



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research  
Vol. 8, Issue, 8, pp. 19574-19576, August, 2017

**International Journal of  
Recent Scientific  
Research**

DOI: 10.24327/IJRSR

## Research Article

### ORGANOLEPTIC ASSESSMENT AND NUTRITIVE VALUE EVALUATION OF COOKIE DEVELOPED USING FLAXSEEDS

Ritu Pradhan\* and Khwaish Sethi

Government Home Science College, Sector 10, Chandigarh

DOI: <http://dx.doi.org/10.24327/ijrsr.2017.0808.0722>

#### ARTICLE INFO

##### Article History:

Received 15<sup>th</sup> May, 2017  
Received in revised form 25<sup>th</sup>  
June, 2017  
Accepted 23<sup>rd</sup> July, 2017  
Published online 28<sup>th</sup> August, 2017

##### Key Words:

Value added products, Flaxseed, Cookie,  
Biscuit, Sensory characteristics, Nutritive  
Value

#### ABSTRACT

The present research work was carried out for development, standardization, organoleptic assessment and nutritive value evaluation of Cookie a value added product developed using functional food, flaxseeds. Whole flour and flaxseed powder blends were prepared in three samples with ratio of 50:0(C), 30:20(S1), 20:30(S2) respectively. Standardised procedures were followed for developing and standardizing recipes, organoleptic assessment (standardized 9 point hedonic scale by pre trained panel of judges) and nutritive value calculation (DietCal-Version 5). Flaxseed incorporation did not modify the colour, flavor and taste of standard recipes but improved nutritive value of the recipes significantly for all major macro and micro nutrients. Recipes fortified at both the levels 20% and 30% were acceptable. Thus, value added products developed using functional food flaxseed are suggested as they taste good, provide preventive health benefits in decreasing cardiovascular diseases, diabetes, defense against various types of cancer and other chronic degenerative diseases.

Copyright © Ritu Pradhan and Khwaish Sethi, 2017, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

#### INTRODUCTION

Flaxseeds are scientifically known as *Linum usitatissimum* L and in Latin *usitatissimum* means 'most useful'. People from centuries have been consuming flaxseed due to its good flavor and nutritional properties (Newkirk, 2008). Flaxseeds provides its health benefits due to the presence of  $\alpha$ -linolenic acid (ALA), the essential  $\omega$ -3 fatty acid, and phytochemicals such as lignans.

Flaxseed confers its health benefits on heart due to the presence of  $\alpha$ -linolenic acid (ALA) and  $\omega$ -3 fatty acid (Bloedon & Szapary, 2004; Madhusudhan, 2009). Flaxseed ingestion has been linked to reduce risk of cardiovascular disease (Carter 1993; Mantzioris *et al.* 2000; Paschos *et al.* 2007) also there is a potential role for flaxseed in management of diabetes and hypercholesterolemia (Zhang *et al.* 2007).

Due to changes in dietary pattern and subsequently in disease pattern added with increased awareness about health issues more and more people are becoming health conscious and demanding the food having high nutritional value and at the same time conferring health benefits. In this regard, the demand for flaxseeds in food and beverages, functional foods and dietary supplements has risen dramatically (Newkirk, 2008). Flaxseed is considered to be a complete functional food

due to the presence of  $\alpha$ -linolenic acid (Bozan & Temelli, 2008).

*Cookie* is a small cake made from stiff, sweet dough rolled and sliced or dropped by spoonfuls on a large, flat pan (cookie sheet).

##### Objective

Flaxseeds being a inexpensive, highly nutritious functional food providing numerous health benefits was incorporated into cookies and their development, sensory evaluation and nutritional value assessment was conducted.

#### MATERIAL AND METHODS

**Selection of recipe:** Cookie was selected as it is popular food amongst all ages particularly youngsters and children due to ease of consumption, high energy value and goodness of taste.

**Standardization of flaxseed:** Roasting of flaxseed at different time i.e. 3min, 5min, 7min. at constant temperature was done on the skillet at slow flame to evaluate the most acceptable flaxseed sample to be incorporated into the identified and selected recipe viz cookies. After grinding the roasted flaxseeds, they were sieved twice through the mesh. Sensory evaluation concluded that flaxseed roasted for 5 minutes was

\*Corresponding author: Ritu Pradhan

Government Home Science College, Sector 10, Chandigarh

found to be most acceptable by the panel of evaluators. Thus, flaxseed roasted for 5 minutes was incorporated in the cookies.

**Sample preparation:** Three samples were prepared of cookies. Standardised recipe was indexed as sample one or control termed as “C”, the second sample containing 20% of the flaxseed was termed as “S1” and third sample containing 30% of flaxseed termed as “S2” in standardized recipes.

