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Vedant Patil

Research Scholar, K.K Wagh
College of Food Technology,
Nashik, Maharashtra, India

Pranali Nikam

Research Scholar, K.K Wagh
College of Food Technology,
Nashik, Maharashtra, India

Development and quality evaluation of puff pastry (Fenugreek)

Vedant Patil and Pranali Nikam

Abstract

This study aimed to develop a process for the development of enriched puff pastry using dried fenugreek leaves and refined wheat flour. The three different flavours for enrichment purpose were used infusing fenugreek leaves, cumin and bishop's weed. The prepared enriched puff pastry was analyzed for its different physicochemical as well as sensory qualities by adopting 9 point Hedonic scale. Among different flavours used for preparing puff pastry, the most acceptable was the one with fenugreek leaves in overall parameters.

Keywords: puff pastry, fenugreek leaves, enrichment

1. Introduction

The bakery industry in India has been in existence since long, real fillip came only in the later part of 20th century. The contributing factors were urbanization, resulting in increased demand for ready to eat products at reasonable costs etc. Importance of bakery products has expanded especially the use of whole and natural grains and other natural ingredients. Furthermore, bakery products are considered as a source of carbohydrates because starch is the main chemical constituent. (Kent, 1983.)^[12] In India, each bakery worth its name sells these bright, light, crispy, melt in mouth pieces of puff called is Khari Biscuits. They originated in several deviations: Plain (i.e. no spices), Maska Khari (with butter), Jeera Khari (with cumin), Masala Khari (with mix of spices).

The principle underlying the preparation of puff pastry is the interleaving of thin layers of fat with thin layer of dough so that upon baking a partial separation of dough strata occurs. The individual dough layers contain no leavening and undergo very little expansion during baking. Water vapour is generated in the dough but quickly passes from the dough into the intervening spaces formed by shortening layers. These space are not completely open to the atmosphere because of many dough adhesions that have formed during the repeated sheeting operations. The expanding water vapour can cause a very substantial puffing of the piece. (Bakery products by NIIR board of consultant and engineers). The history of layered doughs is thousands of years old and even puff pastry in its present form has been known for several hundred years.

Puff pastry is a light and flaky pastry made of laminated dough which can be topped or filled, sweet or savory, enabling a large range of product variations. Unlike other laminated baked goods such as croissants and Danish pastry, puff pastry is made of unleavened dough without any other rising agents. According to the so called French method the most common way to produce puff pastry a piece of fat (traditionally butter) is wrapped with basic dough, which is then folded and sheeted several times to obtain a multi-layered dough

The functional roles of fat in puff pastry making are to separate the many thin dough layers from each other and, after melting, to protect the starch granules from gelatinization. During the baking process, the water located in the dough vaporizes and generates steam which expands but cannot pass the coagulated gluten network within the dough layers. This expansion of steam between the dough layers causes the rise of the puff pastry. In addition, fat is essential as a flavor carrier and gives the final product its specific characteristics, such as a good structure and, texture and mouth feel.

The composition of fat-based food products such as vegetable oil spreads and margarines ("spreads") has evolved over the last decades Puff pastry margarines are characterized by the plasticity, which allows the margarines to be worked with and folded and extruded without

Correspondence**Vedant Patil**

Research Scholar, K.K Wagh
College of Food Technology,
Nashik, Maharashtra, India

breaking and becoming greasy. In order to obtain this margarine both the composition of the margarine, the processing and the tempering of the margarine are extremely important parameters

Maida a wheat flour from the Indian subcontinent. Finely milled without any bran, refined, and bleached, it closely resembles cake flour. Maida is used extensively for making fast food, baked goods such as pastries, bread, several varieties of sweets, and traditional flat breads. Maida is made from the endosperm and it is developed from (the starchy white part) of the grain. The bran is separated from the germ and endosperm which is then refined by passing through a sieve of 80 mesh per inch (31 mesh per centimetre). Although naturally yellowish due to pigments present in wheat. Maida is typically bleached either naturally due to atmospheric oxygen, or with any of a number of flour bleaching agents.

2. Materials and Methods

2.1 Procurement of raw materials

Good quality of refined flour, margarine, salt, custard powder, milk powder, oil, kasuri methi were purchased from local market of Nashik.

2.2 Preparation of gluten free pastry

First take weight of all ingredients for preparation of gluten free pastry. Then sieve all dry ingredients then add condense milk, butter, cocoa powder, chocolate essence. Blend that properly after that add baking powder and some water for prepare proper batter of cake. Take cake mould and grease butter on them and sprinkle flour. Pour that batter in cake mould. Put mould in baking oven at 180°C for 25 minutes. After 25 minutes cake base is ready. Remove that base in oven and cool at room temperature. Then cut base in two equal parts. Pour sugar syrup on it. Then apply whipped cream on one part of cake and also same for second part of cake then design and cut into small equal parts.

