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Development and Quality Evaluation of Ragi Flour Incorporated Cookie Cake

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ABSTRACT

Ragi flour can be added to baked products to formulate Calcium and iron enriched cookie cake. The objective of research to prepared nutritionally incorporated cookie cake by ragi. Calcium deficiency leading to bone and teeth disorder, iron deficiency leading to overcome by introducing finger millet in our diet. So three different samples were taken for recipe standardization and the ratios are made with 25 %, 50 % and 75 % wheat flour replacement with ragi flour. It observed that the cookie cake prepared with 50 % ragi was highly acceptable by sensory analysis. Ragi flours fortified wheat flour significantly improved the chemical composition (fat, fiber and protein and carbhohydrate). On the basis of nutritional and sensory quality, cookie cake when fortified with 50 % ragi flour resulted in better quality and nutritious cookie cake (carbohydrate content 65.63%, protein content 14.89 %, fat content 13.45 %, and ash content 1.9 %). By all means the sample 2 with 50% ragi flour incorporation was found suitable and sample 2 found best one.

Key words: *Ragi flour, Incorporated, Deficiency, Chemical and Sensory attribute.*

INTRODUCTION

Baked products have popularities in the populace because of their availability, ready to eat convenience and having good shelf life. Because of their low moisture content this ensures less chance of microbial spoilage, therefore large scale production and distribution possible. Common bakery products include breads, cookies, pastries, muffins, cake, bread etc

Finger millet (*Eleusine coracana*) also known as ragi, nachni or Nagli is one of the important millets in India. Finger millet is extensively grown on hilly areas and southern part of India and is widely consumed in the form of dumping by vast section of people. Finger millet is the rich source of Ca(300-350mg%), Phosphorus(283mg%), Fe(3.9%). Finger millet is reported to have anti ulcerative properties and finger milletdiets lowered blood glucose cholesterol in diabetic rat models.[7]

Ragi flour will provide many health benefits like ragi for losing weight, bone health, lowering blood cholesterol, for anemia and other health conditions.

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Ragi is a staple food for majority of the population in some parts ofIndia and in other developing countries. Ragi usually ranks third in cereal production in semi-arid regions of the globe, after sorghum and pearl millet. The major ragi cultivating states in India are Maharashtra and Uttaranchal. It gained a lot of importance in recent years because of its higher contents of calcium, iron and dietary fibre. The calcium content is higher than all cereals and also has good quality protein along with the presence of essential amino acids, vitamin B and phosphorus. Thus, it is a good dietary source of nutrients for growing children, expecting women, elderly people and patients.

Finger millet is usually used for preparation of flour, pudding, porridge and roti. With the change in scenario of utilization of processed products and awareness of the consumers about the health benefits, finger millet has gained importance because of its functional components such as slowly digestible starch and resistant starch. The composite flour of ragi and wheat appears not only to improve the nutritional quality but promote the health benefits. Ragi is a crop that can withstand severe drought conditions and can be easily grown throughout the year. Nutritionally, when ragi is used as a whole grain, it is higher in protein and minerals in comparison with all other cereals and millets. It is a remarkable source of protein, making it perfect for vegetarian diets.

A cookie cake is a dessert that consists of a large cookie, which is baked similarly to a batch of regular sized cookies and usually decorated with frosting. Cookie cakes are made with cookie dough, generally by adjusting the portions of existing cookie recipes in order to match the size of the pan used for baking. In America, a cookie is described as a thin, sweet, usually small cake. By definition, a cookie can be any of a variety of hand-held, flour-based sweet cakes, either crisp or soft. Each country has its own word for "cookie." We know as cookies are called biscuits in England and Australia, in Spain they're galletas. Germans call them keks or Plzchen for Christmas cookies, and in Italy there are several names to identify various forms of cookies including amaretti and biscotti, and so on. The name cookie is derived from the Dutch word koekje, meaning "small or little cake." Biscuit comes from the Latin word biscoctum, which means, "twice baked."

