JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

DEVELOPMENT AND CHARACTERIZATION OF A HEATHY CAKE PREMIX

PRIYADHARSINI.M [1], Dr. PRIYA.A[2]

[1]MSc FOOD AND NUTRITION, [2]ASSOCIATE PROFESSOR
DEPARTMENT OF FOOD SCIENCE AND NUTRITION,
Dr. N.G.P ARTS AND SCIENCE COLLEGE, COIMBATORE, INDIA

ABSTRACT:
Cakes are sweet baked goods known for their pleasant flavor, soft texture, and dense crumb. The development of a cake premix as a product diversification strategy is essential, as it offers extended shelf life and greater convenience—particularly valuable in today's fast-paced lifestyle, where time for food preparation is limited. The objective of this study was to develop and standardize a paneer-based cake premix, and to evaluate the physical and chemical characteristics of the final product. Paneer, apple, beetroot, and carrot were dried using a hot air oven to enhance shelf life. Paneer, being a rich source of protein and calcium, contributes unique texture and nutritional benefits to the cake.

This research aimed to create a healthy and nutritionally rich, next-generation cake premix. Three variations of the cake premix were prepared. Sensory evaluation was conducted by 50 semi-trained panelists using a 9-point hedonic scale. Among the three, Variation 2 received the highest sensory ratings. The best-performing variation was further analyzed for physicochemical properties: it contained 179 g total solids, 5.85 g fat (low), 375.7 kcal energy (high), 12.5 g protein (moderate), and 77.8 g carbohydrates. The study highlights the potential of this cake premix as a functional, marketable, and health-supportive innovative product.

Index Terms - Cake premix, Shelf life, Ready-to-eat, Physiochemical parameters, Innovational, Healthy, Convenience.

I Introduction

Cakes are sweet baked products known for their soft texture, rich flavor, and dense crumb. Developing cake premixes as a diversified product is important, as they provide extended shelf life and greater convenience—ideal for today's fast-paced lifestyle where time for cooking is limited. Incorporating emulsifiers into cake premixes enhances aeration, results in higher volume, and contributes to a softer crumb texture. (Hariyanto B – 2024).

Bakery premixes consist of a mixture of ingredients designed to provide a quick and convenient solution for baking. (Singh Gand Kaur K - 2024).

Baked goods like bread, biscuits, and cakes are highly favored due to their convenience. Sponge cake is known for its light, soft texture and porous, sponge-like structure. The single-stage mixing technique has been introduced and is commonly used in large-scale sponge cake production. (Gunadi K and Pamungkaningtyas FH- 2023).

The global consumption of bakery products is steadily rising due to shifts in eating habits and consumer preferences. Their popularity across all age groups can be attributed to their easy availability, ready-to-eat convenience, and relatively long shelf life. The demand for products made from refined wheat flour has consistently grown, surpassing that of whole wheat alternatives.(Cayres CA and Ascheri JLR et al., 2021).

Different types of milk are used in the production of paneer, and the quality of the paneer largely depends on

the quality of the milk used.(Khan SU et al., 2011).

During the Kusana and Saka Satavahana periods (AD 75–300), people consumed a solid mass that appears to be one of the earliest references to what we now know as paneer. This mass was formed by mixing heated milk with curd. Nomadic groups in Southwest Asia developed unique heat- and acid-based cheese varieties. In many parts of South Asia, Central, South, and Latin America, cheese was traditionally made using high heat and acid precipitation without the use of starter cultures—similar to how paneer is prepared in India. The nomads of Southwest Asia are likely among the first to have created several distinctive types of cheese. One such traditional cheese from Iran, known as ‘Paneer-khiki,’ was originally crafted by the Bakhtiari tribe, who spent summers in Isfahan and winters in Shiraz. In Persian, 'paneer' translates to 'container' and 'khiki' means 'skin.' The salted version of ‘Paneer-khiki’ was known as ‘Paneer-e-shour’. The term paneer is also used in Hindi to refer to the seeds of Withania coagulans, a plant-based rennet that produces a bitter curd. White paneer is a staple food among nomads in Afghanistan, where it is known as Paneer-e-khom when made from raw milk and Paneer-e-pokhta when prepared from boiled milk. A similar product is found in Mexico and the Caribbean islands.

Paneer is indigenous to South Asia and was first introduced to India by Afghan and Iranian travelers. Traditionally, milk was coagulated using heat along with sour milk, or with proteolytic enzymes extracted from creepers like Putika, or the bark of Palasa (Dhak: Butea frondosa), Kuyala, or Jujuka (Jujube).

