Formulation And Standardization of Jowa Beet Instant Pancake Powder

Mahalakshmi[1], Dr. K. U. Pavithra Krishna[2]
[1]*Head of the Department, B. Sc., Food Science and Processing Management,*
[2]*Subbalakshmi Lakshmipathy College of Science, Madurai, Tamil Nadu, India*

Abstract- The study focuses on developing a nutritionally enriched pancake mix using jowar (sorghum) flour and beetroot extract. Jowar, a gluten-free ancient grain rich in fiber, protein, and antioxidants, was selected for its digestive and metabolic benefits. Beetroot (Beta vulgaris L.) was incorporated for its natural pigments, micronutrients, and health-promoting bioactive compounds. The objective was to formulate a functional, convenient, and health-oriented food product that supports digestion, aids in blood sugar control, and promotes overall wellness. The study involved ingredient procurement, product formulation, sensory evaluation, nutrient analysis, cost estimation, packaging, labeling, and shelf-life studies. Three variations of beetroot extract (5%, 10%, and 15%) were tested to identify the most acceptable formulation based on sensory attributes such as appearance, flavor, color, texture, and taste. The sensory evaluation revealed that the 10% beetroot-incorporated jowar pancake (PPEIWP2) achieved the highest overall acceptability among the variations. Nutrient analysis showed significant levels of protein (7.1 g), carbohydrates (67.51 g), energy (309.3 kcal), calcium (35 mg), and iron (3.26 mg), indicating its nutritional superiority. The product demonstrated a satisfactory shelf-life under standard storage conditions, and cost analysis revealed that it could be produced economically, with a total cost of ₹18 and a profit margin of ₹5 per unit. The findings highlight the potential of incorporating beetroot extract into traditional cereal-based products to enhance nutritional quality, color appeal, and consumer acceptance. The study concludes that beetroot-enriched jowar pancake powder is a viable, healthful, and cost-effective food innovation suitable for all age groups, particularly for those seeking gluten-free, nutrient-rich alternatives.

Keywords: Jowar pancake, Beetroot extract, Standardization, Nutrient analysis, Sensory evaluation, Gluten-free, Functional food, Dietary fiber, Antioxidants, Food formulation, Cost analysis, Shelf-life, Health-based product, Sorghum flour, Natural colorant.

I.INTRODUCTION

The pancake made with jowar flour and beetroot offers a nutrient and flavorful twist on traditional pancakes. Jowar pancake are a nutritious and delicious breakfast a snacks options made from jowar (Sorghum) flour. Jowar is a gluten-free grain rich in protein, fiber, and antioxidant, making it an excellent choice for those with dietary restrictions or preferences. Theses pancakes offer a unique blend of nutrition and flavor, making them an attractive option for health-conscious individuals. Jowar flour is an excellent alternative for those with gluten intolerance of sensitivity. Rich in dietary fiber, supporting digestive health and satiety. Red beetroot (Beta vulgaris L. ssp. Vulgar is) belongs to Chenopodiaceae family, which includes nearly 1,400 species and the members of di-cotyle (Paciulli et al., 2016). It origin is Mediterranean Region and it has been widely grown in the continents of Europe, America, and Asia recently due to the increase in its popularity (Chawla et al., 2016). Genetic variation, pigmentations. And environmental conditions have and effect on color intensity of red beetroot (Not Tingham, 2004). Regular shape and high soluble solids content are also the main factors to be considered in selecting red beetroot cultivars be sides yield and pest and disease resistance (Bara n'ski et al., 2001; Gaertner & Goldman, 2005). Besides color and size, red beetroots vary in shape from globular to tapered (Munro & small 1997). Red beetroot has been used for centuries due to nutritional and health benefits (Babarykin et al., 2019; Hamedi & Honarvar, 2018). It has been used in medicine since the Roman period (Ninfail & Angelino, 2013). Recently, the de a d for healthy food has also increased consumer interest in red beetroot (Clifford et al., 2015) and this has been reflected in various cuisines. As a matter of fact, apart from raw consumption, salads, soups, vegetable

dishes, roasting and olive oil dishes of red beetroot have become widespread in all cuisine (Akan et al., 2019). Additionally, in recent years, the pigments of red beetroot have also been used as a natural colorant for the food industry and additive in food product (Chhikara et al..2019; Slavov et al., 2013).

