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## AN AWARENESS STUDY ON GALACTOGENIC FOODS AND DEVELOPMENT OF ITS PRODUCT

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A holistic dietary, herbal and healthy resource for pregnant and post-partum women is based on the food and herbs that are used traditionally. Galactogouges are those foods or herbs that help in the production of Milk in lactating mothers. The product developed was nutritionally rich Ladoo made with varied kind of lactogenic food such as Fenugreek seeds, Aniseeds, Dink, Almonds, Cashew nuts, Fox nut seeds (Phool Makhana) and Ghee. The product provides good amount of Protein, calcium, Vitamins, Minerals, Functional property and has a good satiety value. Microbial analysis was carried out its Shelf life studies, Sensory evaluation, using a five scale point was performed considering the sensory attributes like Color, Taste, Texture, Aroma and Overall acceptability of the product. The other aspects covered in the study were packaging material, budgeting and the awareness was created among lactating nursing mothers. Trial supplementations were also provided to the subjects of the study.

**Keywords:** Galactogouges, Ladoo, Sensory evaluation, Packaging, Budgeting

### INTRODUCTION

Lactogouges or galactogouges are those foods or herbs that help in production of milk in women or increase the supply of breast milk in lactating mothers by increasing Prolactin secretion which in turn increases milk production. In India the concept of using lactogenic food are clearly dealt under Ayurveda and Unani Indian Traditional Medicines (Kulsum Jah *et al.*, 2012).

Women in different cultures are given certain foods right after child birth which have lactogenic property and are full of Vitamins and Minerals and other chemical properties that aid in the production of Breast milk. Nursing mothers eat Almonds or drink almond milk to increase the creaminess, sweetness and the amount of breast milk (Humphrey *et al.*, 2003).

The objectives of the study is to standardize an innovative nutritious product using different

galactogouges, to study the shelf life of the product using sensory evaluation, to make cost effective nutritious product by better budgeting, to select a packaging material and to create awareness among lactating mothers.

Gargonnut or fox nut seeds or phool makhana is a popped lotus seeds with multiple health benefits. *Euryale ferox* is the only species of the genus. These seeds are sold in market and used as a Furnaceous food. It is reported that *E. ferox* to be a good stimulant. Feeding of *E. ferox* stimulated hummoral and suggested its application in mothers after delivery. It is also utilize to overcome postnatal weakness in women, impotence in men, premature ejaculation other treatment includes diseases related to respiratory, circulatory, digestive, excretory are reproductive systems (Shankar *et al.*, 2012).

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Fenugreek [*Trigonella foenum-graceum*] popularly known as “Methi”. It is widely used as a condiment, a dye and it is also used as a lactogouges in medicine. It has been observed to enhance the lactation within 24-72 hours after taking fenugreek (Vinay Kumar *et al.*, 2012).

*Foeniculum vulgare* mill is commonly called as “sounf”, it has been used in traditional medicines for wide range of ailments related to respiratory, reproductive, digestive and endocrine. Additionally it is used as a galactogouges agent for nursing mothers (Shamkant *et al.*, 2014).

Phool makhana is made up of different galactogouges and the functional food ingredient “Dink” which also serves as galactogouges and helps in the production and supply of breast milk. Fox nut seeds fairly rich in Essential Amino Acids [EAAI] and Chemical Score [CS]. Of makhana are close to that of Fish. The EAAI of raw makhana or popped Makhana are 93% and 89% which are higher than the values of rice (83%), wheat (65%), Bengal gram (81.5%), cow’s milk (88.8%), Fish (89.2%) and Mutton (87.24%). Makhana protein (10-12%) is a bit lower than cereal protein but it is nutritionally superior to many plant and animal based diets due to high EAAI and CS (Mamta Shankar *et al.*, 2012).

Almonds are a rich source of Vitamin E, Protein, B-Vitamins and 12% Dietary Fiber and it also contains phytosterol associated with cholesterol lowering properties. Cashew nut is the good source of Antioxidants, Selenium, Copper, Iron and Zinc.

