

Sensory Analysis of Pomegranate Peel Powder in the Development of Value Added Food Products

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Abstract: *The present study entitled “Sensory analysis of pomegranate peel powder in the development of value added food products” was carried out with the objective to prepare value added food product by incorporation of pomegranate peel powder, to assess the sensory acceptability of the developed value-added food product, to determine the nutritive value and cost of the prepared value-added food product. The products namely were “bread”, “cookies”, were prepared by the incorporation of pomegranate peel powder in different proportions T₁(95g wheat flour+5g pomegranate peel powder)and T₂(90g wheat flour +pomegranate peel powder), T₃(85g wheat flour+15g pomegranate peel powder)respectively for each of the product. On the basis of sensory evaluation it was observed that for bread treatment T₁and for cookies treatment T₃ scored best regarding color and appearance, body and texture, taste and flavor and overall acceptability of the product. Sensory evaluation was carried out by using the nine point Hedonic scale.*

Keywords: Pomegranate peel, Sensory evaluation

1. Introduction

Pomegranate (*Punica granatum* L.) fruits are widely consumed, fresh and in commercial products, such as juices, jams and wines. Pomegranate rind is a rich source of hydrolysable tannins of the ellagitannin group. Pomegranate rind extracts have recently attracted interest because of their potential use as natural food preservatives and nutraceuticals (Negi *et al.*, 2003). Pomegranate fruits peel is an inedible part obtained during processing of pomegranate juice. Pomegranate peel is a rich source of tannins, flavonoids and other phenolic compounds (Li *et al.*, 2006). Demand for whole wheat bread has increased considerably in the last few years because of its better nutritional image and an increasing preference for its organoleptic characteristics. Bread and baked products are the most important sources of dietary fiber in the total food consumption. Bread with high fiber addition in general is cereal diet and is more effective than low carbohydrate diabetic diet in the control of maturity-onset diabetes. Many studies on high non soluble fiber bread are available but there are not sufficient works on high fiber bread with low phytic acid content, to reduce serum cholesterol. The study aimed to determine the influence of enrichment of wheat bread with various levels of the food industry by-products; pomegranate peels flour via chemical and organoleptic analysis.. (Abdel Moneim E. Sulieman, Wisal A. M. Babiker, Vajid N. Veettil (2016).

2. Justification

Fruit peel is generally discarded in majority of fruits even when it is safe for consumption. Indeed, the peel is being recognized as one of the essential components of our diet as it contains many vital nutrients and non-nutrient compounds which play an important role in the well being. Peels of

pomegranate get washed in a large amount at the juice corners etc, whereas it can be consumed easily to make food healthier and tastier. Pomegranate peel is a rich source of flavonoids which are powerful antioxidant substances and can protect cells from cancer-causing free radicals. Although the fruits itself are said to contain flavonoids, but the highest concentration of flavonoids and phenolic compounds are contained in the skin.. (Rowayshed *et al.*, 2013)

Objective

Therefore, this study was undertaken with the following objectives:

- 1) To assess the sensory acceptability of the developed value-added products.

3. Materials and Methods

The details of the materials, procedures to be followed and techniques to be adopted during the course of present investigation have been elaborated in this chapter under the following heads:

- Experimental site
- Procurement of raw materials
- Development of value-added food products
- Organoleptic evaluation
- Experimental design

3.1 Experiment site

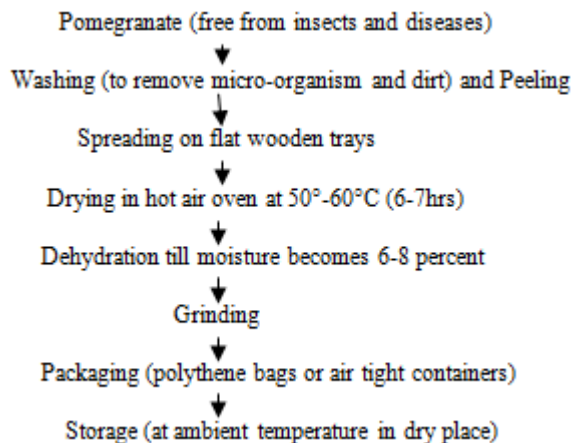
The present study was carried out in the Nutrition Research Laboratory of the Department of Food Nutrition and Public Health, Ethelind College of Home Science, Sam

Higginbottom University of Agriculture, Technology and Sciences, Prayagraj.