II. MATERIALS AND METHODS

2.1 Raw Materials

The raw materials such as jowar flour, Beetroot, egg, jaggary, banana, milk, vanilla essence, baking powder, beetroot extract from Department store in Virudhunager.

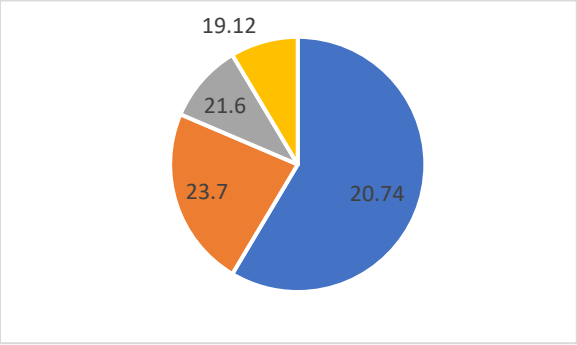
Nutrient	Total
Moisture	21.68
Protein	7.1
Fat	1.28
Carbohydrates	67.51
Energy	309.3
Calcium	35
Phosphorous	160.55
Iron	3.26
Carotene	30.55
Thiamine	0.25
Riboflavin	0.08
Niacin	2.08
Total B6	0.24
Folic acid	0.09
Vitamin C	1.05
Choline	36.30

2.2 Standardisation and formulation

Three formulations were developed:

- ABCM1: 5% Beetroot extract.
- ABCM2: 10% Beetroot extract.
- ABCM3: 15% Beetroot.

Sensory evaluation of the Sample



2.3 Sensory Evaluation

The samples were assessed on appearance, colour, flavour, texture, taste, and overall acceptability by a semi-trained panel of ten people using a five-point hedonic scale (1=Dislike extremely, 2=Dislike moderately, 3=neither like not dislike, 4=Like moderately, 5=Like extremely).

2.4 Nutrient Analysis

Nutrient analysis is this process of determining the nutritional content of food. It is a vital part of analytical chemistry that provides information about the chemical composition, processing, quality control and contamination of food.

Nutritional analysis is the process of calculation the nutritional content of food. The nutritional information calculated includes everything from calories to vitamins and minerals.

The development and evaluation of beetroot extract incorporated food products were subjected to nutrient analysis namely Energy, Protein, Carbohydrates, Calcium, and Magnesium. The procedures adopted for the nutrient analysis are appended in Appendix.

2.5 Cost Analysis

The cost of ingredients and packaging was used to determine the production cost per 100g.

III.RESULT

Sensory evaluation of the three formulations of beetroot pancake showed notable differences in acceptability. Sample C recorded the highest overall acceptability score of 4.4, followed by B (4.1) and sample A (4.0) on a five-point hedonic scale. Sample C also achieved higher scores for appearance

IV.CONCLUSION

The jowar pancake prepared using jowar flour, beetroot powder, and jaggery is a nutritious and healthy alternative to refined flour pancakes. Jowar flour provides dietary fibre and supports digestion, beetroot powder adds natural colour, antioxidants, and essential nutrients, while jaggery enhances taste and supplies minerals in a natural form. Overall, this pancake is wholesome, energy-giving, and suitable for a balanced diet.

REFERENCE

[1] Devender kumar, Nutritional and organoleptic attributes of novel pancake fortified with spirulina (Arthrospira platensis), International Journal of Applied Home Science, Volume 4 (9&10), pg.-785-789.
[2] Margherita Bruttomesso, Federico Bianchi, et al, Evaluation of the technological and compositional features of pancake fortified with Acheta domesticus, volume 199, pg, 100-200.Dislike
[3] Singh, R., & Soni, S.K. (2020). Extraction, characterization, and antioxidant properties of beetroot extract. Journal of Food science and Technology, 57(1), 109-116.
[4] Wang, Y., &Chen, Y. (2017). Incorporation of Bioactive Ingredients into pancakes: Effects on Nutritional Profile and Consumer Acceptance. Journal of Food Science, 82(6), 1400-1410.