, and spreading factor—decreased from 0.969 to 0.910 cm, 41.66 to 30.41 cm³, and 6.43 to 5.61, respectively. With the increase in sweet potato flour from 0 to 100% of the composite flour for cookies, the moisture, ash, fiber, and soluble carbohydrate content increased significantly ($p < 0.05$) from 1.33 to 1.37%, 2.07 to 2.4%, 2.14 to 8.7, and 80.86 to 85.97%, respectively. In contrast, the protein content decreased significantly ($p < 0.05$) from 7.04 to 6.22. In comparison to other treatments, the sensory analysis revealed that the cookies enhanced with 40% sweet potato flour were well accepted in terms of color, texture, flavor, and overall acceptability. Within the generally recognized guidelines, the blend of 40% sweet potato flour and 60% wheat flour was effective in creating composite cookies with superior nutritional and organoleptic properties. The results of this study provide important information for the creation of delicious, low-gluten, high-fiber cookies.(Fathima jemziya et.al 2015).

D.Functional properties of sweet potato flour and its role in product development :

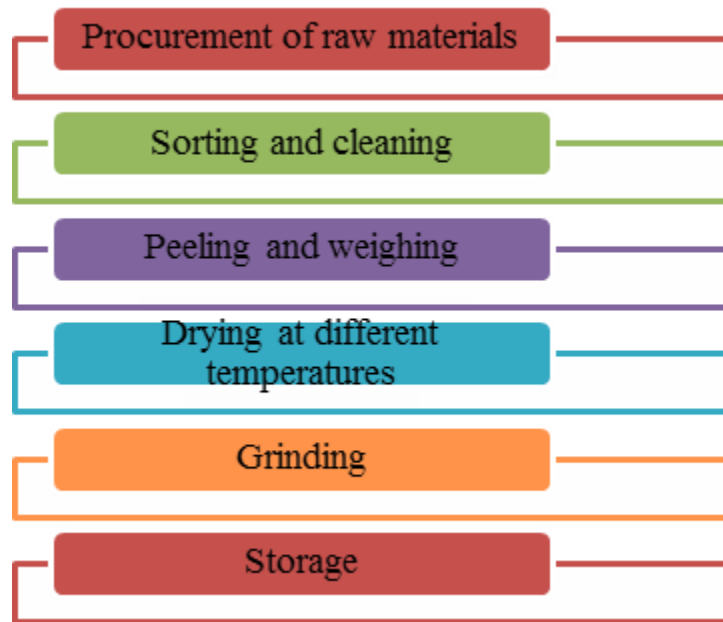
The author reviewed that the Sweet potato flour is widely available, naturally colored, high in energy, low in protein, and has good biological activity in the human diet, it is very feasible to produce food products from it worldwide. Because of this, it has become a key ingredient in the creation of new products in the modern world. Sweet potato flours can be used as thickeners and gelling agents as well as to provide processed meals the necessary qualities, nutritional content, antioxidants, and natural color. Unfortunately, there is a dearth of knowledge about the sweet potato flour's useful qualities, which severely restricts its use. This review aims to provide information on the useful qualities of sweet potato flour, emphasizing its special qualities and possible range of uses. There was a noticeable difference in the functioning attributes. Functional characteristics showed a notable variance depending on the type and specific processing techniques. Functional properties like viscosity, pasting temperature, gelatinization temperature, swelling power, and solubility were also impacted by variations in granule size and starch, protein, and amylose concentrations. Because of their high bulk density, the modified flours made by steaming and blanching are used in the pharmaceutical business as a medication disintegrant and binder, as well as in food preparations to minimize paste thickness in food products like confectioneries. Because acetylated flour has a low paste viscosity, it can be utilized in recipes calling for a large amount of solids. Enzymes engineered to have a high viscosity paste work well as thickening agents. An appropriate amount of digestible starch would be guaranteed by the use of modified flours in food products. Additionally, by designing standards for the food processing sector based on customer needs such as those of obese and diabetic individuals who may benefit from reduced starch digestibility, this information can be leveraged to address consumer concerns. Based on their characteristics, sweet potato flour can be used in a variety of ways in the food industry due to the variety of characters and culinary advancements that have been noticed. Understanding their possible applications can aid in the large-scale farming of these crops and the flour that can be made from them. (Belay dereje (et.al)2020.

