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MULTIGRAIN BAKED CHAKLI FOR OBESITY

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ABSTRACT

Chakli was developed as a savoury snack for obese people. Chakli is a maharashtrian delicacy that was developed from 'BHAIJANI'. The traditional recipe of bhajni i.e fried chakli was modified in order to improve its fat and fibre content. Multigrain Baked chakli possessed oats in it which was fibre rich that helped in losing weight and avoid other disorders like CVD, Diabetes Mellitus and other risk factors. It's other ingredients like chilli flakes, sesame seeds; curry leaves showed their benefits in obesity. When baked chakli was compared with traditional fried chakli or bhajni it was adequate for obesity and more nutritious also as it possessed low fat and sodium and high amount of fiber in it. After designing the product sensory evaluation was conducted by using a 5 point rating scale for analyzing the modified product. The product was standardized.

Keyword: Baked chakli, Bhajni, Obesity.

INTRODUCTION

Obesity is defined as having an excessive amount of body fat. Obesity is more than just a cosmetic concern, though. It increases your risk of diseases and health problems such as heart disease, diabetes and high blood pressure.

Obesity is diagnosed when an individual's body mass index (BMI) is 30 or higher. The body mass index is calculated by dividing your weight in kilograms (kg) by your height in meters (m) squared. Chakli is originally made from rice flour and is deep fried. As health is a major concern, in our day-to-day life, nutritious and health beneficial products are on high demand. Keeping this in mind, a new innovative idea of making a multi grain chakli was introduced. Multigrains and Oats are the main ingredient of the recipe. The multi grain includes chana Dal, moong Dal, tuar Dal, rice, oats with added flavors such as Chili flakes, sesame seeds, dried Curry leaves and turmeric powder also the fiber content of the modified product was higher as compared to traditional recipe and the fat and sodium content was lower.

MATERIALS AND METHOD

DEVELOPING THE FOOD PRODUCT

- Bhanjni flour was replaced with multigrain flour that included 2 dals, oats and rice in it.
- Olive oil and sesame seeds was used as they are rich in ω 3 and 6 fatty acids instead of refined oil.
- Oats were added in the dough as they are rich in fibre, which will increase the transit time and provide satiety.
- Sesame seeds that are rich source of calcium were also added.

- Curry leaves which are rich in fibre and iron were also added.

METHOD OF PREPARATION

- Roast all the Dals and sesame seeds
- ↓
- Grind them all together,
- ↓
- Add Rice flour to it, Add olive oil and mix well
- ↓
- Add chilli flakes. Add Roasted sesame seeds
- ↓
- Add salt, chilli powder, dhanya powder, chat masala
- ↓
- Make fine dough and make it in chakli form with the help of chakli maker
- ↓
- Bake it at 180 degree celcius in an Oven for 10-15 mins



Table 1 - Developing of the food product from traditional recipe

Fried chakli		Multigrain baked chakli	
Rice	60 gm	Tuar dal	15 gm
Split black gram skinless(dhuli urad dal)	40 gm	Chana dal	5 gm
Chilli powder	1tbsp	Oats	25 gm
Turmeric powder	¼ tsp	Moong dal	15 gm
Salt	5 gm	Rice flour	20 gm
Refined oil	40 gm	Olive oil	5 gm
		Sesame seeds	5 gm
		Chilli flakes	3 gm
		Dhanya powder	5 gm
		Salt	To taste
		Chilli powder	1 tbsp

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 *multigrain baked chakli* 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 colour, texture, aroma, concept, taste and after taste. This test was done by 14 naïve panel members and 4 expert panel members.

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

Certainly the modified food product has lowered the total energy content as compared to traditional recipe and it contains good amount of calcium. The 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 normal oil but modified product contains fat from olive oil, sesame seeds which provide ω3 and ω6 fatty acids. The product which was made by keeping obese patients in mind was accepted by all the panel members and experts as well, initially the product was marked as “very good” and later in the second results it was marked as “Excellent” in taste and aroma and after taste with the help of 5 rating scale method.

Table 2 - Fried chakli

Ingredients	Amount (gm)	Energy (kcal)	CHO (gm)	Protein (gm)	Fat (gm)
Rice	60	200	42	5	1
Dhuli urad dal	40	133	22.6	9.3	1.3
Salt	5	-	-	-	-
Refined oil	40	390	-	-	40
Total	125	723	64.6	14.3	42.3

Table 3 - Multigrain Baked chakli

Ingredients	Amount (gm)	Energy (kcal)	CHO (gm)	Protein (gm)	Fat (gm)	Fiber (gm)
Tuar dal	15	50	8.5	3.5	0.25	0.8
Chana dal	5	18.6	3	1.04	0.28	1.14
Oats	25	96	15.54	3.82	3.82	4.65
Moong dal	15	50	8.5	3.5	0.25	0.8
Rice flour	20	66.6	14	1.6	0.33	0.6
Olive oil	5	42	-	-	-	-
Sesame seeds	5	28	1.25	0.9	2.16	2.9
Total	90	351	39.25	14.3	7.9	10.89

Table 4 - Comparison between traditional fried chakli and Multigrain baked chakli

Sr. no	Nutrients	Units	Bhajni	Multigrain Baked chakli
1	Energy	kcal	723	351
2	CHO	gm	64.6	39.25
3	Protein	gm	14.3	14.3
4	Fat	gm	42.3	7.9
5	Fiber	gm	8	10.89

