



Standardization of multi-nutrient cake and its shelf life study

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Abstract:

A multi-nutrient dense magic cake was made which can be also considered as a mid day meal. Standardization of this high calorie , high protein cake along with shelf life study was done. Sensory evaluation using 5 point scoring test was done with a naive panel (10 member). Score card consisted of characteristic such as appearance, flavour, texture, taste and over all acceptability . This recipe was well accepted by the consumer which gives high calorie, high protein, calcium, iron, vitamin A and B complex etc. Packaging, marketing, budgeting and nutrient labeling were the other aspects done in this study.

(Key words : Multi-nutrient, Cake, Mid-day meal)

Introduction:

Multi-nutrient food product was developed in undergraduate studies as a part of food product development. Child malnutrition is a major Global health problem leading to morbidity and mortality, impaired intellectual development and working capacity, and increased risk of adult diseases.(1) Multi nutritious product is beneficial for all age groups and it might help in malnutrition as well and it can also be served as a mid day meal. This magic cake is prepared with brown rice, rajma, Sweet potato, carrot, eggs and milk. Kidney beans (Rajma) have become famous all over the world due to its health benefits as well as thier savory texture.(2) Kidney beans are rich in protein, B complex vitamin, iron, magnesium, Phosphorus, zinc and fibre. Brown rice contains many type of phenolic acids which are well known for their antioxidant activities and one of the most common antioxidants in our diet.(3)Brown rice Is rich in protein, minerals, vitamins And fibres as well. As brown rice has antioxidant property and highly nutritious value that's why It was used in the product. This product is multi-nutrient as well as gluten free.

Objectives:

- To innovate a cost-effective multi-nutrient food product.
- To study the standardization and shelf life of the products
- To select a food packaging material
- To design a nutritional label
- To learn about budgeting and marketing aspects
- To prepare a gluten free product.

Methodology:

After researching about various ingredients which can help to reduce malnutrition in children and beneficial for all age groups, brown rice, rajma, carrot, Sweet potato and eggs were concluded as the basic ingredients for an innovative food product development. The product prepared using these ingredients was named as a 'Magic Cake' which had high nutritional value for e.g. kcal, protein, vitamin A, B complex, iron, act. This product was sensory evaluated by naive panel members (10) using a 5 point scoring test.

Standardization:

TABLE.1.1

Ingredients	Amount (gm/ml)
Brown rice	150
Rajma	150
Sweet potato	150
Carrot	150
Eggs	3
Milk	150
Sugar	150
Vanilla essence	8-12 drops
Cinnamon	5
Oil	100

Recipe:

1. Rajma and brown rice roasted and grinded to convert it into flour. Three eggs were beaten till it foams and milk and oil was added.
2. Grated sweet potato and carrot mixed in the egg bowl.
3. Sieve dry flour sugar least amount of baking powder into the same bowl.
4. Prepare consistent batter by beating the mixture well.
5. Bake it in preheated cooker for 25 minutes.

6. Pumpkin seeds were used as garnishing agent. Cinnamon powder and vanilla essence were used for flavor.
7. One loaf of cake divided into eight pieces.

Sensory evaluation:

Sensory evaluation was done to check the acceptability of the product. Five point scoring test was used and score card were prepared accordingly. The scores are shown below.

TABLE.1.2

Qualities	Scores
Appearance	4.6
Flavor	4.4
Texture	4.4
Taste	4.8
Overall acceptability	5

