



SENSORY AND NUTRITIONAL FORMULATION OF KHAJUR ROLLS DEVELOPED FROM GALACTAGOGUE & IMMUNE BOOSTING INGREDIENTS

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Abstract: Globally, anemia affects 1.62 billion people. However, the population group with the greatest number of individuals affected are non-pregnant women and adolescents. Also, the prevalence of anemia in hospitalized patients with COVID-19 is high, and it is associated with poor outcomes of COVID-19. Thus, a product was developed from galactagogue & immune boosting ingredients like dates, cashews, cardamom powder, walnuts, guar gum, Almonds, black raisins, Poppy seeds, ragi flour, dry ginger, desiccated coconut & sunflower seeds which has nutrients like iron, calcium, omega-3 fatty acids, antioxidants, fiber etc. which will improve the iron content of the diet as well as will help in fighting infections. Shelf-life study was done for the product which included sensory evaluation by scoring test on characteristics such as taste, appearance, texture, flavor, after effect. The other aspects covered in the study were budgeting, packaging, Nutritional labelling, marketing etc.

Index Terms – Anemia, Covid-19, Immune boosting, Galactagogue

I. INTRODUCTION

Khajur rolls is a product which provides good number of calories and satiety value. This product is targeted especially for population affected with anemia in hospitalized patients with Covid-19. Therefore, one serving of this product provides good amounts of calories, iron, calcium, protein & many other nutrients required to overcome anemia or any other infections.

Khajur rolls is made up of different flours and a functional food ingredient 'Dink' which is also a galactagogue which is given to lactating women which helps in increasing the breast milk production. It also contains nuts, sesame seeds & ginger which again helps in increasing breast milk production.

Poppy seeds are good sources of omega-6. The seeds are rich in minerals (Na, K, Ca, Mg) and have more than 20% protein content.

Dates contain anthocyanins, phenolics, sterols, carotenoids, procyanidins and flavonoids, compounds known to possess multiple beneficial effects. possess free radical scavenging, antioxidant, antimutagenic, antimicrobial, anti-inflammatory, gastroprotective, hepatoprotective, nephroprotective, anticancer, antiulcer and immunostimulant activities. Dates contain vitamin C and fiber, which increase iron absorption.^[1]

Sunflower seeds are especially high in vitamin E and selenium. These function as antioxidants to protect our body's cells against free radical damage, which plays a role in several chronic diseases. They may help lower blood pressure, cholesterol and blood sugar as they contain vitamin E, magnesium & protein. ^[3]

Sesame seeds protect against heart disease, diabetes, and arthritis.^[4]

Nuts may have a beneficial effect on our gut microbiota by supporting the growth of beneficial gut bacteria. It also reduces total cholesterol and "bad" LDL cholesterol while increasing "good" HDL cholesterol levels.^[2]

Thus, the present study was designed to formulate a product to target anemic women with the following objectives -

- 1) To standardize an innovative nutritious product which is cost effective and has good consumer acceptability.
- 2) To study the shelf life of the product.
- 3) To design a nutrition label.
- 4) To identify a cost-effective Packaging material.
- 5) To understand about the marketing & budgeting aspects of the product.

II. METHODOLOGY-

Based on sensory evaluation scores “khajur rolls” was finalized as final product. The sensory evaluation was done using scoring method on both the trials on 6 naive panel members. The scorecard consists of 7-point hedonic scale ranging from like extremely to dislike extremely. Attributes that were scored were appearance, aroma, color, texture, taste, aftertaste.

III. MATERIALS-

Materials used to prepare this product (ingredients) are dates, cashews, cardamom powder, walnuts, guar gum, Almonds, black raisins, Poppy seeds, ragi flour, dry ginger, sesame seeds desiccated coconut & sunflower seeds.

