Development Of Cookies Using Flaxseeds And Oats

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Abstract- *Oats bran contains beta glucans, a cholesterol lowering chemical. Flaxseed is emerging as an important functional food ingredient because of its rich contents of α-linolenic acid (ALA), lignans, and fiber. Lignans appear to be anti-carcinogenic compounds. The omega-3s and lignanphytoestro-gens of flaxseed are in focus for their benefits for a wide range of health conditions and may possess chemo-protective properties in animals and humans. In light of the above the present study was conducted to develop cheap and nutritious cookies from flax seeds and oats that can contribute significant amount of quality nutrients. A basic cookie recipe was prepared using refined flour, butter, sugar and cocoa powder. Three variations were developed using flax seeds (5g, 10g and 15g in variations) and oats (10g in variations). The product was standardized and subjected to sensory evaluation. Out of the three variations, a variation II was more acceptable. The results were statistically analyzed to be insignificant in comparison to the basic with variation I and significant for the variation II and variation III. The samples were subjected to nutrient analysis and the calcium content was significantly high in variations compared to basic.*

Keywords- Flax seeds-Lignans , Oats- B-Glucans

I. INTRODUCTION

"Cookies" is chemically leavened product also known as "biscuit". Generally the term biscuit is used in the European countries and cookies in the US. Biscuit and biscuit like products have been made and eaten by man for centuries. Oats (Avena Sativa L.) ranks around sixth in the world cereals production statistics following wheat, maize, rice, barley and sorghum. They are good source of proteins, fibre and minerals. The amount of oats used for human consumption has increased progressively, the fact health effects of oats benefits mainly on the total dietary fibre and B- glucancontent **.** The bran and germ of oats also contain phytochemicals including tocopherols, tocotrienols, phenolic compounds and plant sterols, thought to have a beneficial effect on health. Oats is reported as, they used for their antioxidants, anti-inflammatory, moisturizing and even ultraviolet protecting properties .Oats are thought to play a role in glucose and insulin response levels, as the viscosity generated by B-glucan is thought to delay glucose absorption, resulting in a lower glycemic response. Also shown that person having type 2 diabetes, the consumption of whole oats products or B-glucan enriched products resulted in a lower glycemic response and also healthy and hypercholesterolemic individuals, glucose response after eating was lower following consumption of oats products or B-glucan enriched products.

Flaxseed provides oil rich in omega-3, digestible proteins, and lignans. In addition to being one of the richest sources of α-linolenic acid oil and lignans, flaxseed is an essential source of high quality protein and soluble fiber and has considerable potential as a source of phenolic compounds. Flaxseed is emerging as an important functional food ingredient because of its rich contents of α-linolenic acid (ALA), lignans, and fiber. Lignans appear to be anti-carcinogenic compounds. The omega-3s and lignan phytoestrogens of flaxseed are in focus for their benefits for a wide range of health conditions and may possess chemo-protective properties in animals and humans. Hence, this study was conducted to develop a high quality nutrient dense cookie which can be consumed by all age groups.

II. PRODUCT FORMULATION

The method of preparation of cookies is almost the same for both the basic and variations. There was a minor difference in the preparation of basic and the variations as they include flax seeds and oats.

III. METHOD OF PREPARATION

1. Beat butter, sugar thoroughly till soft, and then add essence to it and mix.
2. To this, add all the flours, flax seeds, oats, baking powder and water if required.
3. Mixed the contents properly and make soft dough.
4. Using a wooden rolling pin, the dough was sheeted to a uniform thickness of 2.5m
5. The sheeted dough was baked at 180 degree centigrade preheated oven for 15 minutes

TABLE: 1 COMPOSITION OF COOKIES

Ingredients	Basic (g)	Variation I (g)	Variation II (g)	Variation III (g)
Refined wheat flour	40	32	27	22
Powdered Sugar	20	21	21	21
Butter	30	27	27	27
Cocoa Powder	10	5	5	5
Oats	-	10	10	10
FlaxSeeds	-	5	10	15
Vanillaessences	Few drops	Few drops	Few drops	Few drops
BakingPowder	Pinch	Pinch	Pinch	Pinch

Result of Sensory Analysis: Hedonic rating scale was used for the overall acceptability, results as follow:

