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FORMULATION AND EVALUATION OF DATES AND FLAXSEEDS INCORPORATED BARFI

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ABSTRACT

Dates and flaxseeds Barfi is an innovative Indian sweet for a cardiovascular disease individual. It is based on a traditional north Indian sweet item “Besan Barfi”. This traditional recipe is modified to reduce the fat and sugar content of the product. This product contains no dietary fat and sugar. Dates were used as the main ingredient as it is rich in dietary fiber, which prevents LDL cholesterol absorption in the gut and makes it beneficial for cardiovascular diseases. Other ingredients like flaxseeds, sesame seeds, almonds have beneficial role in CVD. After designing this product, sensory evaluation was conducted by 14 naïve panel members and 4 expert panel members using 5 point ranking scale. The product initially scored 3/5 hence further modifications were done and the product scored 5/5. The modified product provides up to 15.6g of fiber and more over low sodium.

Keywords: Dates, flaxseeds, besan barfi, CVD.

INTRODUCTION

Cardiovascular disease (CVD) has been leading cause of morbidity in India. Recent trends indicate that the disease has escalated to young age groups also. It has a significant presence in males and females in both urban and rural populations. An estimated 17.3 million people died from CVD in 2008, representing 30% of all global deaths. Of these global deaths, an estimated 6.2 million were due to the stroke (Cardiovascular fact sheet).

Lifestyles of populations across the world have changed dramatically in the 20th century. These changes have been brought about by number of developments in Science and technology the new affect every facet of human existence. Most human societies have moved from agrarian diets and active lives o fast foods and sedentary habits. Combined with increasing tobacco use, these changes have fueled the epidemic of obesity, diabetes, hypertension, dyslipidaemia and cardiovascular diseases (CVD).

Dates and flaxseeds barfi has been modified form of traditional North Indian sweet “Besan Barfi”. The traditional dish typically consists of ghee and sugar which were replaced by dates in the new product, in order to reduce the fat and improve fiber content suitable for Cardiovascular Diseases.

The present investigations were carried out to develop innovative traditional food product for cardiovascular diseases patients. Nutritional and sensory quality characteristics of the product (*Burfi*) were evaluated, where as efforts were taken to increase the shelf life of product by using different packaging materials.

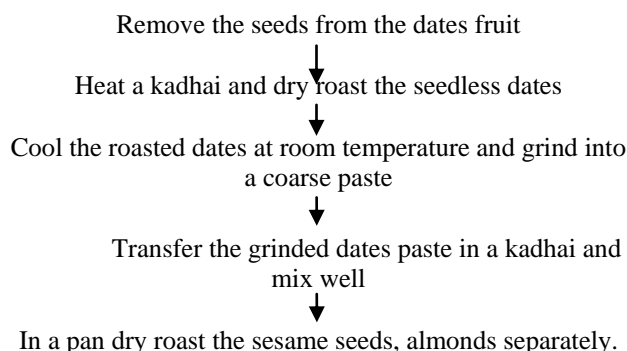
MATERIALS AND METHODS

MATERIALS

Channa flour, ghee, sugar, cardamom almonds, dates, sesame seeds, flaxseed, almonds, con flakes etc. were procured from the local market, Mumbai.

Besan barfi		Dates and flaxseeds barfi	
Chanafloor (besan)	60g	Dates	100g
Ghee	35g	Sesame seeds	15g
Sugar powder	30g	Flaxseeds	15g
Cardamom powder	10g	almonds	20g
Almonds	20g	cornflakes	30g
		Cardamom powder	10g

METHOD OF PREPARATION OF BURFI



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Add the roasted sesame seeds, almonds and flaxseeds to the dates mixture.

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Add cardamom powder and stir well

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Coarsely grind the cornflakes and add it to the dates mixture

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Grease the plate with a drop of ghee and spread cornflakes powder on it

↓

Mix the dates mixture well and allow it to set for 15mins at room temperature.

↓

Garnish with almonds and cut into cube

NUTRITIONAL ANALYSIS

The nutritional evaluation of supplementary foods i.e. moisture content, fat content, protein content, ash content, crude fiber, fatty acid was carried out by A.O.A.C method.