## MATERIALS AND METHODS

Ladoo was developed keeping in mind importance of Lactogouges during lactation period. It consist of fox nut seeds, fenugreek seeds, Fennel seeds, functional food “Dink” which serves as a galactogouges, dry coconut, almonds, cashew nut as a source of calcium, magnesium, Iron, Selenium, ghee for binding and providing satiety value.

### Sample Size and Selection of Subjects

The sample consist of a total of 50 subjects .The sample included the lactating mothers of age group 18-25 years. The people belonged to different places with different levels of education. Among selected sample (50), 92% were housewives while 8% were working women. The Developed product was distributed free of cost among these women to create awareness.

### Procurement of Raw Material

The raw material such as phool makhana, fenugreek seeds,

fennel seeds, dry coconut, Dink, almonds, cashew nuts, Bengal gram flour, sugar, ghee and cardamom powder were procured from local market. Table 1 show that the amount of ingredients used for preparation.

### Method of Preparation

Phool makhana or fox nut ladoo for variation-1 was made with sucrolose [artificial sweetener] available as sugar free. After evaluating, it was found that the sweetness of the product was not up to the mark and the ladoo was dry and not palatable. Further, the variation-2 product was made with adequate amount of table sugar and ghee in it but the product become quite sticky and after evaluating, it was observed that ghee was in additional amount.

**Table 1: Formulation of Ladoos**

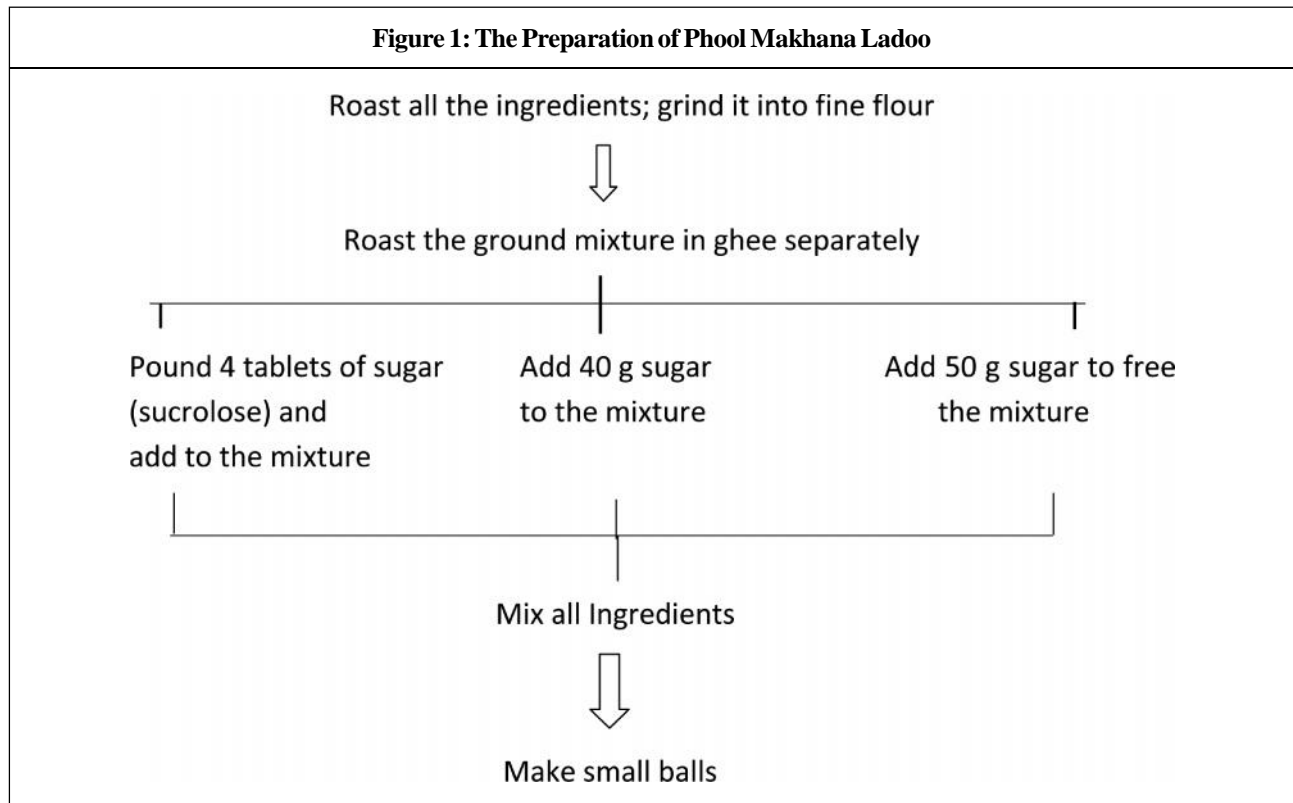
Ingredients	Basic	Variation – 1	Variation - 2
Bengal gram flour (g)	50	20	20
Phool makhana powder (g)	-	20	20
Fennel seeds powder (g)	-	10	10
Fenugreek powder (g)	-	2.5	2.5
Dink (g)	10	10	10
Dry coconut (g)	-	10	-
Almonds(g)	5	5	5
Cashew nuts(g)	5	5	5
Artificial sweeteners	-	4 tablets	-
Sugar (g)	50	-	30
Ghee (g)	30	30	40
Cardamom powder (g)	5	5	5