3.2 Procurement of Raw Materials

The main raw material was pomegranate peels which will be collected from the local fruit shops /juice shop of Prayagraj. Rest raw materials required for the study will be purchased from the local market of Prayagraj.

3.3 Preparation of Pomegranate Peel Powder



Source: - Srivastava and Kumar (2009)

3.4 Development of Value-Added Products

Value added products were developed by incorporating pomegranate peel powder. The value added product developed was to be "bread", "cookies". The standard recipe of selected product was served as control (T_0) three treatments i.e. incorporated by pomegranate peel powder on different levels as T_1 , T_2 , T_3 respectively of the products. The products were prepared by using standard recipes.

3.5 Experimental Design

Details of treatments: The basic recipes were standardized and serve as control T_0 , Three treatments i.e. incorporation of pomegranate peel powder at different levels referred to as T_1 , T_2 and T_3 respectively for four products developed. The treatments of the product are shown in the table below:

3.5.1 Details of treatments

Name of the snacks	Product treatment	Wheat	Pomegranate Peel Powder
Bread	T_0	100%	
	T_1	95%	5%
	T_2	90%	10%
	T_3	85%	15%
Cookies	T_0	100%	
	T_1	95%	5%
	T_2	90%	10%
	T_3	85%	15%

The treatments were prepared as follows:

T_0 (control): In this standardized recipe were followed to prepare the products without incorporation of pomegranate peel powder.

T_1 (5percent): In this treatment 5 percent pomegranate peel powder is added to the product incorporated with wheat.

T_2 (10percent): In this 10 percent of pomegranate peel powder is added to the product incorporated with wheat.

T_3 (15percent): In this treatment 15 percent pomegranate peel powder is added to the product incorporated with wheat.

Replications: The experiment was replicated three times to get an average value.

3.6 Organoleptic Analysis of the Developed Product

The sensory evaluation of the prepared product was done by the panel of 5 judges selected from the faculty member of the Ethelind College of Home Science. The various sensory attributes like color and appearance, body and texture, flavor and taste, overall acceptance will be assessed. The sample was placed before the judges with sample code. The evaluation will be done on the 9 points Hedonic scale-based score card. (Srilakshmi, 2011)

3.7 Statistical Analysis

The data was analyzed by using ANOVA, CD and other appropriate statistical analytical methods (Chandel, 2006).

4. Result and Discussion

Organoleptic characteristics of the prepared products

Organoleptic characteristics of Bread

Table 4.1: Average sensory score of bread

Control and Treatments	Parameter				
	Color	Texture	Taste	Flavor	Overall acceptability
T_0	8.16	7	7.33	7.66	7.86
T_1	8.4	7.7	7.7	8.13	8
T_2	7.73	7	7	7.86	7.86
T_3	7	7.66	7.36	7.46	7.4

Colour

It shows the mean sensory scores of bread in relation to color indicates that T_1 had the highest score 8.4 followed by T_0 (8.16), T_2 (7.73) and T_3 (7). It is quite obvious that treatment T_1 was liked very much and treatment T_3 was liked moderately regarding to the color of bread.

Texture

It shows that the mean sensory scores of bread relation to taste indicates that T_0 had the highest score 7.73 followed by T_1 (7.7), T_2 (7), and T_3 (7.36). It is quite obvious that T_1 was liked very much whereas T_2 was liked moderately regarding the texture of bread.

Taste

It shows that the mean sensory score of bread in relation to taste indicates that that T_0 had the highest score 7.73 followed by T_1 (7.7), T_3 (7.36) and T_2 (7). It is quite obvious

from the table T₀ was liked very much whereas treatment T₂ was liked moderately according to the taste.

Flavor

Table 4.1.1 shows that the mean sensory score of *bread* in relation to flavor indicates that that T₁ had the highest score 8.13 followed by T₂(7.86), T₃(7.4) and T₀(7.66).It is quite obvious from the table T₁ was liked very much whereas treatment T₃ was liked moderately according to the flavor.