Comparable to paneer is white, unripened cheese made by coagulating milk with rennet or acid. This type of cheese is known by various names across different regions: Kareish in Egypt, Armavir in the Western Caucasus, Zsirpi in the Himalayas, Feta in the Balkans, and Queso Criollo, Queso del Pais, and Queso Llanero in Latin America (Kumar S and Rai DC et al., 2014).

II METHODOLOGY

Research design on DEVELOPMENT AND NUTRITIONAL CHARATERIZATION OF A HEAITHY CAKE PREMIX.

SELECTION AND PROCUREMENT OF INGREDIENT
Procurement of ingredients based on freshness, nutritional value and availability.

⬇

PREARATION OF PANEER
Preparation using standard coagulation method. Removal of whey, pressing, and cutting into uniform pieces.

⬇

DEHYDRATION OF PANEER
Using of HOT AIR OVEN at appropriate temperature 160°c. Time and Moisture loss monitoring.

⬇

DEHYDRATION OF APPLE, BEETROOT AND CARROT
Washing, peeling, slicing, blenching. Dehydration using OVEN Grinding to fine power for incorporation

⬇

STANDARDIZATION OF CAKE PREMIX
Trial with different proportions of flours Optimization for texture, taste, and appearance.

⬇

PREPARATION OF CAKE PREMIX
Measuring all flours and combined each flour with correct proposition

⬇

SENSORY EVALUTION
Product evaluated by semi-trained panel. 9 hedonic scale used for parameters

⬇

NUTRITIONAL ANALYSIS OF CAKE PREMIX

Nutritional analysis done for Milk, Paneer, (Apple, Beetroot, Carrot powder), Cake Premix and Cake. Chemical and Physical analysis were done.

COST CALCULATION

Cost calculation on ingredients price, packaging, overhead cost

PACKAGEING AND LABELLING

Package martial selection (moisture proof and food safe) Labelling with ingredients, Nutritional factors, shelf life, Usage instruction)

Paneer powder

Apple powder

Beetroot powder

Carrot powder

Three variation of cake premix was prepared by Apple, Beetroot, Carrot powder and Paneer powder, Wheat flour, Sugar, Milk powder. Each variation followed the same ingredient.

Variation 1

Variation 2

Variation 3

CHEMICAL INDICATORS AND EXTERNAL ATTRIBUTES

Nutritional analysis was done for cake premix powder. Analysis of milk Fat; Acidity of paneer; Lipids, Crude protein, Total dietary fiber, Fat, Protein, Carbohydrate, Energy of cake premix; Volume and Specific volume of cake; Physical and chemical composition were analyzed in NABL accredit lab GRG Food Quality Testing Laboratory and EFLT Quality Testing Laboratory. The other parameters were done in Food Science and Nutrition laboratory of our department.

CHEMICAL INDICATORS AND EXTERNAL ATTRIBUTES RESULT

ANALYSIS PRODUCT	CHEMICAL INDICATORS	RESULT OF CHEMICAL INDICATORS	EXTERNAL ATTRIBUTES	RESULT OF EXTERNAL ATTRIBUTES
Milk	Fat	0.5%	-	-
Paneer	Acidity Total solids	0.6% 17.9%	-	-
Apple, Beetroot, Carrot powder	-	-	Water Holding Capacity Moisture	8.757 5.86%
Cake Premix	Ash Lipids Total Dietary Fat Protein Carbohydrate Energy	24.9g 0.01 1.85g 1.58g 1.85g 12.5g 375.7kcal	Water Holding Capacity Moisture Swelling index Oil Holding Capacity Specific Gravity	400% 5.56% 5% 20% 0.8%
Cake	-	-	Weight Volume Specific Volume	5.56% 93% 1.73%

III CONCLUSION

This study, titled “A Study on the Development of a “DEVELOPMENT AND CHARACTERIZATON OF A HEALTHY CAKE PREMIX” was carried out with the aim of creating a nutritional rich cake premix.

The Apple, Beetroot, Carrot, and Paneer Cake Premix is a nutritious and flavorful blend of natural ingredients. Apple adds sweetness, fiber, and a light fruity aroma.

Beetroot contributes vibrant color, antioxidants, and a mild earthy flavor. Carrot provides moisture, beta-carotene, and a subtle sweetness. Paneer enriches the mix with protein and a soft, creamy texture. Together, these ingredients create a moist and balanced cake that appeals to both kids and adults.

The premix is a healthier alternative to traditional cake mixes, using whole foods instead of artificial additives. It is easy to prepare, making it convenient for home bakers.