Table.1 trial.1

INGREDIENTS	AMOUNT
Dates	50g
Cashews	10g
Walnuts	10g
Guar gum	5g
Almonds	20g
Black raisins	20g
Poppy seeds	5g
Sesame seeds	5g
Ragi flour	10g
Dry ginger powder	10g
Desiccated coconut	10g
Sunflower seeds	5g
Cardamom powder	5g
Ghee	25g

As can be observed from trial 1.1 that taste of dry ginger powder overpowered the sweet taste of the rolls. So, to improve its taste it was standardized again for the second time done and it turned out to be better than first.

Table.2 trial.2

INGREDIENTS	AMOUNT
Dates	50g
Cashews	10g
Walnuts	15g
Guar gum	10g
Almonds	15g
Black raisins	15g
Poppy seeds	5g
Sesame seeds	10g
Ragi flour	20g
Dry ginger powder	5g
Desiccated coconut	10g
Sunflower seeds	5g
Cardamom powder	5g
Ghee	25g

IV. METHOD OF PREPARATION-

- Sauté almonds, cashews, walnuts, sunflower seeds, sesame seeds separately in a pan using small quantity of ghee & make a fine powder of it.
- Add small amount of ghee & fry guar gum & make a fine powder using mixture.
- Now add ragi flour & fry it with ghee. Then add black raisins & roast it with ghee.
- Fry seedless dates in small quantity of ghee.
- Now add all these ingredients & mix it, add dry ginger & cardamom powder, make a dough & make small rolls of it.
- Coat it with poppy seeds & desiccated coconut. Healthy rolls are ready to be served.

V. RESULT OF SENSORY EVALUATION OF 1ST & 2ND TRIAL-

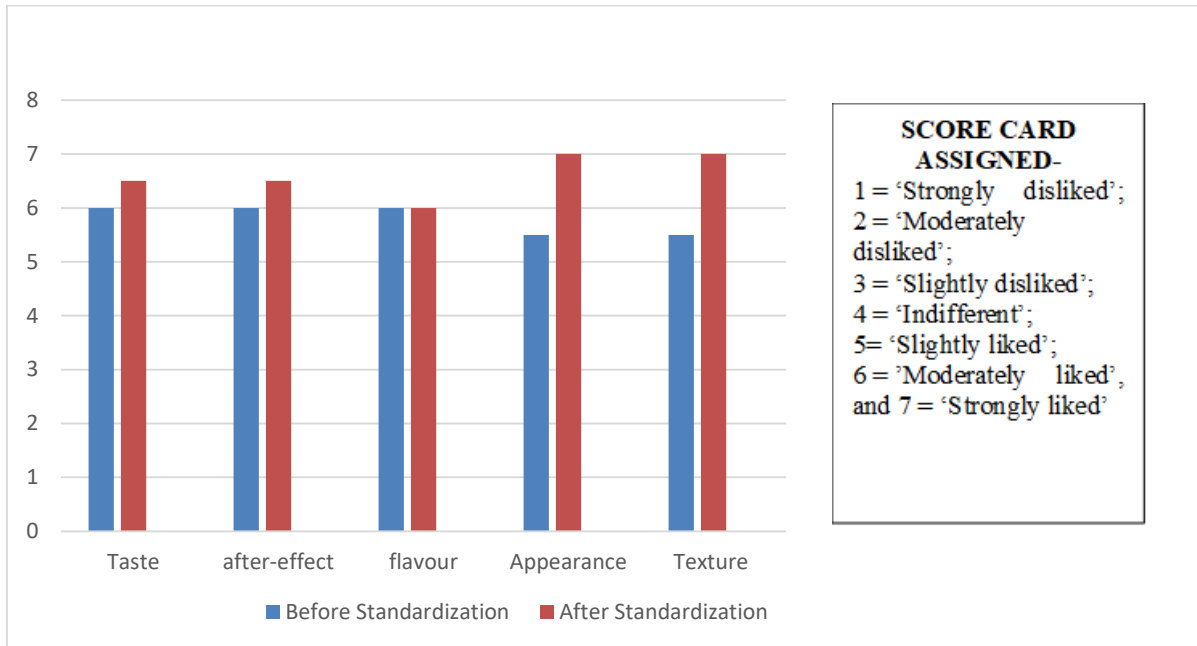


Fig: 1 result of sensory evaluation of 1st & 2nd trial

RATING CHARACTERISTICS-

Sensory evaluation was carried out by 6 untrained panelists. It was done by scoring method. A seven-point scale was used on characteristics of taste, texture, flavor, after effect and appearance. Result was thus noted down after the sensory evaluation. Before standardization and after standardization had some changes in terms of flavor, texture, appearance & after effect. Sensory evaluation helped us to finalize the product before selling.