### Sensory Evaluation of Standardized Recipe

Scoring test was done with the help of panelist attributes to be considered were color, texture, taste, aroma and overall acceptability which were scored on a scale of 5.

where,

**Figure 1: The Preparation of Phool Makhana Ladoo**



5 – Excellent, 4 – Very Good, 3 – Good, 2 – Fair, 1 – Poor.

### Nutrient Analysis

Nutrient Analysis such as energy, protein, fat, carbohydrates calcium and Iron were determined using AOAC method.

### Packaging Material

Polypropylene is used for packaging the product. It is a thermo plastic polymer and has wide variety of industrial application such as textiles, stationery, reusable containers, labeling etc.

### Budgeting

It is an important aspect to gain financial success and profit. It makes it convenience for the people of all income groups to take conscious decisions about allocation of money. For bulk production, all the food ingredients were bought from wholesale market to minimize the expenditure.

### Awareness Study

The study on awareness of Lactogouges was done by distributing developed product free of cost among lactating mothers at an Anganwadi centre -2 located at Falaknuma, Hyderabad. Awareness was created by counseling and

explaining the importance of galactogouges and its role during Lactation.

### Shelf Life Studies

To study the shelf life of phool makhana ladoo, sensory evaluation was conducted every week which was done by seven trained panelists. Scoring test was done, attributes to be considered were color, taste, texture, and aroma and scored out of 5.

where,

5 – Excellent, 4 – Very Good, 3 – Good, 2 – Fair, 1 – Poor.

### Microbial Testing for Shelf Life Study

Microbial testing was done in the second week as the food is subjected to many changes over its life span, pour plating method was used for microbial testing, phool makhana ladoo was diluted twice and mixed with liquefied nutrient agar in such a way that colonies formed on the plate are countable.

## RESULTS AND DI SCUSSION

### Development of Phool Makhana Ladoo

After assessing the drawbacks of the product, the final product was made by adding phool makhana powder, sugar,

ghee in adequate amounts; Dink is added as per the need along with the other ingredients and thus the product was standardized. Flour sugar ratio is approximately 6:10.

From the results, it is inferred that the rating was highest for Taste, followed by Color, Texture, Aroma and Overall Acceptability. After the organoleptic evaluation results, the product was thus finalized to continue the shelf life studies.

### Nutrient Analysis

Table 2 shows the Nutrient analysis of some selected nutrients of importance. About 143 g of laddoo (6 No.s) were determined for their compositions of Energy, Protein, Carbohydrate, Fat, Iron and Calcium.

### Packaging Material

The main purpose of using this packaging material is because it is cost- effective and resistant to many sources of contamination such as Sunlight, Air and Relative Humidity. It is normally tough and flexible, often opaque.

### Budgeting

Packaging material is also bought in bulk to minimize expenses.