RESULTS OF SENSORY EVALUATION

Table 6 – Sensory evaluation 1

Characteristics	Naïve Panel members (average)	Expert Panel Members (average)	Out of
Colour	4	4	5
Texture and aroma	4	3.5	5
Concept	4	4	5
Taste	4	4	5
After taste	4	4	5
Total	20	19.5	25
Percentage	80%	75%	100%

Table 7 - Sensory evaluation 2

Characteristics	Naïve Panel members (average)	Expert Panel Members (average)	Out of
Colour	4	4.5	5
Texture and aroma	5	5	5
Concept	4	4	5
Taste	5	5	5
After taste	5	5	5
Total	23	23.5	25
Percentage	92%	94%	100%

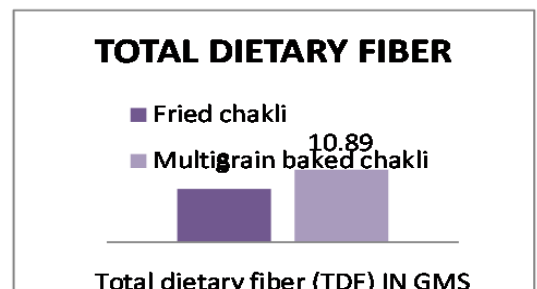
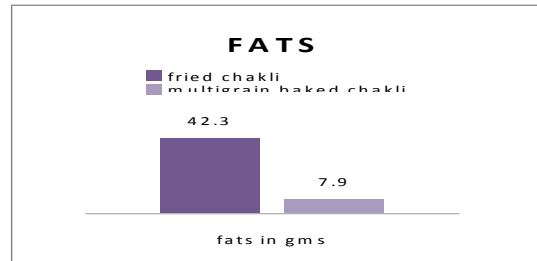
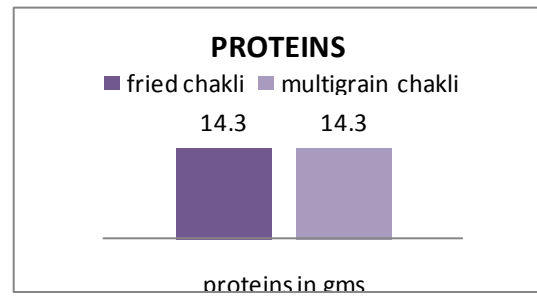
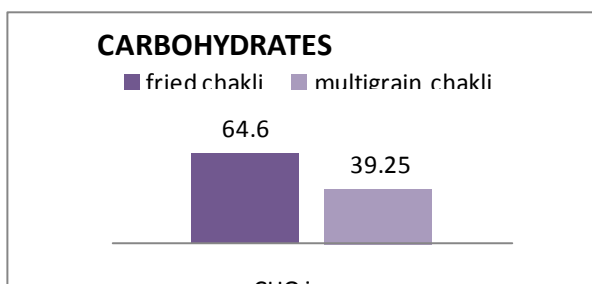
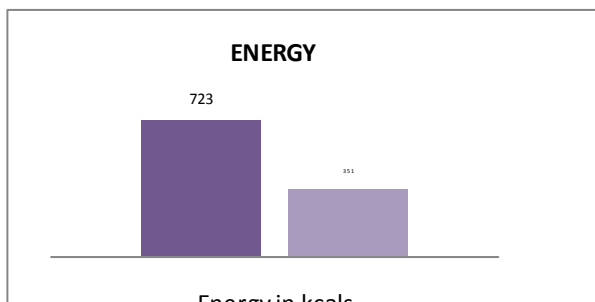


Figure 1 – Nutrient analysis of multigrain baked chakli

DISCUSSION

One serving contains 10.48 grams of dietary fiber. The amount supplies approximately 48% of the Food and Nutrition Board’s recommended dietary allowance of the fiber for the average adult. Compared to rice, Oats contains a much higher concentration of fiber. According to a 2009 study published in “Nutrition Reviews” Hamid M,*et al.*, a diet rich in fiber foods may lower the risk of obesity, stroke, high blood pressure, heart disease, diabetes, elevated blood cholesterol and digestive problems. Oats provides good amount of soluble fiber beta glucan which has a role in lowering cholesterol and thereby risk of CVD. A study published in the journal "Physiology and Behavior" looked at the effect of hot red pepper intake on energy balance and appetite. Sesame seeds -: source of copper and manganese and calcium, sesame seeds reduce cravings for sweets, improves metabolism and helps maintain silhouette. It contains sesamol, sesamin, sesamol which are the antioxidants present in sesame. - Sesame seeds lower "bad" cholesterol and improve digestion, helping to improve bowel problems. As the soluble fiber of oats is digested, it forms a gel, which causes the viscosity of the contents of the stomach and small intestine to be increased. The gel delays stomach emptying making you feel full longer which helps with weight loss. New research suggests that children between ages 2-18 years old who have a constant intake of oatmeal lowered their risk of obesity. The research found that the children who ate oatmeal were

50% less likely to become overweight, when compared to those children that did not eat it.

CONCLUSION

Form this study it was concluded that modified product is higher in fiber, lower in fat and energy as compared to traditional recepie. It is a modified product keeping obese patients in mind and the aim is highly fulfilled. It contains good amount of protein, total dietary fiber (TDF) and low sodium as compared to the traditional recipe. In sensory evaluation it was market very good in concept and colour and Excellent in taste, after taste and aroma.

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