METHODOLOGY

The methodology pertaining to the present study on ” *Development of masala cookies using sweet potato powder*“ present under the following heading .

- A. steps involved in the preparation of sweet potato powder
- B. Step involved in the preparation of masala mix
- C. steps involved in the preparation of masala cookies.
- D. Quality analysis and sensory evaluation .
- E.

A.steps involved in the preparation of sweet potato powder :



a.Flow process for sweet potato powder

Procedure :

- The 200g of sweet potato was peeled using vegetable peeler.
- The sweet potato was washed with water and drained.
- The washed sweet potato was sliced into thin slices using a slicer.
- The sliced sweet potato was placed into the trays with space.
- The hot air oven was preheated to obtain the temperature of 80'c .
- The sweet potatoes on the tray were placed in the hot air oven and dried for 1 hour .
- After drying the potato, place the tray at room temperature and it will become cooled.
- The dried sweet potato was grinded to get the sweet potato flour .
- The sweet potato flour was stored in the airtight container.



A. flour obtained from sweet potato

B. Step involved in the preparation of masala mix:

Ingredients :

1. Ginger
2. Garlic
3. Red chillies
4. Curry leaves
5. Pepper
6. Mint leaves

Procedure :

- The ginger , garlic , red chillies , curry leaves , pepper and mint leaves were cleaned and washed using water.
- The ginger and garlic were peeled using vegetable peeler .
- The spices were placed in the trays .
- The hot air oven was preheated to obtain the temperature of 80'c .
- The spices on the tray were placed in the hot air oven and dried for 15 minutes.
- After drying the spices, place the tray at room temperature and it will become cooled.
- The dried spices were grinded to get the masala mix .
- The masala mix was stored in the airtight container.

C. steps involved in the preparation of masala cookies.

Ingredients :

- | | |
|-------------------|-------|
| 1. Butter | - 20g |
| 2. Powdered sugar | - 10g |
| 3. Salt | -2g |
| 4. Rice flour | -10g |

- 5. Sweet potato powder - 70g
- 6. Masala mix - 15g



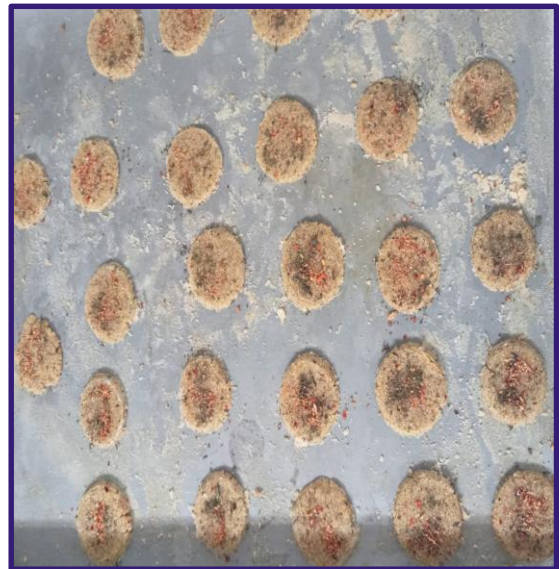
b.Flow process for sweet potato flour cookies

PROCEDURE :

- Sieve the dried ingredients using seiver .
- Blending the butter using a creaming method.
- The addition of powdered sugar and blended with the cream .
- The sweet potato powder ,rice flour and salt were blended with the mixture .
- Once the mixes were blended like a dough , the masala mix was added .
- The obtained dough is sheeted using a roller.
- After sheeting the dough was cut using the shaper .
- The masala mix was spread on the top of the dough .
- The thickness of the dough before baking - 0.3mm
- Place the dough into the trays with 3 cm distance one among them
- The oven was preheated for 10 minutes at 120°c.
- Bake the cookies at 200°c for about 20 minutes.
- After baking, the cookies were stored in an airtight container.