**Preparation: Cookie-** Whole flour and flaxseed powder blends were prepared in three samples with ratio of 50:0(C), 30:20(S1), 20:30(S2) respectively. All blends were passed through mesh sieve twice for efficient mixing. In all samples ghee was added, ¼ tsp baking powder and ¼ cup sugar. The dough was prepared and kneaded manually for 5 mins and 2 tbsp of milk was added to make it moist. The dough was moulded by cookie cutter and topped with Choco chips. The moulded cookies were baked in bakery oven at 200 degree Celsius for 20 mins. The cookie samples were cooled for 30 mins and presented for sensory evaluation to the trained panelist.

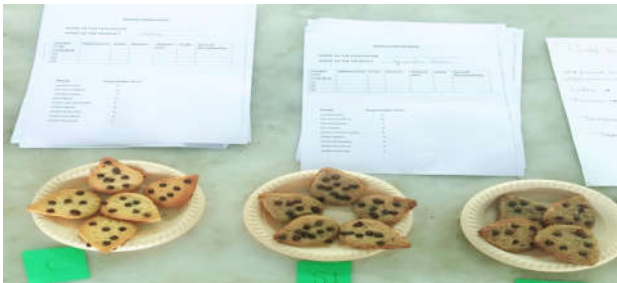


Figure 1 Samples of Cookies

**Sensory evaluation:** Sensory evaluation was the best suited method for the evaluation of selected recipes. Cookies were evaluated for overall acceptability (color, appearance, flavor, texture (crispness) and taste) and was carried out as per 9 point hedonic scale, by the help of 6 semi trained evaluators. Sensory evaluation was done to determine the most acceptable ratio of flaxseed incorporation in the samples and overall acceptability of the same.

**Calculation of Nutritive Value**

Recipes were standardized and their nutritive value was calculated using DietCal-(a tool for dietary assessment and planning) ©Profound Tech Solutions 2014. (Software Version: 5.00).

**RESULTS AND DISCUSSION**

The sensory evaluation was carried out as per 9 point hedonic scale, the sensory characteristics that were taken into consideration includes color, taste, appearance, texture (crispness), flavor, and overall acceptability. It is evident from the sensory evaluation scores by the evaluators, the recipe that scored most, contained 20% of flax seed and scores ranged in 7.1 to 8.1 which depicted that the recipe were liked very much. Overall acceptability of the sample S1 achieved highest score. Sensory evaluation of cookies was evaluated at three levels. The appearance of cookies made without flaxseed was scored as highest (8.3) amongst other two samples due to the color change as color also attained high score for the control sample (7.8).

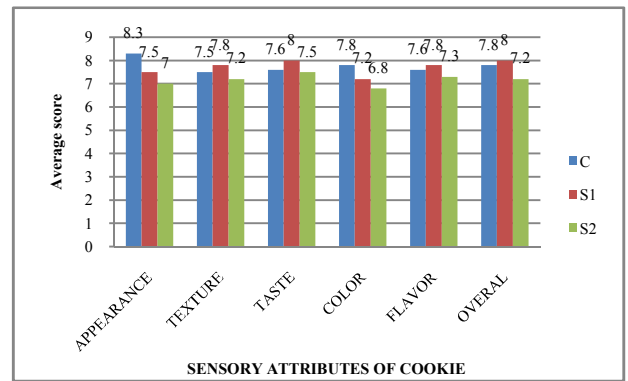


Figure 2 Average score of organoleptic evaluation of three variations of cookie

However, some changes in the colour of the cookies were observed. The darker crust color may be due to Maillard reaction between reducing sugars and proteins (Raidi and Klein 1983).

Whereas sample1 (20% flaxseed) attained highest scores in flavor, texture, taste and overall acceptability by the panel members. Hussain *et al.* (2006) found that biscuits supplemented with 25 and 30% of flaxseed flour were less accepted than those made only with wheat flour. Alpaslan and Hayta (2006) evaluated the sensory quality of bakery products prepared with corn, soybean, and flaxseed flours. Cake formulations by substitution of wheat flour with flaxseed flour (30%) flour were very well acceptable. The crispness is the most versatile texture parameter, and the most widely used term in describing food texture (Grizotto and De Menezes 2002). It is well known that texture is the sensory property that most affects the quality of processed foods particularly baked products like biscuits and cookies

Table 1 Nutritive value of three variations of cookies per 100 g of edible portion.

