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FORMULATION OF HORSE GRAM COOKIES WITH INCORPORATION OF NIGER SEEDS AS A FUNCTIONAL INGREDIENTS

Ashwini Raibagkar¹, Siddhi Shinde², Shruti Patil³, Priyanka Khot⁴, Amruta Kamate⁵

¹Assistant.Professor, Department of Food Technology, CNCVCW, affiliated to Shivaji University, Kolhapur (India)

²Research Student, Department of Technology, Shivaji University, Kolhapur (India)

³Research Student, Department of Technology, Shivaji University, Kolhapur (India)

⁴Research Student, Department of Technology, Shivaji University, Kolhapur (India)

⁵Research Student, Department of Food Technology, Akkamadevi Women's University, Vijaypur (India)

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Abstract:

Improper nutrition is one of the important causative factor that leads to increased susceptibility to bacterial, viral and parasitic infections The World Health Organization (WHO) has announced dietary guidelines during the COVID-19 outbreak stressing the importance of a balanced diet to maintain a strong immune system and to minimize susceptibility to infections. Thus administration of proper diet is thus leading factor for preventing COVID-19 pandemic. The research study was conducted to develop nutritious cookies. The product was developed by using Whole wheat flour, Horse gram flour and Oats flour and incorporating it with Sesame seeds, Niger seeds and Almond powder. The cookies were baked at 160^oc for 15 minutes in oven. Proximate analysis and Sensory evaluation of cookies were conducted by standard methods. The results of proximate analysis revealed Moisture 0.32%, Total minerals 1.84gm%, Crude protein,13.27gm, Crude fat 33.59 gm, Crude fiber 0.81gm, Carbohydrate 50.17gm,calcium 179.05 mg, Iron 3.84mg and Energy 556.07kcal/100gm. High content of protein, calcium and iron were found in modified cookies compared to the locally available market cookies. The cookies were found to be acceptable in sensory evaluation and nutritionally superior compared to the locally available market cookies.

Keywords: Horse Gram, Oats, Niger seeds, Sesame seeds, Protein, Iron, Calcium

1. INTRODUCTION:

Cookies are one of the best known snack product. The main ingredients used for cookies are refined wheat flour, sugar, shortening agents, leavening agents and flavour. In the present study we developed nutritious cookies by using Whole wheat flour, Horse gram flour and Oats flour and

further incorporation of sesame seeds, niger seeds and almond powder into the cookies in order to develop cookies rich in energy, protein, calcium and iron. Horse gram is an inexpensive source of protein and is also rich in minerals such as calcium, phosphorus, iron and vitamins such as carotenes, thiamine, riboflavin, niacin and L-ascorbic acid. Niger seeds are also called as nigella seeds and are an extremely rich source of Iron which is 56.7 g/100 g. Niger seeds help to strengthen immune system, improves heart health and functioning of digestive system. Wheat is considered good source of protein, minerals, B- group vitamin and dietary fiber. The loss of vitamin and mineral in the refined wheat flour has led to widespread prevalence of constipation and other digestive disturbances and nutritional disorders. Raw oats are rich in a powerful soluble fiber called beta-glucan and are also a relatively good source of protein. Butter is rich in vitamin A and calcium. Sesame seeds are excellent source of phosphorous, iron, magnesium, calcium, manganese, copper & zinc. Almonds naturally contain monounsaturated and polyunsaturated fatty acids, proteins and fibers and variety of essential nutrients including vitamin E and several trace elements.

There lies a big challenge in front of whole world to fight against Covid-19 pandemic. Optimal nutrition and dietary nutrient intake impact the immune system. Therefore the only sustainable way to survive in current situation is to strengthen the immune system by proper nutrition.

MATERIALS AND METHOD:

The present study was conducted at the Department of Food Technology and Management, College of Non Conventional Vocational Courses For Women, CSIBER, Kolhapur.

2.1 PROCUREMENT OF MATERIAL:

For the present investigation, ingredients namely .Horse gram flour, Whole Wheat flour, Oats flour, Butter, Sugar, Almond powder, Niger seeds, Sesame seeds, Baking powder were procured from the local market of Kolhapur city.

2.2 PREPARATION OF RAW MATERIAL:

2.2.1 Flour Preparation:

The flours i.e. Whole wheat flour and Horse gram flour, Oats flour were sieved two times to remove bran particles and other foreign particles.

2.2.2 Butter Preparation:

Butter was beaten by using beater for 15-20 minutes.

2.2.3 Other Material Preparation:

All ingredients were weighed by using weighing machine.

2.3 FORMULATION OF COOKIES:

2.3.1 Standardization of control sample

Different combinations were conducted for preparation of control. Three combination such as sample A1, sample A2 and sample A3 of wheat flour and niger seeds in ratio of 30:5, 25:10 and 20:15 were prepared and remaining ingredients like oats flour, butter, sugar, almond powder, sesame seeds, baking powder were added as shown in table to increase the overall acceptance of control sample of cookies

Ingredient	Sample A1 (%)	Sample A2 (%)	Sample A3 (%)
Whole wheat flour	30	25	20
Niger Seeds	05	10	15
Oats flour	10	10	10
Butter	30	30	30
Sugar	15	15	15
Almond powder	05	05	05
Sesame seeds	05	05	05
Baking powder	0.3	0.3	0.3

Table No 1 - Formulation of control sample

1.3.2 Formulation of test sample

Different combinations were conducted for preparation of test samples. Three combination such as sample B1, sample B2 and sample B3 of wheat flour, and horse gram flour in the ratio of 25:5, 20:10 and 15:15 were prepared and other different ingredients like oats flour, butter, sugar, almond powder, niger seeds, sesame seeds, baking powder were added in as shown in table.