B. Preparation of Dough



C. Shaped dough before baking .



D. Masala cookies obtained from sweet potato flour.

D.QUALITY ANALYSIS AND SENSORY EVALUATION :

The masala cookies obtained from the sweet potato flour was prepared and the quality analysis were determined using the physical characteristics of the masala cookies . these were compared with the standard values of the cookies .

PHYSICAL CHARACTERISTICS :

WEIGHT :

The weight of the dough after blending all the ingredients was determined. And the weight of the dough is 150g. The weight of the cookies was determined with the milligram weighing scale immediately after baking and cooling . The total weight of the cookies obtained after baking was 97g. There were 25 cookies obtained and each cookie had a weight of 3.66g.

THICKNESS :

The cookies were allowed to cool for approximately 30 min after baking. The thickness of the cookies were determined using the ruler scale with 15 cm precision. The thickness of the dough before baking was determined as 0.1mm . And the thickness of the cookies after baking was determined as 0.3mm . The thickness and its standard deviation were calculated and reported in mm.

DIAMETER :

The diameter of the cookies were determined using the ruler scale with 15 cm precision. The ruler was

placed above the cookies and the diameter was calculated. The obtained diameter of the cookies was 3.5 cm .
The standard diameter of the cookies were calculated.

SENSORY EVALUATION

Quality evaluation of prepared food products is necessary to determine the product's safety, palatability, and overall acceptance. Sensory evaluation was carried out, which is using the human senses to objectively evaluate food goods. The testers examine characteristics such as appearance, texture, size, flavor, and taste to determine product quality or potential for improvement. The panelist assigned scores for each parameter as 5 scores from poor to excellent.

APPEARANCE :

The masala cookies appeared like thin cookies and the masala mix was spread over the top of each cookie .

COLOR :

The color of the masala cookies obtained from the sweet potato flour was milky white to golden brown .

TASTE :

The masala cookies obtained from the sweet potato flour taste a little sweet and spicy. The masala mix added to the cookies has a flavor in every bite . The sweetness of the cookies was obtained because of the sweet potato flour added to it .

TEXTURE :

The texture of the cookies was coarse and crispy . The masala cookies were thin and crunchy throughout .

STORAGE :

The sweet potato flour and the masala mix were stored in the separate airtight containers .
The masala cookies obtained from the sweet potato flour were stored in the plastic airtight container. The stored masala cookies were placed at room temperature to determine the shelf life of the product .

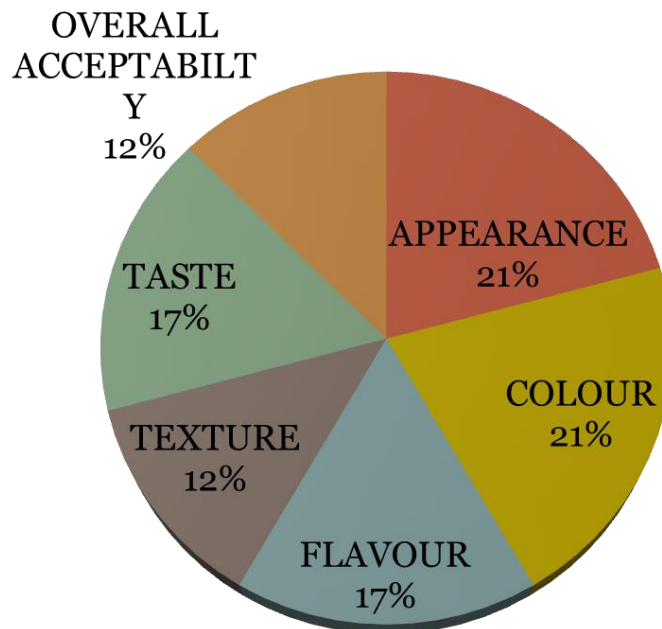
RESULT AND DISCUSSION :

The result and discussion of the present study entitled “**Development of masala cookies using sweet potato flour**” was carried out by following headings :