Table 1: Nutritional value

Nutrients	Per 100gm
Energy	336
Total carbohydrate	72.6
Protein	7.7
Fibre	3.6
Fat	1.5
Calcium	344(mg)
Iron	3.9(mg)
Niacin	1.1(mg)
Thiamin	0.42(mg)
Riboflavin	0.41(mg)

(Source: USDA Nutrient Database, 2018)

MATERIAL AND METHODS

The present study is carried out in the Department of food science and technology K. K. Wagh College of Food Tech. The Material used and methods adopted for the present investigations are presented under suitable heading.

Materials

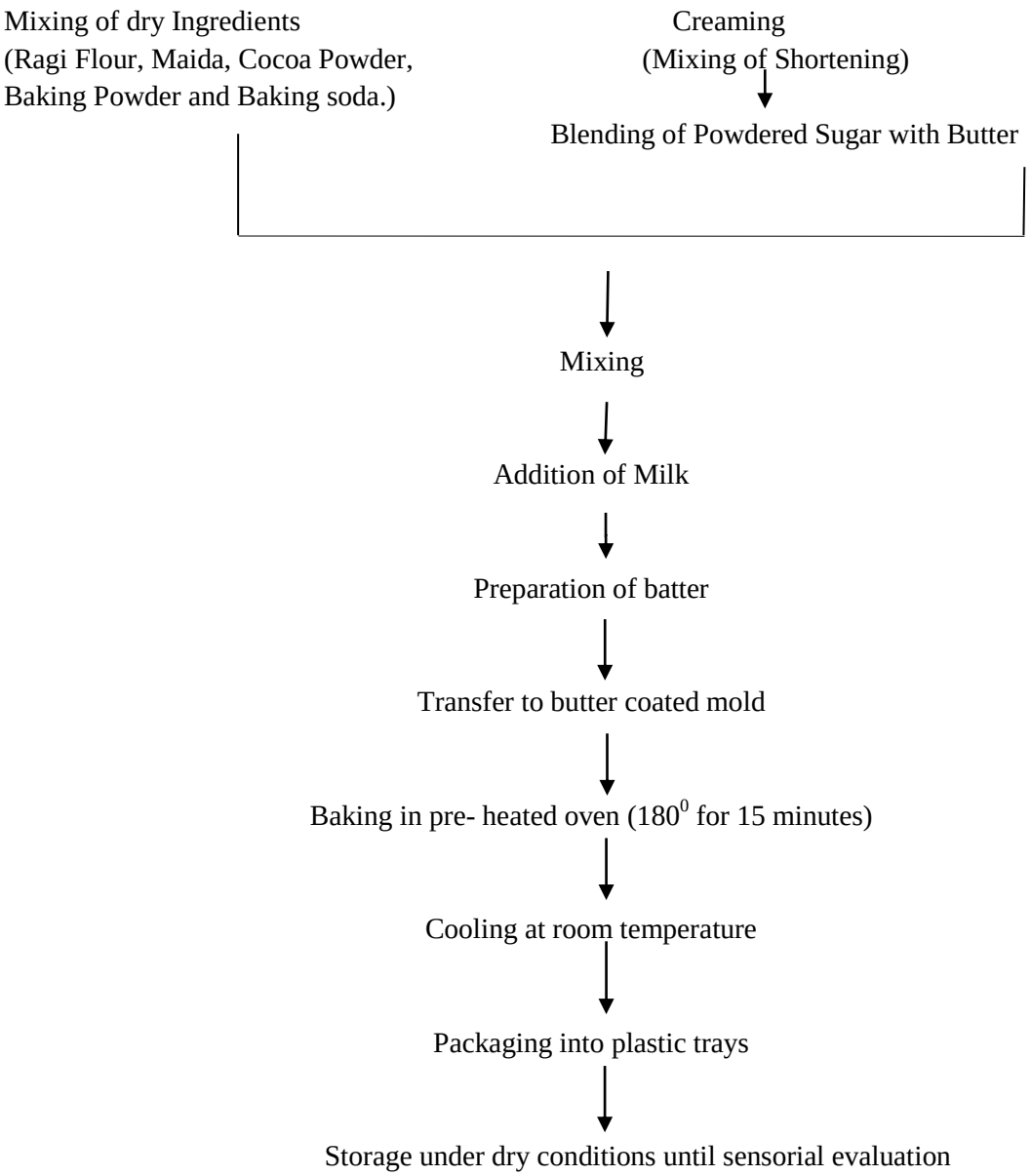
The different materials required for the entitled project like wheat flour, ragi flour, sugar,

baking powder, fat were collected from local market nashik.