SENSORY EVALUATION OF PRODUCTS

Prepared *Panjiri* were subjected to sensory analysis based on 9-point hedonic scale for color, taste, texture, flavour and overall acceptability using a panel of 10 members who are familiar with the product since childhood. Panel members were advised to use verbal descriptions and convert them into scores. The scores were based on the following criteria: Like extremely: 9; Like

moderately: 7-8; like slightly: 5-6; dislike slightly: 3-4; and dislike extremely: 0-2. The scores were averaged and rounded to the nearest whole number.

EVALUATION OF THE PRODUCT

Sensory evaluation was done to find the acceptability of the product on the basis of ranking scale with the characteristics of color, texture & aroma, concept, taste and after taste. This test was done by 14 naive panel members and 4 expert panel members. The ranks were categorized as 1 – poor, 2 – fair, 3 – good, 4 – very good and 5 – excellent.

STATISTICAL ANALYSIS

The data includes mean scores for each sample as tested by both un-trained and semi-trained panelists. The results of sensory evaluation were split by panelist type and each group was individually subjected to one way analysis of variance (ANOVA) test was used to determine the differences of the mean scores for appearance, smell, taste, consistency, and general acceptability at $P < 0.05$.

RESULTS AND DISCUSSION

Compositions of the formulated foods besan burfi and date and flaxseed burfi are given in Table 1 and 2. The amounts of various staples (cereals) and supplements (legumes) were calculated to provide 292 kcal and raise the protein level to 8% NPE as one third infants energy and protein requirement per day (Dewey and Brown, 2003). A comparison with the traditional

Table 1 - Besan barfi

Ingredients	Amount (gm)	Energy (kcal)	CHO (gm)	Protein (gm)	Fat (gm)	TDF (gm)	Na (mg)
Chanaflour	60g	223.2	35.8	12.48	0.33	9	43.92
Ghee	35g	315	-	-	35	-	-
Sugar	30g	120	30	-	-	-	-
almonds	20g	131	2.1	4.16	11.78	-	-
Cardamom powder	10g	2.29	4.21	1	0.22	-	-
Total		791.49	72.11	17.64	47.33	9	43.92

Table 2 - Dates and flaxseeds barfi

Ingredients	Amount (gm)	Energy (kcal)	CHO (gm)	Protein (gm)	Fat (gm)	TDF (gm)	Na (mg)
Dates	100g	144	33.8	1.2	0.4	7.7	-
Flaxseeds	15g	81	4.5	3	5.7	4.11	-
Sesame seeds	15g	84	3.75	2.7	6.48	2.55	-
Almonds	15g	98.25	1.57	3.12	8.83	-	-
Cornflakes	30g	101	24	2	-	1	202
Cardamom powder	10g	22.9	4.21	1.02	0.22	-	-
Total		531.15	71.83	13.04	21.63	15.36	202

Table 3 - Comparison between traditional besan barfi and dates and flaxseeds barfi

Sr. No	Nutrients	Units	Besan barfi	Dates and flaxseeds barfi	RDA for men	RDA for women
1	Energy	kcal	791.49	531.15	2320	1900
2	CHO	gm	72.11	71.83	-	-
3	Proteins	gm	17.64	13.04	60	55

4	Fat	gm	47.33	21.63	25	20
5	TDF	gm	9	15.36	-	-
6	Na	Mg	43.92	202	-	-

Standardization of product

Ingredients	Amount
Dates	100gms
Flaxseeds	15gms
Sesame seeds	15gm
Almonds	15gm
Cornflakes	30g,
Cardamon powder	10gm

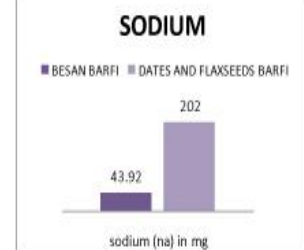
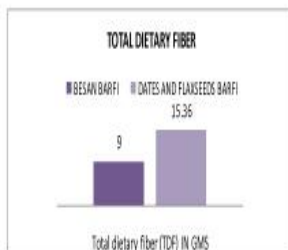
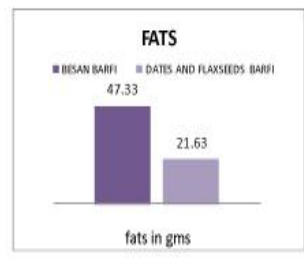
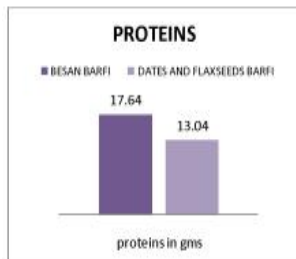
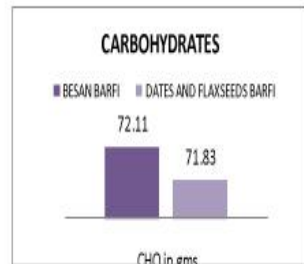
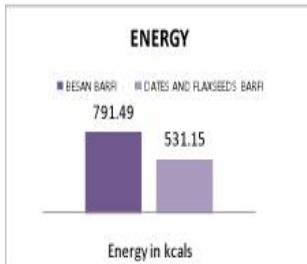


