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Study on the physicochemical properties of the cookies enriched with guava (*Psidium guajava*) pulp

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Abstract

The global market of functional foods and demand for a healthy life style among consumers in recent year in growing, guava (*Psidium guajava*) is the healthy perishable food and a rich source of nutrient specially fibre and ascorbic acid. The present work on Study on the physico-chemical characteristics of the cookies enriched with guava pulp of L-49 variety of guava was carried out at State Institute of Food Processing Technology, Lucknow, India during the year 2016-17. There were 5 treatment produce from basic ingredient and guava pulp T1; Refined flour (100%); control, T2; guava pulp (5%)T3; guava pulp (15%)T4; guava pulp (25%)T5; guava pulp (35%). Physico-chemical observations were done to evaluate the physical changes and proximate analysis. Product was observed for weight, diameter, thickness, spread ratio, moisture and color. Result showed that in all treatment group T5 was found superior by physical characteristics.

Keywords: Physicochemical, cookies enriched, guava, *Psidium guajava*, pulp

Introduction

The global market of functional foods and demand for a healthy life style among consumers in recent year in growing (Patel *et al.*, 2016) [6]. Consumers are aware of healthy diet and they believe that an increase in consumption of fruits will help them to improve their longevity and reduce metabolic disorders (Huang *et al.*, 2005) [3]. Cookies are small, sweet, flat, dry cakes-single-serving finger food. They are generally flour based, but they can be flourless. It can be soft, chewy or crisp. They can be plain or fancy with a multitude of ingredients. Cookies are basically made from refined flour, Sugar, Butter, egg etc. Nowadays people having very busy schedule and less or no time for food preparation so they are mostly depend on ready to eat food like cookies, buns, breads, and rolls etc. which cause indigestion and constipation. In the present study guava, pulp was added to enrichment of fiber content in cookies. It is good for cleansing the digestive system, maintaining free bowel movement as well as flushing toxins out from the body. Addition of guava pulp increased nutritional characteristics of cookies. The guava fruit is an excellent source of vitamin C (Mercadante, 1999) [4] good source of calcium, phosphorus, iron and potassium which helps normalize blood pressure levels and reduce the risk of cancer (Colnlon *et al.*, 2015). It also contains β -carotene and antioxidants that are beneficial for skin health. It can be consumed in varying degrees of ripeness. This is also used in cooking as an ingredient in both sweet and savory dishes. Being this therapeutic and physical property of guava fruit, the purpose of the experiment was to study the effect of enrichment with guava pulp on overall quality Characteristics of the cookies.

Materials and Methods

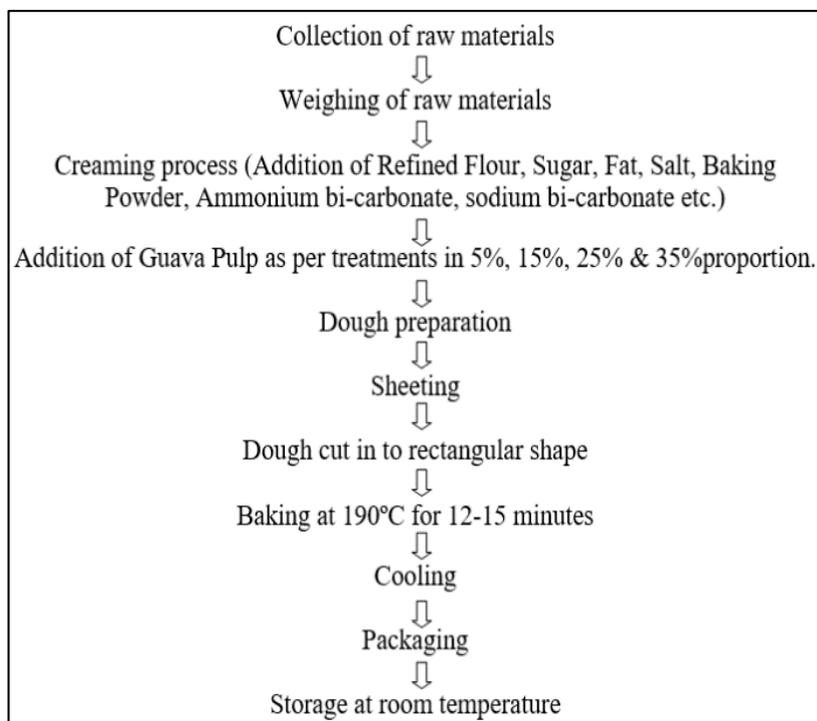
Cookies were prepared by mixing the refined flour, salt, baking powder, ammonium bicarbonate and sodium bicarbonate powder and sieving them several times so that all the ingredients get thoroughly mixed, creamed fat and sugar was added and mixed so well that no lump formation was there to this mixture rest of the ingredients were added along with guava pulp as per the following treatments;

Treatments

- T1; Refined flour (100 %) control
 T2; Refined flour (95%) and guava pulp (5%)
 T3; Refined flour (85%) and guava pulp (15%)
 T4; Refined flour (75%) and guava pulp (25%)
 T5; Refined flour (65%) and guava pulp (35%)