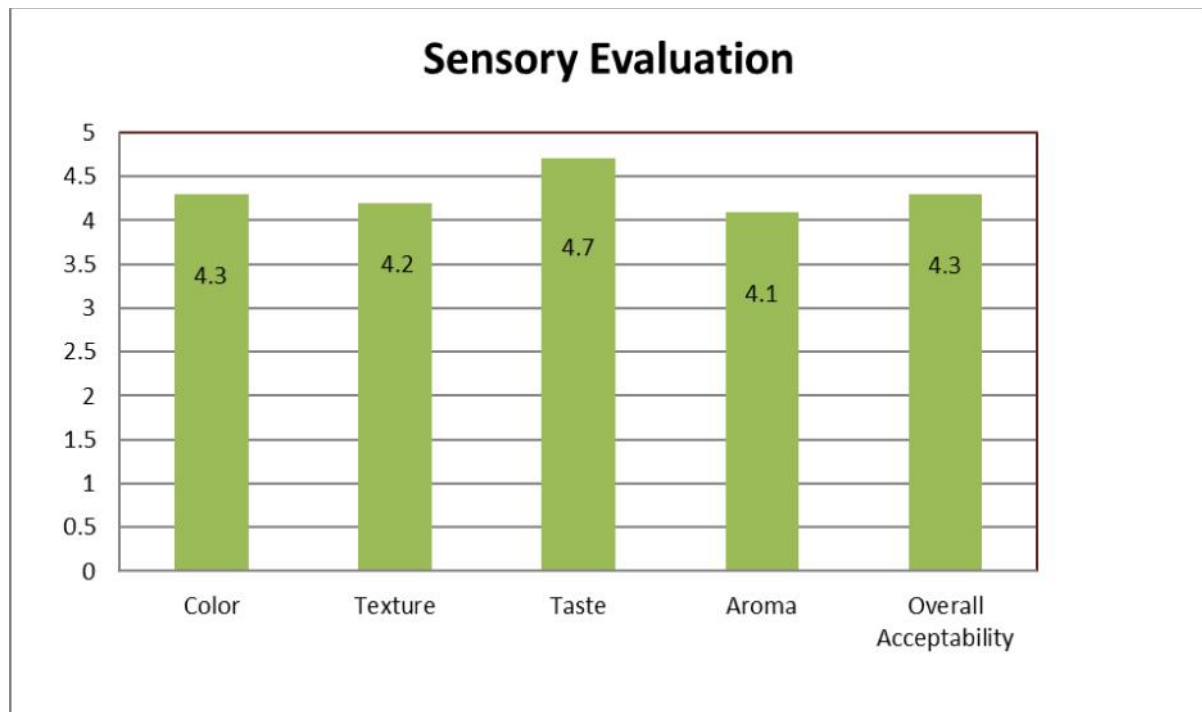
Total 55 packets were made out of which 50 packets were distributed for free of cost at anganwadi centre among lactating mothers and they were informed about the importance of lactogouges during lactation through the usage of different nutritional aids like posters etc. the remaining 5 packets were kept for sensory evaluation and microbial analysis of multigrain laddoo.

It can be observed that taste remained almost constant throughout the time period of 4 weeks; slight changes were noticed in texture and aroma which declined with time.

**Table 2: Nutrient Content of Phool Makhana Laddoo**

Nutrient	Amount
Energy	747 Kcal
Protein	15 g
Carbohydrate	95 g
Fat	38 g
Iron	18.5 mg
Calcium	90.18 mg

**Figure 1: Sensory Evaluation of Multigrain Laddoo**



**Plate 1: Phool Makhana Ladoo**



Overall the product remained good which is assumed to be due to good packaging material.