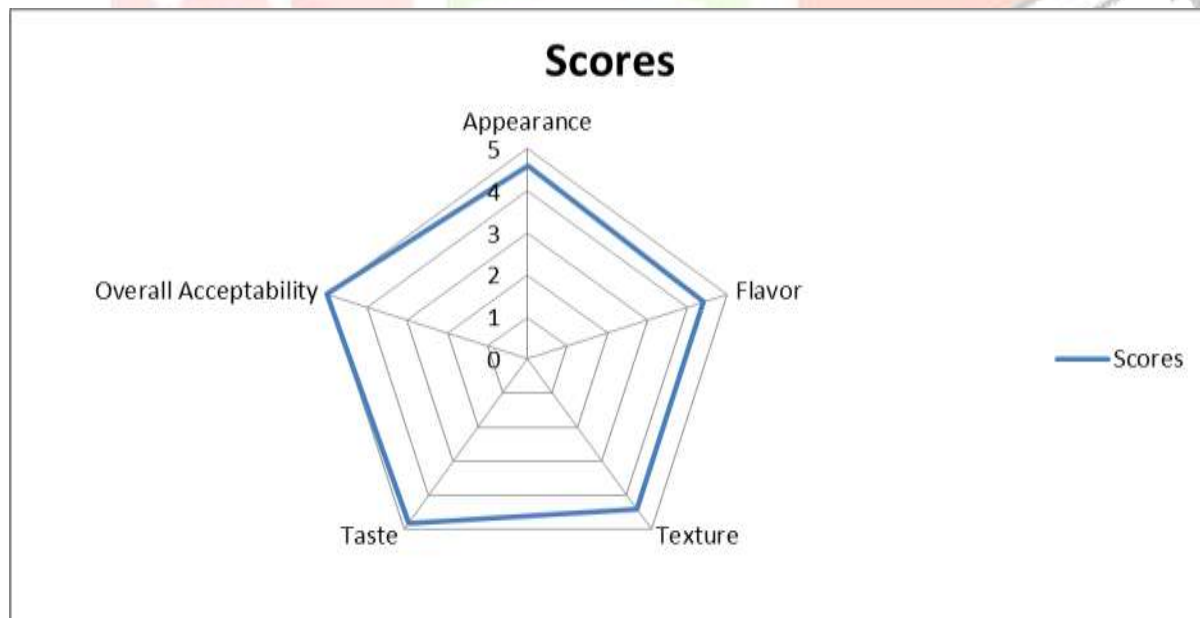


FIG.1.1

Packaging:

Food packaging is defined as enclosing food to protect it from tampering or contamination from physical, chemical, and biological sources, with active packaging being the most common packaging system used for

preserving food products.(4) Packaging of the food product is the most important aspect of food processing for its shelf life, hygiene and Safety. Box was used to pack the piece of cake. The piece of cake first wrapped in a parchment paper. Parchment paper is great and moisture resistant paper specially treated for oven use. Parchment paper is treated with silicon, so it is non-stick, heat proof and grease resistant. Because of these qualities it was used to preserve and prevent moisture loss. All pieces of cake were packed and nutrition labelling was done.

Nutrition labelling:

According to the amount of product, the nutritional value was calculated and mentioned in a nutritional table format. Nutritional values like energy protein calcium iron vitamin A were mentioned. The nature of products like contains egg, gluten free, storage conditions, amount of a product, price were printed. Non-veg mark was also printed. The products name was SSK's Magic cake and tagline of the brand was nutrients in every bite.

NET WEIGHT - 120 g	<p style="text-align: center;">SSK'S MAGIC CAKE</p> <p style="text-align: center;">NUTRIENTS LABE</p> <p style="text-align: center;">FACTS - GLUTEN FREE. CONTAINS EGG. </p> <table border="1"> <thead> <tr> <th>NUTRIENTS</th> <th>CONTENT FOR PACKET</th> </tr> </thead> <tbody> <tr> <td>ENERGY</td> <td>408 k cal</td> </tr> <tr> <td>PROTEIN</td> <td>9 g</td> </tr> <tr> <td>CALCIUM</td> <td>72.4 mg</td> </tr> <tr> <td>IRON</td> <td>2 mg</td> </tr> <tr> <td>β CAROTENOIDS</td> <td>12243 mcg</td> </tr> <tr> <td>FAT</td> <td>12 g</td> </tr> </tbody> </table>	NUTRIENTS	CONTENT FOR PACKET	ENERGY	408 k cal	PROTEIN	9 g	CALCIUM	72.4 mg	IRON	2 mg	β CAROTENOIDS	12243 mcg	FAT	12 g
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MANUFACTURING DATE - JAN 25, 2020															
BEST BEFORE 10 DYS															
STORE IN AIR TIGHT CONTINER															
MRP - 40/-															
CONTACT NO - +91 8879346829															
EMAIL - katalarkshreya2@gmail.com															

Budgeting:

To decide the cost of the product aspects were taken and considered toto as proper cost of the packet. From the total cost of Expenditure cost for one product was calculated. Batch of eight pieces were prepared according to that cost was calculated.

TABLE.1.3

Expenditure	Price for 8 pieces
RAW ingredients	180 rs
Packaging	40 rs
Labelling	30 rs
Travelling	10 rs
Electricity cost/ Labour/ Rent/ Gas	20 rs
Miscellaneous	20 rs

The cost for eight pieces was 320 rupees. So the one packet costs came to 40 rupees.

100 pieces = 4000 rupees

1000 pieces = 400000 rupees

Marketing:

Marketing is one of the most important aspects for the sale of the product. The product was prepared in the bulk and sold in the college premises. The food exhibition started in the morning and at the end of the afternoon product were sold.