Overall acceptability

Table 4.1 shows that the mean sensory score of *bread* in relation to overall acceptability indicates that that T₁ had the highest score 8 followed by T₂(7.86), T₃(7.4).It is quite obvious from the table T₁ was liked very much whereas treatment T₃ was liked moderately according to the overall acceptability of *bread*.

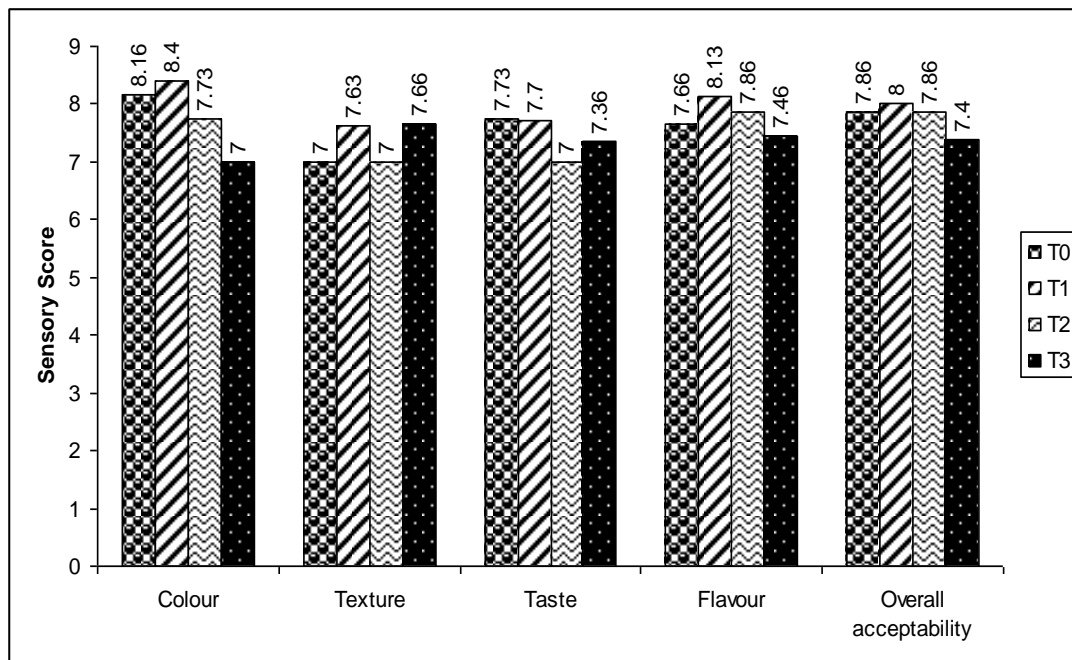


Figure 4.1: Average sensory score of *bread* of different treatments with incorporation of pomegranate peel powder

Organoleptic characteristic of cookies

Table 4.2: Average sensory scores of *cookies*

Control and treatments	Color	Texture	Taste	Flavor	Overall Acceptability
T ₀	7.73	7.53	7.53	7.33	7.4
T ₁	7.4	7.46	7.4	7.4	7.53
T ₂	7.8	7.66	7.8	7.8	7.86
T ₃	7.93	7.93	7.86	7.8	7.93

Color

Table shows that the mean sensory scores of *cookies* in relation to color indicates that T₃ had the highest score 7.93 followed by T₂ (7.8), T₀ (7.73) and T₁ (7.4). It is quite obvious from the table that the treatment T₃ was liked very much whereas treatment T₁ a powder was liked moderately regarding the color of *cookies*.

Texture

Table shows that the mean sensory scores of *cookies* in relation to texture indicates that T₃ had the highest score 7.93 followed by T₂ (7.66), T₀ (7.53) and T₁ (7.46). It is quite obvious from the table that the treatment T₃ was liked very

much whereas treatment T₁ was liked moderately regarding the texture of *cookies*.

Taste

Table shows that the mean sensory scores of *cookies* in relation to taste indicates that T₃ had the highest score 7.86 followed by T₂ (7.8), T₀ (7.53) and T₁ (7.4). It is quite obvious from the table that the T₃ was liked very much whereas treatment T₁ was liked moderately regarding the taste of *cookies*.