Preparation of Cookie Cake

Sieve the refined wheat flour and Ragi flour, mix them. Powdered sugar added into buter, this process is known as creaming or blending. Then slowly add mixed flour with baking powder. The dough was produced by proper mixing and transfer into mold. And baking them 150 ^{0} C to 180 ^{0} c for 15 to 20 min. Then cool these cookie Cake at room temp and then packaging.

PREPARATION OF COOKIE CAKE FLOW SHEET



Flow Sheet No. 1.1: Preparation of Cookie-cake

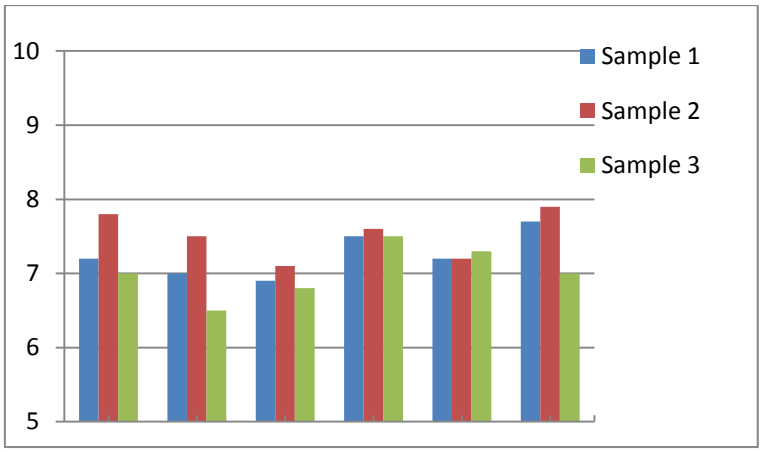
RESULTS

SENSORY EVALUATION OF COOKIE CAKE:

Sensory evaluation of the sample was carried out by trained sensory panel member using nine point's hedonic scale. Attributes like taste, colour, appearance, flavour and overall acceptability was scored based on its intensity scaled. 9-Point Hedonic Scale has been used for the purpose. The sensory score given by the panel have been evaluated for the sensory result. The result of sensory analysis are given below in graph.

Table 2: Average Sensory Score

Sample	Organoleptic score					
	Colour	Taste	Flavor	Texture	Appearance	Overall acceptability
Sample 1	7.2	7.0	6.9	7.5	7.2	7.7
Sample 2	7.8	7.5	7.1	7.6	7.2	7.9
Sample 3	7.0	6.5	6.8	7.5	7.3	7.0



Graph No. 1.1: Average sensory analysis data.

CHEMICAL ANALYSIS

The result of chemical analysis shown in Table B. Moisture was determined as per method of A.O.A.C. Total protein was determined by micro Kjeldhal method according to A.O.A.C. The fat content was determined by the method of A.O.A.C. using soxhlet apparatus. Crude fibre was determined by using A.O.A.C. method. For Ash estimation smples were kept in muffle furnace at 550^0C for 6 hr.

RESULT OF CHEMICAL ANALYSIS

Table no 3: Nutritive value per 100 gm.

Sr. No.	Parameter	Result
1.	Ash	1.9 %
2.	Moisture	11.3 &
3.	Fat	13.45 g.
4.	Protein	14.89 g.
5.	Carbohydrate	65.63 g.

CONCLUSION

In the present investigation attempts have been made to study the effect of incorporation of Ragi flour on the sensory and nutritional utilities of cookie cake. The result of the analysis and test show that the incorporation of ragi flour 50 % is found to be most acceptable to obtain cookie cake with improved nutritional quality and satisfactory sensory attributes. In present study the efforts are made towards the nourishment of cookie cake with ragi flour. So three different samples were taken for recipe standardization and the ratios are made with 25%, 50 % and 75 % wheat flour replacement with ragi flour. Therefore these results show that even though the addition of ragi flour increases significantly the fat content of cookie cake, baking performance and sensory quality attributes are affected adversely when more than 50 percent ragi flour is used to replace the wheat flour.

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