

Mini Review

Received: 07 March, 2024

Accepted: 18 April, 2024

Published: 22 April, 2024

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Citation: Mallepula B, Dandu A (2024) Development
of HIGH FIBER NUTRI-RICH MUFFIN to combat
malnutrition. *Rea Int J of Food and Nutrition*. 1(1):
001-003.
DOI: 10.37179/rijfn.000001

Development of HIGH FIBER NUTRI-RICH MUFFIN to combat malnutrition

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Abstract

These days people have gotten accustomed to completely relying upon processed food to fulfill their daily energy requirements. As time evolved many healthy foods like millets were left behind by the modern generation and convenience foods were adopted. These lifestyle changes made them suffer from lots of disorders over time. This new product is a small trial to re-introduce those nutrient-rich but abandoned foods into the daily diet in a modernized way. A Few of the nutritive but rejected foods like millet, apple peel extract, and defatted soybean flour were selected and made into a pie so that people could consume it with ease. **Keywords:** Benthic Organisms, Peninsular Malaysia, Coastal Ecosystem.

Product Development

Preparation of apple peel extract

Fresh apples are rinsed and peeled. The Apple peel obtained was blanched and then sun-dried for 23 days (300c temperature to get rid of moisture in them. These dried apple peels were then ground to make them into powder [1].

Process for millet muffin preparation

GELATION: Flaxseed powder is added to water and left for 30 minutes to form into a gel.

SIFTING: Millet flour, defatted soy flour, apple peel powder baking powder, and baking soda are sieved for aeration.

CREAMING AND WHISKING: 5gm of powdered sugar is mixed with 5gm of butter till it melts forming a creamy substance, then gelled flax seeds powder is added and whisked (as if egg whites are whisked) which creates foam in the mixture.

To Whisked mix, the sifted flour is added, which makes the batter ready to bake. Before baking flavoring agents such as 15gm of condensed milk powder and 0.5gm of cardamom powder are added to the batter. Later, the cake batter is poured into greased cupcake molds and oven-baked for 20-25 min at 170°C. After baking the muffins were left to cool down for 5min, unmolded, and packed.

Review of Literature

RAGI MILLET: Millets had been the major staple food in central and southern India for centuries till the time of the Green Revolution. After the advent of high-yielding varieties of Rice, wheat during the 1970s millets got side-lined from our food basket. (Villa A Topani Director of Indian Institute of millet research in Hyderabad). Among all the millets, finger millet flour has often been reported to have overall low starch digestibility & low glycemic index [2]. Ragi millet is very nutritious concerning minerals, essential amino acids, best quality protein, vitamin A, and B complex, calcium, phosphorous, and iron. It protects from CVD's various cancers and neurological disorders [3].

DEFATTED SOY FLOUR: One of the nutritional problems in most of the developing world is protein-calorie malnutrition. The use of inexpensive high-protein calorie resources is highly recommended. Thus, fortification of any food product with soybean flour can drastically improve the protein quality of the food [4]. Defatted soy flour is a potential source of food protein, amino acids, ash, and isoflavones [5].

APPLE PEEL EXTRACT: Apples and apple peels specifically have been associated with multiple health benefits through disease prevention and maintenance of overall health [6]. Apples are important sources of phenolic compounds and have strong antioxidant capacity compared to other fruits (sun et al 2002) [7]. Apple polyphenols have various in vitro bioactivities, possibly in

combination with dietary fiber (i.e., reduced risk of coronary heart disease) [8] Flaxseeds are native to India & are a staple food crop. In India, flaxseeds are consumed as food & as well as for medicinal purposes. It enjoys a good status among oil seeds because of its versatile uses. It has emerged attractive nutritional food because of its exceptionally high protein & phytoestrogen [9].

Flaxseeds comprise a high amount of fiber and are a significant source of α linolenic acid in the diet of vegetarian people. It provides functional properties & health benefits. Omega 3 fatty acids, lignan & dietary fiber are major bio-active components of flaxseeds [10].

NEED OF PRODUCT IN CONTEMPORARY ERA: The product is made with all the nutritive ingredients it can be consumed by all age groups. It is a baked good that can be included in the diet as a dessert and can be given to children at snack time. As the soy flour used is defatted, all the goitrogens and other toxic materials are removed from it, and it is safe to be consumed. It is a highly nutritious snack-time food, a good source of carbs, protein, fiber, calcium & iron. Though it provides high calories presence of complex carbs and fiber helps to regulate the blood glucose level.

SENSORY ANALYSIS: 3 samples were developed with differences in composition of ingredients namely sample A (70:20:5:5), B (75:15:5:5) & C (80:10:5:5) with compositions ragi flour: soya flour: apple peel: flax seeds respectively. Sensory analysis of muffins was done according to a 9-point hedonic scale parameter by semi semi-trained panel in Satavahana University College of Science in the Department of Food Science and Technology. Sample "A" having a proportion of 70:20:5:5 (ragi flour: soya flour: apple peel: flax seeds) gains the highest score on semi trained panel. The color, texture, taste, flavor, and overall Acceptance were evaluated by a 9-point hedonic Scale.

FLOW CHART

Mix sugar with Butter to form cream.
Add flaxseed gel to cream and whisk well.



Add Sifted flour & flavorings to whisked mix.



Transfer the content into mold and bake at 170°C for 25 minutes.



De-mold after cooling, pack, and store

FLOW CHART

NUTRITIVE COMPOSITION:

INGREDIENT	WEIGHT gm	ENERGY Kcal	PROTEIN gm	FAT gm	FIBER gm	CHO gm	CALCIUM mg	IRON mg
FINGER MILLET	50	168	3.85	0.75	5.75	36.3	175	1.95
FLAX SEEDS	5	26.5	1.015	1.8	0.24	1.445	8.5	0.135
APPLE PEEL POWDER	5	25	0.4	—	3	5	25	—
DEFATTED SOY FLOUR	10	29	5.1	0.2	1.8	3.2	35	2
CONDENSED MILK	15	53.25	1.2	1.35	—	8.325	53.25	—
SUGAR	5	19.9	0.005	—	—	4.97	0.6	0.008
BUTTER	5	36.45	0.125	4.05	—	—	—	—

A SINGLE MILLET MUFFIN (100g) CONTAINS TOTAL NUTRIENTS:

NUTRIENTS	
Energy	358.1 kcal
Protein	11.695 gm
Fat	8.15 gm
Fiber	10.79 gm
Carbohydrates	59.24 gm
Calcium	297.35 mg
Iron	4.0925 mg

Conclusions

Muffins are a good source of fiber, carbohydrates, protein, energy as well and fats which are important to maintain health and provide certain health benefits as flavonoids found in Apple peel reduce the risk of heart disease and reduce bad cholesterol levels, not only heart diseases but also reduces the risk for diabetes cancer, etc., finger millets rich in vital nutrients such as protein, calcium, iron making the muffin nutritive rich, it is also rich tryptophan, threonine, valine, isoleucine and methionine which suitable to people suffering from gluten allergy and celiac disease. The two compounds daidzein and genistein are primary isoflavones present in soybeans and help to reduce the risk of cancer of breast, colon, stomach, lung, and prostate. It also contains rich quality salts, and minerals in addition to vitamins like thiamine as well as Riboflavin. So, by this, we can conclude the product HIGH FIBER NUTRI-RICH MUFFIN is Nutritious and healthy.

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