Ingredient	Sample B1%	Sample B2%	Sample B3%
Whole wheat flour	25	20	15
Horse Gram flour	5	10	15
Oats flour	10	10	10
Butter	30	30	30
Sugar	15	15	15
Almond powder	05	05	05
Niger seeds	05	05	05
Sesame seeds	05	05	05
Baking powder	0.3	0.3	0.3

Table No 2- Formulation of test samples

2.3.3 Process for preparation of Cookies

Weighing of Ingredients



Roasting of niger seeds, sesame seed and almonds



Grinding of niger seeds, sesame seeds and almonds



Sieving of wheat flour, horse gram flour, oats flour and baking powder



Creaming of butter and sugar for 5 min



Mixing



Rolling



Moulding



Baking (160^oc for 15 min.)



Cooling and packaging

Figure No.1 Process for preparation of Cookies

2.3.4 SENSORY ANALYSIS

The control and test samples were evaluated for sensory attributes such as appearance, flavour, taste, texture, mouth feel and overall acceptability using Hedonic test, by semi-trained panel members.

2.3.5. CHEMICAL ANALYSIS

Chemical analysis of selected test sample was carried out for the estimation of Energy, Proteins, Carbohydrates, Fat, Moisture, Fiber, Ash, Calcium and Iron as per the approved AOAC methods.

3 RESULT AND DISCUSSION:

3.1 Sensory Evaluation of the Control Sample:

Hedonic rating test was carried out to check for acceptability of cookies. Among the 3 samples Sample A1 was selected. The Sample A1 containing 30 g Whole wheat flour, 10 g Oats flour, 30 g Butter, 15 g Sugar, 5 g Almond powder, 5g Niger seed, 5g Sesame seed, 0.3g Baking powder, gave better overall acceptability as compared to sample A2 and Sample A3. Sample A1 was finalized as control Sample.

Sr.No.	Test	Sample A1	Sample A2	Sample A3
1	Appearance	8.1	7	7
2	Flavour	7.5	7	7.5
3	Taste	8	7.5	7.5
4	Texture	8.5	7	7
5	Mouthfeel	7.8	7	7
6	Overall acceptability	7.8	7	7

Table No 3. Sensory analysis of Control Sample

3.2 Sensory Evaluation of the Test Sample:

Hedonic rating test was carried out to check for acceptability of cookies. Among the 3 samples Sample B3 was selected. The Sample B3 containing 15 g Whole wheat flour, 15 g Horse gram flour, 10 g Oats flour, 30 g Butter, 15 g Sugar, 5 g Almond powder, 5 g Niger seed, 5g Sesame seed, 0.3 g Baking powder gave highest overall acceptability by the panel members. Sample B3 has scored greater marks in all parameters such as appearance, flavor, taste, texture, mouth feel and overall acceptability.

After sensory evaluation the selected sample B3 was evaluated for chemical analysis.

Sr.No	Test	Control	Sample B1	Sample B2	Sample B3
1.	Appearance	8.1	7	7.6	7.2
2.	Flavor	7.5	7.2	7.7	7.3
3.	Taste	8	6	8	6.8

4.	Texture	8.5	7.3	7.5	7.2
5.	Mouth feel	7.8	6.2	6.8	6.2
6.	Overall acceptability	7.8	7	7.7	8.0

Table No.4 Sensory Analysis of Test sample

3.3 Chemical analysis of the Test Sample:

After completing the sensory evaluation of cookies samples, the best acceptable sample, Sample B3 is evaluated for chemical analysis. The cookies were analyzed for moisture, crude protein, crude fat, crude fibers, carbohydrate calcium and iron.

Sr.No.	PARAMETERS	Sample B3 Values Per 100 gm
a.	Moisture	00.32 gm
b.	Total Minerals	01.84gm
c.	Crude Protein	13.27 gm
d.	Crude Fat	33.59 gm
e.	Crude Fiber	00.81 gm
f.	Carbohydrate	50.17 gm
g.	Energy	556.07 kcal
h.	Iron	03.84 mg
i.	Calcium	179.05 mg

Table no.5 Chemical Analysis of selected test sample

4. CONCLUSION:

Healthy ingredients like horse gram flour, wheat flour, oats flour, niger seed, sesame seed, almond powder, butter are used to make cookies. The main aim was to formulate cookies with high nutritional quality. The chemical analysis of sample B3 revealed that, 100 gm of cookies contains 13.27 gm of protein, 179 mg calcium and 3.84 mg iron. Thus healthy cookies in place of refined flour cookies will definitely serve as best choice for enhancing overall health and immunity.

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