Table 1: Standardized procedure for Puff pastry (Khari) (per 1 Kg)

Sr. no.	Particulars (Raw Material)	Quantity (Kg/ Lit)
1.	Refined flour	685gm
2.	Margarin	195gm
3.	Ajwain	5gm
4.	Milk powder	5gm
5.	Custard powder	5gm
6.	Sugar	4gm
7.	Oil	16ml
8.	Salt	16gm

Table 2: Formulation of raw material (per 1Kg)

Sr.no	Ingredients	Sample 1	Sample 2	Sample 3
1)	Refined flour	685gm	685gm	685gm
2)	Margarine	195gm	195gm	195gm
3)	Custard powder	5gm	5gm	5gm
4)	Milk powder	5gm	5gm	5gm
5)	Sugar	4gm	4gm	4gm
6)	Oil	16gm	16gm	16gm
7)	Salt	16gm	16gm	16gm
8)	Water	70ml	70ml	70ml
9)	Dried Fenugreek leaves	5gm	-	-
10)	Ajwain	-	5gm	-
11)	Cumin	-	-	5gm

2.3 Experimental Plan

Figure shows the flow chart for the preparation of Puff pastry (Khari)

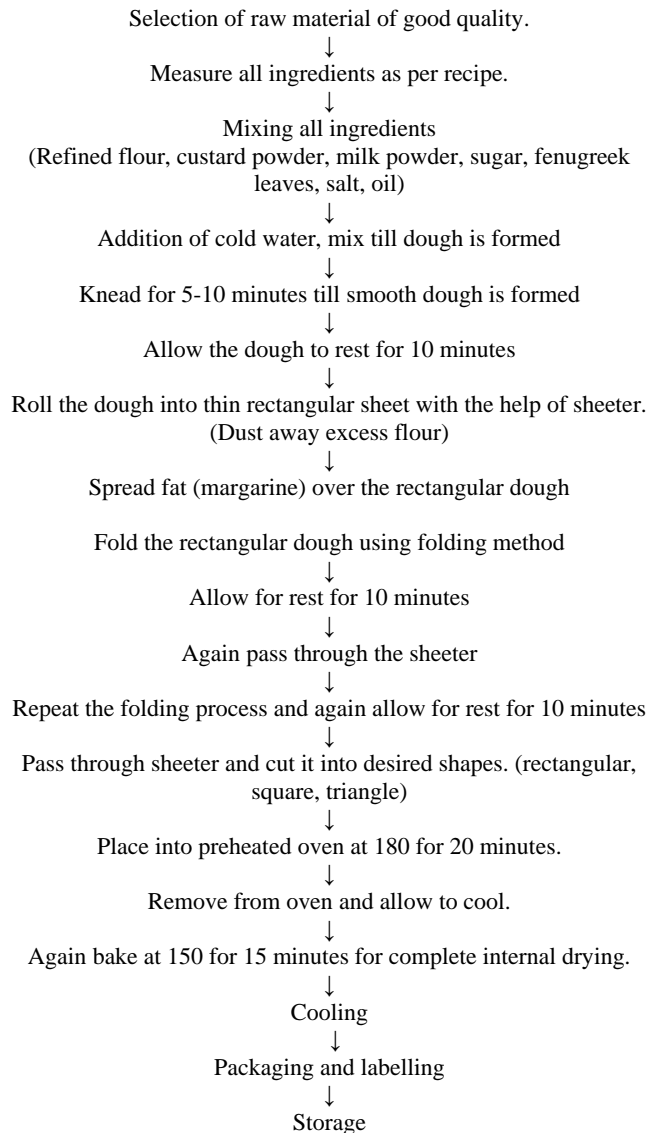


Fig 1: Process flow chart of pastry

2.4 Proximate Analysis

The moisture content of the developed Puff pastry was determined by the method described in [3.2.2]. Ash is non organic compound containing mineral content of food and nutritionally it aids in the metabolism of the organic compounds such as fats and carbohydrates. Ash content was determined as per the method given by [3.2.1]. Fat plays a significant role in the shelf life of a food product and such relatively high fat content could be undesirable in baked food product this is because fat can promote rancidity in food, leading to development of unpleasant and odorous compound. It contributes to the appearance of pastry, improves the flavour and gives a good feeling in mouth. The fat content was determined by the method described in [3.2.3]. The total carbohydrate content was estimated using method of [3.2.5]. The estimation of nitrogen was done by kjeldahl method whereas the protein content is obtained by multiplying the nitrogen value with 6.25 [3.2.4].