- A. Sensory evaluation
- B. Quality analysis
- C. Storage
- D. Shelf life

A.SENSORY EVALUATION :

Sensory evaluation consisted of judging the quality of prepared cookies by panel members. The evaluation deals with analyzing the overall sensory quality of cookies as perceived by the sense of sight, taste, and touch. A hedonic scale rating test was used to measure the degree of pleasurable and un-pleasurable experience of cookies on a scale of 5 points from poor to excellent . The panelists were given an evaluation form which listed various sensory parameters and score options with number rankings. When all the evaluation forms were complete, the data were averaged and noted. The cookies were rated for their sensory attributes like taste, texture, color, appearance, and overall acceptability.



The sensory evaluation of the masala cookies developed from sweet potato flour was judged by the 10 panel members from the students of Avinashilingam institute . The panelist assigned scores for each parameter as 5 scores from poor to excellent.The above chart denotes the percentage of taste , appearance ,color,flavor,texture , and overall acceptability of the masala cookies .



F. THE PANEL MEMBERS EVALUATE THE COOKIES

B. QUALITY ANALYSIS :

QUALITY	WEIGHT	THICKNESS	DIAMETER	TEXTURE	TASTE	COLOUR
RESULT	3.66g	0.3mm	3.5cm	Coarse and crispy	Masala flavor	Milky white to golden brown

The above table denotes the quality analysis done for the masala cookies obtained from sweet potato flour . The weight of the cookies in this table denotes the single cookie weight . The weight of the cookie was weighed using a weighing balance . The thickness of the cookies were calculated using a ruler and it was obtained that 0.3mm. the diameter of the cookies were calculated using a ruler,the result was 3.5cm . The texture of the cookies was crispy . The masala cookies were thin and crunchy throughout every bite . The masala cookies obtained from the sweet potato flour taste a little sweet and spicy. The masala mix added to the cookies has a flavor in every bite . The sweetness of the cookies was obtained because of the sweet potato flour added to the masala cookies . The masala cookies appeared like thin cookies and the masala mix was spread over the top of each cookie . The color of the masala cookies were analyzed using color analysis and it was found that the sweet potato flour color was milky white to golden brown .

C. STORAGE :

The masala cookies obtained from the sweet potato flour were stored in the plastic airtight container , it was confirmed that there were no changes in the taste , color, texture of the masala cookies. Storing cookies is the important factor to know the shelf life of the product.

D. SHELF LIFE :

The shelf life of the masala cookies obtained from sweet potato flour was determined as 10 days from time baking .

FUTURE RECOMMENDATIONS :

1. This can be an alternative for regular biscuits and it is enhance with nutrients .
2. It can be produced for selling on the health - conscious market in the future .
3. To enrich people's lives by offering nutritious , delicious , organic and healthy cookies,thus creating a better future everyday.

CONCLUSION :

Cookies have been defined as snacks that are produced from unpalatable dough which when baked in an oven is transformed into an appetizing product. Cookies have been reported to be one of the most consumed confectionery products in the world. In order to improve the nutritive value ,cookies are prepared with either fortified or composite flour.Sweet Potato being a root crop is relatively low in protein content. Sweet Potatoes may have high nutrients , which are carbohydrates and fibers. Garlic and ginger are known to be beneficial in flatulence,constipation, faulty digestion, inadequate food intake,chronic coughs, leprosy and in many other diseases. The curry leaves are reported to have a high nutritional value and are extremely rich in antioxidant vitamins, minerals, carbazole , alkaloids, polyphenols, tannins and saponins . Mint plants offer a range of antioxidant qualities and potential health benefits, especially for people who have irritable bowel syndrome. The masala cookies prepared using the sweet potato, ginger,garlic,mint leaves ,curry leaves and red chili flakes are highly nutritious than other types of cookies . The masala cookies were consumed by all ages.It is concluded that the sweet potato flour produced good results without any adverse effect on physical and sensory characteristics of cookies. It was also noted that sweet potato flour improves the flavor and texture of cookies and can significantly improve the dietary fiber and mineral contents of the product. These results can be further applied for the development of nutritious cookies.

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