Shelf life study:

Period a continuous sensory evaluation was done to check the shelf life with different names panel members. The same score card use which consists of appearance liver texture test and overall acceptability and the scores were as follows: 1=poor 2=fair 3=good 4=very good and 5=excellent. After the evaluation it is concluded that the cake was accepted throughout evaluation of 3 weeks. In the first week it was written excellent and in second and third week it was treated as very good. The texture had gone down till 3rd week because of motion loss it became crumbly.

TABLE.1.4

Qualities	28/1	3/2	8/2
Appearance	4.6	3.6	3.1
Flavour	4.4	3	3.6
Texture	4.4	2.8	2.9
Test	4.8	3.2	4.1
Acceptability	5	4	4

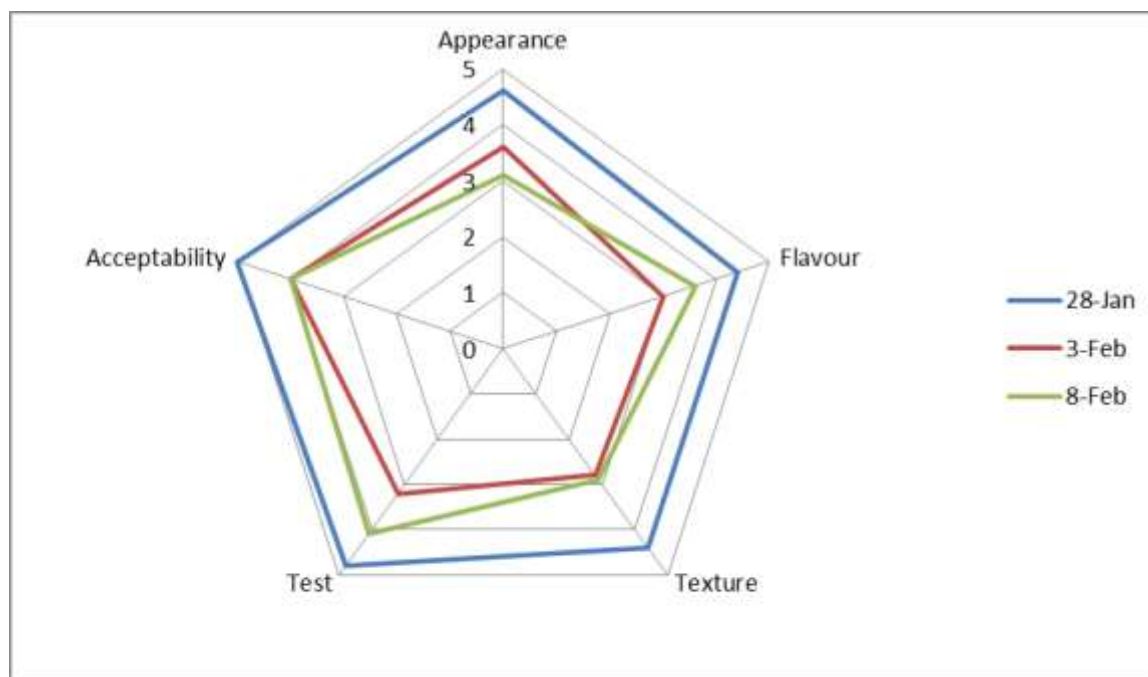


FIG.1.2

Conclusion:

'Magic cake' a multinutrient gluten free cake developed which can be given as a mid day meal which was highly accepted. Magic cake is high in calories, protein, vitamin A, B complex, Calcium, Iron and etc. The acceptance and shelf life were checked by sensory evaluation. Highly accepted by naïve panel members and has shelf life of 3 weeks under refrigeration.

Variations in this product can be made with different pulses, different flavours and eggless as well.

Reference -

1. Kim F. Michaelsen (et. al) (2009) Food and Nutrition Bulletin (Suppliment) The United Nations University, Choice of foods and ingredients for moderately malnourished children 6 months to 5 years of age, Vol.30, no.3
2. Kshitij Parmar (et. al) (December 2016) RASHTRIYA KRISHI, Farming of kidney beans (Rajma) and its health benefits, Volume 11, Issue 2
3. Keneswary Ravichanthiran (et. al) (2018 June) Antioxidants (Basel), Phytochemical Profile of Brown Rice and Its Nutrigenomic Implications, 7(6):71
4. Gases in Agro-Food Processes, 2019 Food packaging