VI. RESULT OF SENSORY EVALUATION OF KHAJUR ROLLS FOR 4 WEEKS-

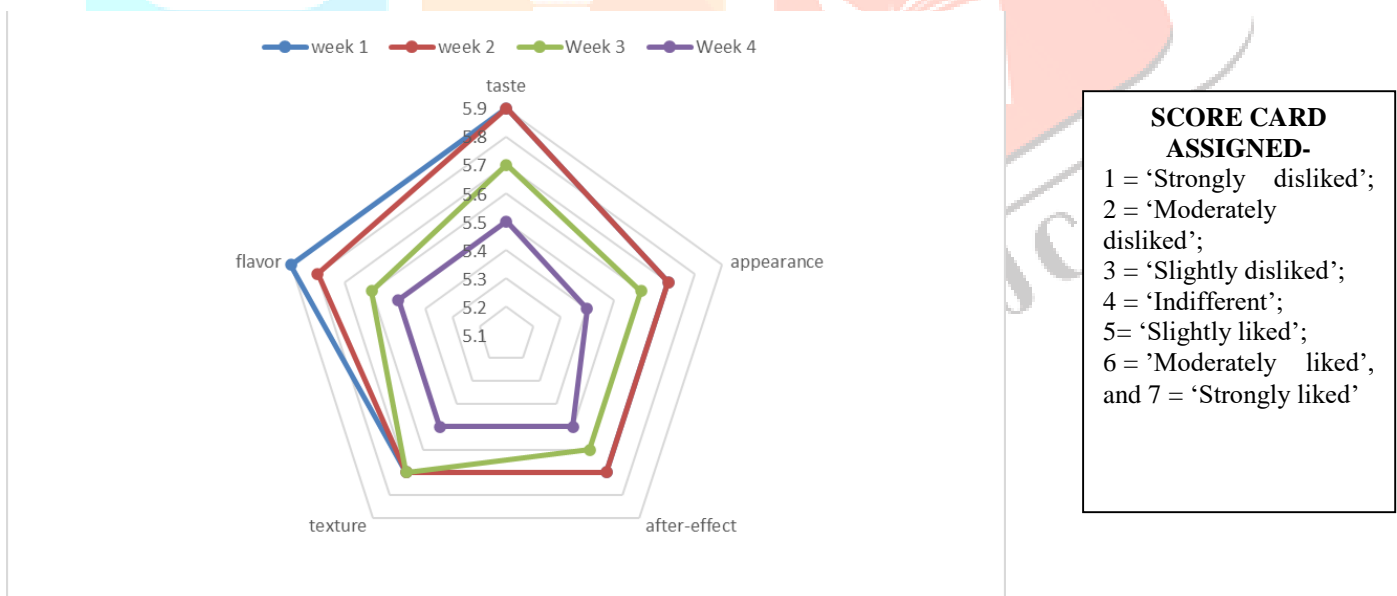


Fig: 2 Sensory evaluation of khajur rolls done periodically for 4 weeks

RATING CHARACTERISTICS-

During the 1st week the characteristics were rated good. The product had good taste, flavor, color, after effect and appearance. During 2nd week not many changes were noted. On 3rd week there was a slight reduction in the rate of characteristics. The feedbacks of the panelists were that though there were few changes in the product, they still liked it. Later on, by the end of the 4th week few changes were noted in taste, flavor, appearance, texture and after effect. The product started appearing slightly sticky, developed little off flavor.