This cake is ideal as a tea-time snack, for kids’ lunch boxes, or as a guilt-free dessert. To test the applicability of the flour, three variations were prepared using apple, beetroot, carrot, and paneer powder. These were then subjected to sensory evaluation by a panel of 50 semi-trained members.

These Cake premixes were assessed for attributes such as Appearance, Taste, Colour, Aroma, flavor, Texture, Mouthfeel and overall acceptability. Among the 3, the 2-variation stood out, receiving the highest scores for overall acceptability.

Based on this result, Variation 2 was selected as the final formulation for further culinary application, as it demonstrated not only favorable nutritional and functional qualities but also excellent taste and consumer appeal.

The premix contains 5.56 grams of moisture. It provides 12.5 grams of protein, contributing to the overall nutritional value. The total energy content is 375.7 kilocalories (about 30056 minutes of running). It also includes 1.85 grams of fat and an equal amount of dietary fiber. Additionally, the product contains 77.8 grams of carbohydrates and a very

small amount of lipids, 0.01 grams. The analysis procedure was followed by Fassi manual.

"A sensory analysis was carried out with 50 semi-trained panelists from the Department of Food Science and Nutrition. Among the three variations tested, Variation 2 received the highest sensory score. The evaluations were based on a 9-point hedonic scale."

IV REFERENCE

1. Ahmed, S. (2011). The role of fruits and vegetables in preventing chronic diseases. International Journal of Pharmaceutical Research (IJPR), 3(3), 27–35
2. Alam, M., Rawat, M., & others. (2024). Nutritional profile, quality standards, and growing consumer demand of paneer: A review. International Journal of Dairy Technology, 77(1), 45–53. https://doi.org/10.1111/1471-0307.13045
3. Boyer, J., & Liu, R. H. (2004). Apple phytochemicals and their health benefits. Nutrition Journal, 3, Article 5. https://doi.org/10.1186/1475-2891-3-5
4. Dhumal, N., & Kochewad, S. A. (n.d.). Nutritional composition and health benefits of paneer (Indian cottage cheese): A review. International Journal of Research and Analytical Reviews (IJRAR), 6(2), 802–808.
5. Gunadi, K., & Pamungkaningtyas, F. H. (2023). Effect of emulsifiers addition in sponge cake premix on the physical and sensory of sponge cake. IOP Conference Series: Earth and Environmental Science, 1169(1), 012103. https://doi.org/10.1088/1755 1315/1169/1/012103
6. Janick, J., Cummins, J. N., Brown, S. K., & Hemmat, M. (1996). Apples. In J. Janick & J. N. Moore (Eds.), Fruit breeding: Tree and tropical fruits (Vol. 1, pp. 1–77). New York: Wiley.
7. Kaur, H., & Gupta, T. (2020). Functional and therapeutic significance of fermented dairy products: A review. Journal of Pharmacognosy and Phytochemistry, 9(4), 1323 1329.
8. Kaur, H., & Gupta, T. (2020). Role of fermented dairy products in gastrointestinal health and disease prevention: A review. Journal of Pharmacognosy and Phytochemistry, 9(3), 1250–1257.
9. Kellerhals, M. (2009). Apple. In J. Prohens & F. Nuez (Eds.), Handbook of plant breeding: Temperate fruit crops (Vol. 4, pp. 1–37). Springer.
10. Khan, S. U., & Pal, M. A. (2011). Paneer – A popular traditional Indian dairy product. Asian Journal of Dairy and Food Research, 30(2), 91–98.
11. Khan, S. U., & Pal, M. A. (2011). Paneer production: A review. Journal of Food Science and Technology, 48(6), 645–660. https://doi.org/10.1007/s13197-010-0190-0 for
12. Kohajdová, Z., Karovičová, J., & Schmidt, Š. (2018). Beetroot powder as a functional ingredient bakery products. Chemical Papers, 72(2), 1217–1225. https://doi.org/10.1007/s11696-017-0323-5
13. Kumar, S., & Rai, D. C. (2014). Paneer – An Indian traditional dairy product: A review. Journal of Food Science and https://doi.org/10.1007/s13197-011-0589-0
14. Kumar, S., Rai, D. C., Niranjan, K., & Bhat, Z. F. (2014). Paneer—An Indian soft cheese variant: A review. Journal of Food Science and Technology, 51(5), 821–831. https://doi.org/10.1007/s13197-011-0477-4
15. Lavanya, A., & Arivuchudar, R. (2022). A review on paneer and its types. International Journal of Creative Research Thoughts (IJCRT), 10(2), 154–161.