Table 4 – Sensory evaluation report

Result 1			
Characteristics	Naive panel members (average)	Expert panel members (average)	Out of
Colour	3	3	5
Texture & aroma	3.5	3.5	5
Concept	4	4	5
Taste	3	3.5	5
After taste	3.5	3.5	5
Total	17	17.5	5
Result -2			
Characteristics	Naive panel members (average)	Expert panel members (average)	Out of
Colour	4	4.5	5
Texture & aroma	4.5	4.5	5

Characteristics	Naive panel members (average)	Expert panel members (average)	Out of
Colour	5	5	5
Texture & aroma	5	5	5
Concept	5	5	5
Taste	5	5	5
After taste	5	5	5
Total	25	25	25

Certainly modified food product has lowered the total energy, carbohydrates and has no sugar as compared to traditional recipe. It contains good amount of minerals, total dietary fiber (TDF) and low fat as compared to the traditional recipe. Traditional recipe is higher in fats than modified product. The fats in the traditional recipe are more of saturated fat as it is provided by ghee but modified product contains fat from flax seeds, sesame seeds, almonds which provide ω 3 and ω 6 fatty acids. In sensory evaluation the product was ranked “excellent” from both the panel members. The product was acceptable.

DISCUSSION

Flaxseeds are not only high in α linolenic acid (ω -3 fatty acids) but also in fiber, lignans and micronutrients. Meta- analysis consisting 28 studies including flaxseeds intervention concluded that whole flaxseeds lowered serum total and LDL cholesterol especially in postmenopausal women with high cholesterol levels at baseline (Pan *et al.*, 2009). Parameswari and Nazni (2012) reported in their study that incorporation of roasted flaxseed powder in foods were significantly reduced serum total cholesterol, serum LDL, cholesterol, serum HDL cholesterol, triglycerides level.

Sesame contains high levels of natural antioxidants like sesamin, sesamol and sesamol which prevent it from oxidative free radical damage to a great extent. Sesame is rich in ω -6 poly unsaturated fatty acids. Sesame ingestion improved blood lipids and antioxidant status. Subjects consuming sesame seed powder for 5 weeks showed a significant reduction in plasma total cholesterol, LDL cholesterol, LDL to HDL cholesterol ratio, reactive substances in oxidized LDL (Wu *et al.*, 2006).

Phytosterols present in sesame seeds are shown to lower cholesterol. Sesame is rich in calcium. Almonds are a very good source of vitamin E, manganese, biotin, and copper. Almonds are a good source of magnesium,

molybdenum, riboflavin (vitamin B2), and phosphorus. Fortunately, although one-quarter cup of almonds contains about 11 grams of fat, a sizable portion of it (7 grams) is heart-healthy monounsaturated fat. In this study of 12 patients with elevated LDL cholesterol levels, a diet containing almonds and other nuts, plant sterols (also found in nuts), soy protein, and soluble fiber (in high amounts in beans, oats, pears) reduced blood levels of all LDL fractions including small dense LDL (the type that most increases risk for cardiovascular disease) with near maximal reductions seen after only 2 weeks. Fresh dates compose of soft, easily digestible flesh and simple sugars like fructose and dextrose. The fruit is rich in dietary fiber, which prevents LDL cholesterol absorption in the gut. Additionally, the fiber works as a bulk laxative. Thus this product which is an amalgamation of all these functional foods is widely suitable for people who are suffering from lifestyle disease.

CONCLUSION

The product was ranked “good” during the first sensory evaluation test. Furthermore improvements were done and sensory evaluation ranked the product “excellent” by both the panel members and the product was then standardized. Dates and flaxseeds barfi the main ingredient is dates and flaxseeds. Dates are rich in dietary fiber and barfi was further enriched with flaxseeds, sesame seeds which have made this product a functional food with high biological value.

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