Cookies Preparation Method

(Modification in method of Helen Obiomaagu. and Azuka Akoli, 2014) ^[5]



Results and Discussion

Different analytical procedures were adopted to examine the changes after baking cookies at a subsequent interval like Physical, Chemical and Organoleptic observation. Physico-chemical analysis were done to evaluate the physical changes and nutritional value (Table and fig. 2) respectively. For determination of the physical characteristics, product was observed for weight, diameter, thickness, spread ratio, moisture and color. Weight of product was estimated for 5.2gm, 5.0gm, 5.6gm, 5.8gm and 6.1gm in T1, T2, T3, T4 and T5 respectively. Diameter of product was analyzed 3.5cm, 3.2cm, 3.6cm, 4.00cm and 4.5cm in T1, T2, T3, T4 and T5 respectively. Thickness of product was observed for 0.6cm,

0.6cm, 0.5cm, 0.5cm and 0.6cm in T1, T2, T3, T4 and T5 respectively. Spread ratio of product was estimated 5.83cm, 6.33cm, 7.20cm, 8.00cm and 7.50cm in T1, T2, T3, T4 and T5 respectively. Physical characteristics of all treatments are depicted in table and fig. 1. Moisture of product was 1.20%, 1.40%, 1.55%, 1.35% and 1.18% in T1, T2, T3, T4 and T5 respectively. Color Light brownish, light brownish, dark brownish, dark brownish and brownish observed in T1, T2, T3, T4 and T5 respectively. In this study the physical features of cookies showed significant difference in composition to control.

Physical analysis

Table 1: Depicts the physical properties of cookies.

S.n	Treatment	Weight (gm)	Diametar (cm)	Thickness (cm)	Spread ratio (cm)	Moisture (%)	Colour
1	T ₁	5.2	3.5	0.6	5.83	1.2	Light brownish
2	T ₂	5	3.2	0.6	6.33	1.4	Light brownish
3	T ₃	5.6	3.6	0.5	7.2	1.55	Dark brownish
4	T ₄	5.8	4	0.5	8	1.35	Dark brownish
5	T ₅	6.1	4.5	0.6	7.5	1.18	Brownish

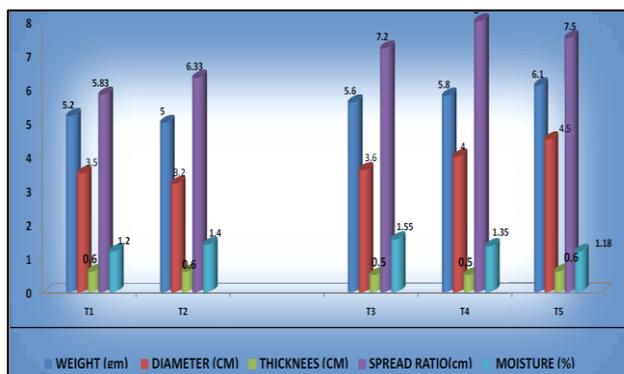


Fig 1: Depicts physical properties of cookies.

Proximate analysis

Table 2: Depicts the nutritional profile of cookies

S.n	Treatment	Protein (%)	Fat (%)	Ascorbic acid (mg/100gm)	Fiber (%)	Ash (%)	Sugar (%)	Energy (kcal)
1	T ₁	12.5	18.1	20.1	6.2	7.3	29.2	335.68
2	T ₂	11.3	18.3	20.2	6	7	29.18	367.41
3	T ₃	13.2	18.5	21	6.4	7.4	29.23	342.31
4	T ₄	14.1	18.6	21.2	6.5	7.5	29.28	347.11
5	T ₅	15.6	18.8	21.4	6.8	7.7	29.35	355.37

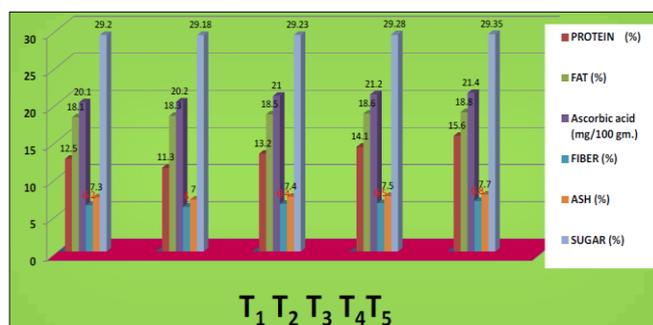


Fig 2: Depicts the nutritive value

The finding showed the fat, sugar, fiber, ash, protein, and vitamin C content significantly increased due to addition of guava pulp mean while refined flour had nothing quantity of ascorbic acid, presence of ascorbic acid is very positive character of cookies. The chemical properties of cookies are very similar to work done by (C. O. Ebere *et al.*, 2015)^[1]

Conclusion

In Finished product of T₅ was found superior by physical characteristics. In this study it is concluded that addition of guava pulp in cookies are better for human as a consumption point of view. It would be an innovative idea with good potential for bakery manufacturing sector and confer intensification to the programme for guava utilization and this would be contributed in reduction of post-harvest losses in horticultural crops.

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