VII. NUTRITIONAL LABEL-

It is an important marketing tool for the product. And informs the costumer the details of nutrients which he can have or not accordingly. Label consists of ingredients of the product, nutritional facts, whether veg or non-veg, price, manufacturing date, expiry date, net weight, any special recommendations, etc. It should also be eye catching and attractive to improve sales.^[6]

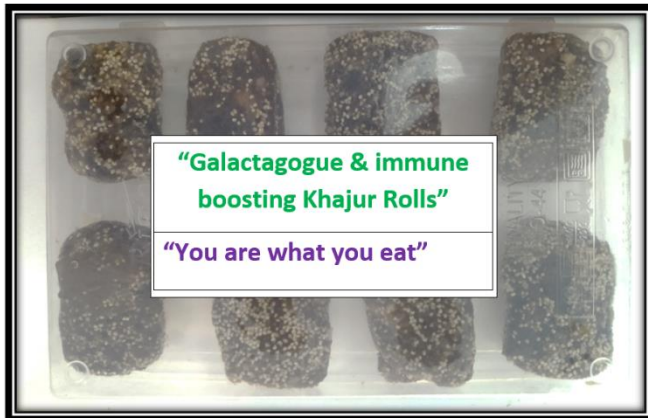


Figure 3

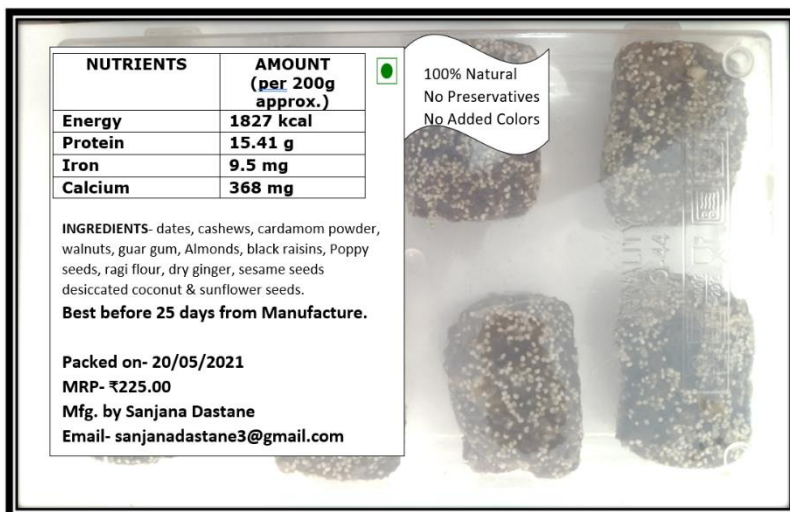


Figure 4

VIII. PACKAGING MATERIAL-

Packaging minimizes the damage to the product that can be physical, chemical or microbial.^[5]



Figure 5

The packaging material used here is Plastic Tintom Box. It is a hard, opaque plastic that is lightweight but also strong.

Features

- Seamless finish
- Lightweight
- Easy to carry

IX. BUDGETING-

Budgeting is an important aspect to be considered in product development. It should be cost effective so that all income groups can afford it. For bulk production food items were brought from wholesale market to reduce the cost.^[7]

Table.3

MATERIALS	AMOUNT
Raw ingredients	Rs.190
Plastic box	Rs.10
Nutritional label	Rs.5
Miscellaneous (Electricity, cooking gas, Maintenance)	Rs.20
TOTAL	Rs.225

Total cost of 1 box of khajur rolls was Rs. 225/-. If 50 boxes were to be sold, then the total gain would be Rs. 11,250/- out of which the profit would be Rs. 2,500/-. Since, the ingredients were bought at wholesale prices, the profit was more.

X. MARKETING-

The product was marketed through social media. Target group was chosen, it was the age group of 20-40 years. This group was targeted so as to create awareness of the nutrient rich product and its good effects on individual. This group is generally health conscious and so it was easy to sell the product in the market.

XI. CONCLUSION-

Khajur rolls is a product providing variety of nutrients like fibre, calcium, vitamins, iron, minerals, etc., and can be recommended for age group of 20-40, as a galactagogue for lactating women, anaemic women.

XII. REFERENCE-

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