2.5 Sensory Evaluation

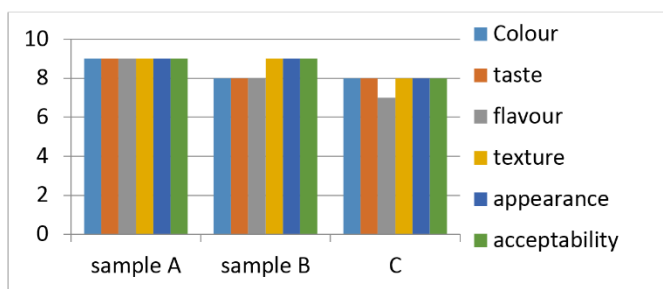
Sensory evaluation of Puff pastry samples from various flour blends was conducted using a trained panellist drawn from the general public. The test was conducted while the samples were still fresh. The panellists were required to observe the sample, taste and score. Then rinse their mouth with water before tasting another sample/product. The products were

analyzed based on the following parameters of colour, appearance, texture, taste, flavour and overall acceptability using a nine-point hedonic scale of 9 = liked extremely down to 1 = disliked extremely

3. Results and Discussion

3.1 Sensory Evaluation of Puff pastry (Khari)

The result of the sensory evaluation is shown in Table. Colour is an important sensory attribute of any food because of its influence on acceptability. The saying that the eye accepts the food before the mouth is very true. The brown colour resulting from Maillard reaction is always associated with baked goods. The Puff pastry scored between 8 to 9 on the 9 point-hedonic scale indicating that the pastry was at least like moderately. There were significant differences among the Puff pastry (Khari) 9 samples.



Graph: Sensory Analysis

3.2 Chemical Analysis

The chemical parameters viz. Ash, moisture, fat, protein, carbohydrate, energy value were measured by laboratory analysis.

3.2.1 Determination of Ash Content

A crucible and its lid are pre-weighed after thorough drying. The sample is added to the completely dry crucible and lid and together they are weighed to determine the mass of the sample by difference. The sample is placed in the hot furnace long enough so that complete combustion of the sample occurs. The crucible, lid and ash then are re-weighed.

3.2.2 Determination of Moisture

Weigh 10 gm sample accurately and subjected to oven drying at 110°C for 4-5 hour. Oven dried samples were cooled in desiccators and weighed. The drying was repeated until the constant weights were obtained or until the difference between two successive weighing was not more than 0.002g. The resultant loss in weight was calculated as percent moisture content.

3.2.3 Determination of Fat Content

Weigh the 10 gm of sample. Transfer the sample into the thimble and plug the top of the thimble with fat free cotton. Attach the thimble to the Soxhlet flask. Pour approximately 2 ½ cycle of Acetone into the tube in cycle to dip the sample

during pouring it. With heating mantle attached to the flax maintain temperature at 55°C. Extract the sample for 4 hrs of continuous heating. Remove the thimble from the apparatus and distil off the ether. Collect the extract in flax and evaporate the excess ether from fat collected by steam bath. Cool the sample and weigh it.

3.2.4 Determination of Protein Content

The ammonia is collected in boric acid and titrated with standard H₂SO₄. (AOAC 2005) The organic nitrogen from the protein and other nitrogenous compounds is converted to inorganic nitrogen (ammonium sulphate) by complete oxidation of sample with conc. H₂SO₄. The digest is treated with excess of 50% NaOH to liberate ammonia from ammonium sulphate.

3.2.5 Determination of Carbohydrate Content

Carbohydrates are dehydrated with concentrated H₂SO₄ to form "Furfural", which condenses with Anthrone to form a green colour complex which can be measured by using calorimetrically at 620nm (or) by using a red filter. Anthrone react with dextrin, monosaccharide, disaccharides, Polysaccharides, starch, gums and glycosides. But they yield of colour where is to form carbohydrate.

Table 3: Results of Chemical Analysis

Sr. No	Particulars	Value (%)
1	Moisture content	1
2	Protein	8
3	Carbohydrates	70
4	Fats	20
5	Ash content	1

4. Conclusion

There are numerous varieties of bakery products. Fat used in puff called margarine contains vitamin A. Puff Khari flour is milled soft containing low gluten. Wheat Comparable in protein but lower in starch than cake flour. Fenugreek is thought to promote digestion, induce labour, and reduce blood sugar levels in diabetics. Dried fenugreek leaves successfully incorporated in Puff pastry (Khari) to give different flavour. Different samples were prepared but Dried fenugreek leaves Puff pastry (khari) was excepted by panel. Hence in the present investigation Dried fenugreek leaves Puff (khari) was found most acceptable. Chemically Puff Pastry (Khari) contains 20% fat, 70% carbohydrates, 1% ash protein 8%. The prepared Puff (khari) will be marketed at 30 Rs per 200gm pack

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