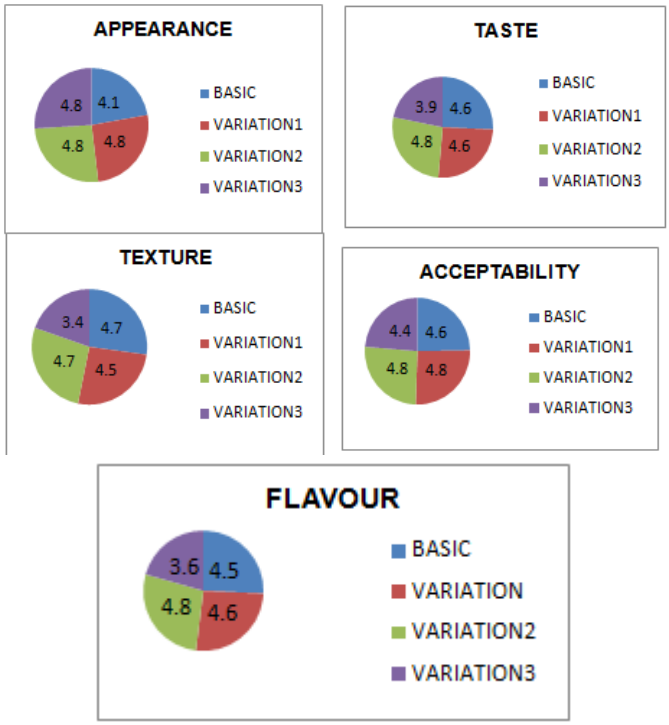

Figure 1: COMPARISION OF SENSORY EVALUATION FOR COOKIES – BASIC AND VARIATIONS

Statistical Analysis: The data collected from the palatability and acceptability trials was compiled and classified't' test was applied to find out the significance of difference between the mean scores of the sensory properties of the basic and variations.

Table 2: T' TEST FOR VARIATION I IN COMPARISION WITH BASIC COOKIES

Serial no	Sensory attributes	Mean values of basic	Mean values of variation I	't' value	Result
1	Appearance	4.1	4.8	1.75	Insignificant
2	Flavor	4.5	4.6		
3	Texture	4.7	4.5		
4	Taste	4.6	4.6		
5	Acceptability	4.6	4.8		

Note: critical value of't' at p 0.010 is 2.1

TABLE 3. 'T' TEST FOR VARIATION II IN COMPARISION WITH BASIC COOKIES

Serial no	Sensory Attributes	Mean values of basic	Mean values of variation II	't' value	Result
1	Appearance	4.1	4.8	6.8	Significant
2	Flavor	4.5	4.8		
3	Texture	4.7	4.7		
4	Taste	4.6	4.8		
5	Acceptability	4.6	4.8		

Note: critical value of 't' at p 0.010 is 2.1

TABLE 4. 'T' TEST FOR VARIATION III IN COMPARISION WITH BASIC COOKIES

Serial no	Sensory Attributes	Mean values of basic	Mean values of variation III	't' value	Result
1	Appearance	4.1	4.8	2.9	Significant
2	Flavor	4.5	3.6		
3	Texture	4.7	3.4		
4	Taste	4.6	3.9		
5	Acceptability	4.6	4.4		

Note: critical value of 't' at p 0.0101 is 2.1

Table 5: COMPARISION OF NUTRITIVE VALUE OF COOKIES-BASIC AND VARIATIONS

Cookies	Energy (Kcals)	Protein (g)	Fat (g)	Carbohydrate (g)	Iron (mg)	Calcium (mg)
Basic	469	6.72	25.7	52.8	1.11	19.6
Variation I	450	6.366	24.9	50.8	1.40	23.38
Variation II	459	6.851	26.9	48.5	1.41	30.73
Variation III	468	7.316	28.5	46.3	1.41	38.08

Table 6: RESULTS FOR NUTRIENT ANALYSIS

	Moisture %	Ash %	Total Iron mg/100g	Calcium mg/100g
Variation II	2.43	1.14	1.26	28.96

Moisture, Ash, Total Iron and Calcium content were analyzed using standard procedures of the AOAC (1975) of the most accepted cookies (Variation II)

IV. SUMMARY AND CONCLUSION

Cookies have an important place when we dial the product of baking industry. These are made by the same general methods as are used in making conventional cakes. So this study was an effort in the direction of producing low cost cookies suitable for all age groups. Cookies were prepared using oats and flax seeds in variations which are low cost and contain good nutrient profile though they are consumed very less as a snack item. The same method of preparation was followed for preparing both the basic and variations. All the variations were formulated and standardized by conducting repeated trials.

Panel of ten judges evaluated the palatability and acceptability of the products. The palatability of the basic and the variations were accepted in the terms of appearance, texture, taste and acceptability. Statistical analysis of the palatability trials has shown that the't' value of variation II and variation III was significant compared to basic The nutritive value of the basic and variations were calculated. The basic recipe provided 469kcal while variations provided 450,459 and 468 kcal respectively. The decrease in the energy content in the variations is attributed to the incorporation of oats and flax seeds and the decrease in the content of wheat flour. The basic recipe provided 6.72 g of protein while that of variations was 6.366 g, 6.851 g and 7.316 g respectively. The carbohydrate content of the basic recipe was 52.8 g while that of variations was 50.8 g, 48.5g and 46.3 g respectively. The calcium content of the basic recipe was 19.6mg while that of the variations was 23.38mg, 30.73mg and 38.08 mg respectively. The iron content of the basic recipe was 1.11 mg and that of the variations was 1.40mg, 1.41mg and 1.41mg respectively. The calcium and iron content of the variations increased due to incorporation of oats and Flax seeds. The products were subjected to nutrient analysis. The moisture content of the variation II was 2.43% respectively. A low level of moisture content in the product gives a greater shelf life; there by can be stored for a longer period of time.The ash content of the variation II was 1.14%. The iron content of the variation II was 1.26. The calcium content of the variation II was 28.96. The total cost of the basic recipe was 13.05, while that of the variations was 12.00, 12.35 and 12.40. .

From the finding of the present investigation it can be concluded that the cookies developed using oats and flax contains appreciable amount of nutrients.

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