**Table 3: Shows the Cost Calculations for Ingredients Used for Phool Makhana Ladoo**

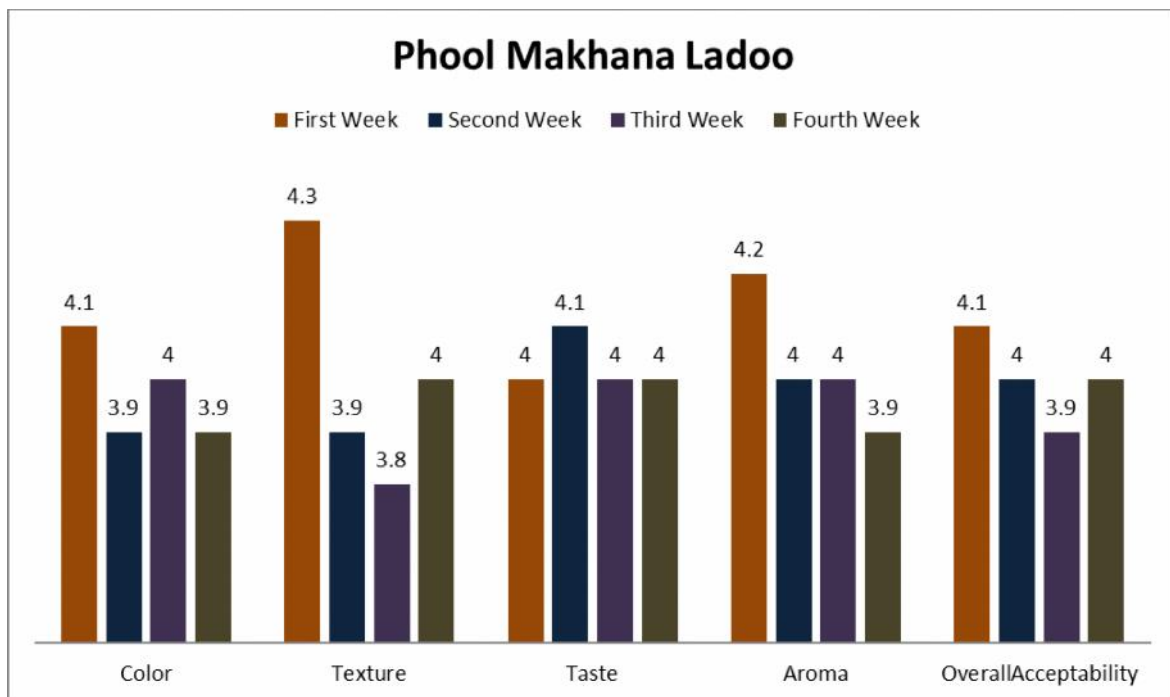
Ingredients	Wholesale Price (Rs.)
Phool makhana	100
Bengalgram flour	40
Fenugreek seeds	10
Fennel seeds	30
Dink	10
Almonds	30
Cashew nuts	30
Cardamom powder	10
Sugar	22
Ghee	150
Packaging material	100
Gas	100
Electricity	50
Labour	100
<b>Total</b>	<b>782</b>

**Plate 2: Polypropylene Packed Phool Makhana Ladoo**



This article can be downloaded from <http://www.ijfans.com/currentissue.php>

**Figure 2: Sensory Evaluation of Phool Makhana Ladoo for 4 Weeks After Bulk Production**



**Microbial Testing for Shelf Life Study**

Microbial testing was done to study the shelf life of Phool makhana Ladoo in the third week using pour plate method.

**Figure 3a: Shows the Flask with Nutrient Agar After Incubation**



**Figure 3b: Shows Authorress Carrying Out Microbial Analysis in Laminar Airflow**



**Figures 3c and 3d: Shows Colonies Over the Petri Plate After Pouring, Streaking and Incubating**



The above pictures shows the microbial tests which were carried out in the laboratory of Anwarul Uloom PG College, Mallepally, Hyderabad, Telangana, India.

#### CONCLUSION

Phool makhana laddoo is a product providing appreciable amounts of nutrients which are recommended for nursing mothers during lactation period. From the findings of the present study, it was concluded that the product which was developed by using different Galactogouges, if incorporated

in the diets of lactating women, their health status can be improved and milk production can also be enhanced. The product has a shelf life of 15 days; this was concluded from the results of microbial analysis which proved it safe for consumption.

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