Nutrient Name	Nutritive Value C	Nutritive Value S1	Nutritive Value S2
Moisture (g)	11.1556	44.2672	45.2828
Protein(g)	17.1222	23.7391	26.9109
Fat(g)	39.8444	70.6375	76.4344
Minerals(g)	2.9000	5.7438	6.1188
Crude fibre(g)	3.4000	3.2812	4.0312
Carbohydrates(g)	92.2444	121.0812	125.5969
Energy(kcal)	795.5556	1214.4531	1297.2656
Calcium(mg)	111.5556	172.0000	198.5625
Phosphorous(mg)	401.4444	494.1875	552.0000
Iron(mg)	4.5183	5.5102	5.9320
Total Carotene(mcg)	32.6667	36.5625	41.2500
Thiamine(mg)	0.4289	0.5542	0.5902
Riboflavin(mg)	0.1444	0.1878	0.1988
Niacin(mg)	3.3111	4.3438	4.5000
Vitamin C(mg)	0.0000	0.9844	0.9844
Magnesium(mg)	88.0000	123.7500	123.7500
Sodium(mg)	13.3333	18.7500	18.7500
Potassium(mg)	210.0000	295.3125	295.3125
Zinc(mg)	1.4667	2.0625	2.0625
Vitamin A(mcg)	133.3333	636.0938	636.0938

The table clearly depicts that nutritive value of flaxseed added cookies S1 and S2 are enhanced considerably in all the nutrients: energy, protein, fat, carbohydrates calcium, phosphorous, iron and many other nutrients depicted in the table as compared with the control standardized sample. However, significant enhancement of nutritive value has not been observed amongst the two flaxseeds fortified samples viz

S1 and S2. Therefore, addition of flaxseed not only makes the cookies taste good and improves the texture but recipe is also enriched with omega 3 and lignans that encourage heart health, prevent diabetes and cancer.

## CONCLUSION

Addition of flaxseeds to the standardized recipes made the recipes more nutritious and wholesome without adding high flavor or modifying the texture, colour and appearance of the standardized recipes significantly. On the basis of enhanced nutritive value and better organoleptic evaluation scores of cookies fortified with 20% of flaxseed incorporation of flaxseeds at such levels is suggested. Thus, considering the improved nutritive value due to addition of flaxseeds without altering its sensory characteristics, inclusion and addition of flaxseeds in various food items is suggested to prevent diseases, maintain and achieve better health conditions and improve the dietary intake.

## References

- Newkirk, D. R. (2008). *Flax Feed Industry Guide*. Canada: Flax Canada 2015.
- Madhusudhan, B. (2009). Potential Benefits of Flaxseed in Health and Disease-A Perspective. *Agric Conspec Sci*. 2(67-72).
- Bozan, B., and Temelli, F. (2008). Chemical composition and oxidative stability of flax, safflower and poppy seed and seed oils. *Bioresour Technol*. 99, pp. 6354-6359.
- Bloedon, L. T., and Szapary, P. O. (2004). Flaxseed and cardiovascular risk. *Nutr Rev*. 62, pp. 18-27.
- Daun, J., Barthelet, V., Chornick, T., Duguid, S. (2003). Structure, composition and variety development of flaxseed. In: Thompson, L., Cunanne, S. edition. *Flaxseed in Human Nutrition*. 2nd edition Champaign, Illinois, pp. 1-40.
- Oomah BD (2001) Flaxseed as a functional food source. *J Sci FoodAgric* 81:889-894
- Carter J (1993). Potential of flaxseed oil in baked goods and other products in human nutrition. *Cereal Foods World* 38:753-9.
- Mantzoris E *et al.* (2000). Biochemical effects of a diet containing food enriched with n-3 fatty acids. *American Journal of Clinical Nutrition* 72:42-8.
- Paschos GK, Magkos F, Panagiotakos D B, Votteas V, Zampelas A (2007). Dietary supplementation with flaxseed oil lowers blood pressure in dyslipidemic patients. *European Journal of Cincial Nutritrion* 61:1201-6.
- Zhang W *et al.* (2007) Dietary flaxseed lignin extract lowers plasma cholesterol and glucose concentrations in hypercholesterolaemic subjects. *British Journal of Nutrition* 98:1-9.
- Raidi, M.A. and Klein, B.P. 1983. Effect of soy or field pea flour substitution on physical and sensory characteristics of chemically leavened quick breads. *Cereal Chem*. 60, 367-370.
- Hussain S, Anjum FM, Butt MS, Khan MI, Asghar A (2006) Physical and sensoric attributes of flaxseed flour supplemented cookies. *Turk J Biol* 30:87-92
- Alpaslan, M., & Hayta, M. (2006). The effects of flaxseed, soy and corn flours on the textural and sensory properties of a bakery product. *Journal of food quality*, 29, 617-627.
- Grizotto, R. and De Menezes, H.C. 2002. Effect of cooking on the crispness of cassava chips. *J. Food Sci*. 67, 1219-1223.

### How to cite this article:

Ritu Pradhan and Khwaish Sethi..2017, Organoleptic Assessment And Nutritive Value Evaluation of Cookie Developed Using Flaxseeds. *Int J Recent Sci Res*. 8(8), pp. 19574-19576. DOI: <http://dx.doi.org/10.24327/ijrsr.2017.19576.0722>

\*\*\*\*\*