Flavor

Table shows that the mean sensory scores of *cookies* in relation to flavor indicates that T₂ and T₃ the highest score 7.8 followed by T₂(7.4) and T₀(7.33). It is quite obvious from the table that the treatment T₂ and T₃ was liked moderately regarding the flavor of *cookies*.

Overall acceptability

Table shows that the mean sensory scores of *cookies* in relation to overall acceptability indicates that T₃ had the highest score 7.93 followed by T₂ (7.86), T₁ (7.53) and T₀(7.4). It is quite obvious from the table that the treatment T₃ was liked very much whereas control T₀ was liked moderately regarding the overall acceptability of *cookies*.

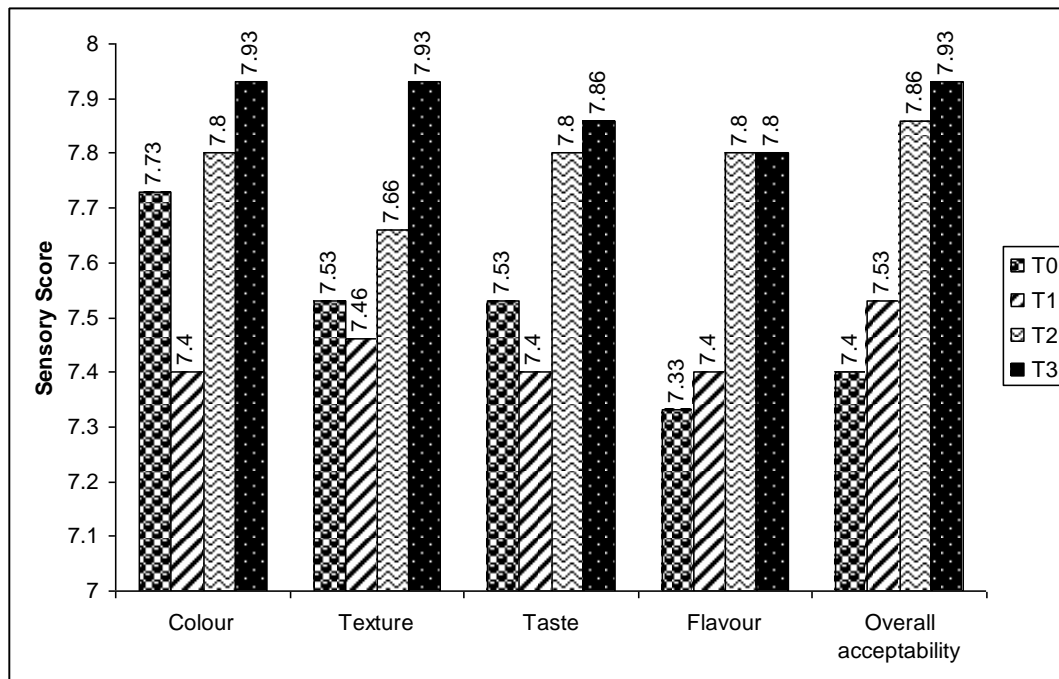


Figure 4.2: Average sensory score of different treatments of cookies with incorporation with pomegranate peel powder

5. Conclusion

As the results obtained, it is concluded that pomegranate peels possess good sensory property and many products were made by mixture of the peel powder such as bread, cookies were prepared by the incorporation of pomegranate peel powder in different proportions T₁(95g wheat flour+5g pomegranate peel powder) and T₂(90g wheat flour+pomegranate peel powder), T₃(85g wheat flour+15g pomegranate peel powder) respectively for each of the products. On the basis of sensory evaluation for the products it was observed that for bread treatment T₁ and for cookies treatment T₃ scored best regarding colour and appearance, body and texture, taste and flavour and overall acceptability of the product.

Score Card for Sensory Evaluation of the Product

Name of the product:

Date of the Presentation:

Kindly evaluate the given product on the basis of the following scores:

Like extremely 9

Like very much 8

Like moderately 7

Like slightly 6

Neither like nor dislike 5

Dislike slightly 4

Dislike moderately 3

Dislike very much 2

Dislike extremely 1

Product	Colour	Body & Texture	Flavor & Taste	Overall acceptability
T ₀				
T ₁				
T ₂				
T ₃				

Comments:

Name: Signature:

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