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## STUDY ON THE FORMULATION OF LACTACUKI

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**Abstract:** Lactacuki was formulated for breastfeeding mothers due to its nutritional benefits. It is rich in ingredients that contains essential nutrient required for lactating mothers and also can serve as a galactagogue. There are many varieties of recipes for lactating mothers but the main ingredients used in the making of lactacuki are whole wheat flour, sathu powder, oat flour, shatavari powder, flax seeds powder, sesame seeds. The product was finalized after the third trial using sensory evaluation method. Shelf-life study was conducted for 4 weeks and it was evaluated after every one week on characteristics like Shape, Mouthfeel, Taste, Color, Texture, Overall acceptability. Additionally, nutrition label was designed, packaging material was selected, and budgeting was done. Marketing was carried out using digital platform and selling through known contacts was also done.

**Index Terms - Lactacuki, shatavari powder, galactagogue.**

### I. INTRODUCTION

Lactation is a process of synthesizing milk which is secreted from the mammary glands of the postpartum female breast in response to an infant sucking at the nipple. Human milk is the first dietary exposure in infancy and the best nutritional option for growth and healthy development of the newborn and infant as it is safe, clean and contains antibodies which help protect against many common childhood illnesses and it is one of the most effective ways to ensure child health and survival. Children that have been breastfed for 6 months perform better on intelligence tests, are less likely to be overweight or obese and less prone to diabetes later in life. Women who breastfeed also have a reduced risk of breast and ovarian cancers. However infant feeding practices in India are dismally low. Nearly 2 out of 3 infants are not exclusively breastfed for the recommended 6 months. Barriers to breastfeeding initiation include work-related issues, personal preferences, having an unsupportive partner, feeling embarrassed, concerns about pain, and physical/medical problems, wanting the body back to oneself. The next most frequent reason includes low milk supply, undergoing through certain medications which isn't breastfeeding safe, disease like TB, HIV etc. <sup>(1)</sup>

However, there are many ways to improve lactation with proper balanced diet that includes adequate foods rich in nutrients especially those essential for breastfeeding like Calcium, Zinc, Magnesium, Vitamin B<sub>6</sub>, Thiamin, and Folate. Apart from diet there are many products available in the market like Shatavari that aid in breastmilk production. Keeping this in mind product called "Lactacuki" was thought about. It is packed with ingredients, each of which is touted for its milk-boosting properties that includes:

1. Blend of Whole wheat flour & Sathu Powder provides high biological protein and enhance the nutritional value of cookies. <sup>(2)</sup>
2. Oats - This complex carbs are one of the best foods for boosting the milk supply that stimulate the milk-producing hormone. Oats are also known to contain anti-inflammatory and antibiotic properties too. Essential nutrients present in oats includes: fibre, iron, magnesium, zinc. <sup>(3)</sup>
3. Sesame seeds - Rich in calcium, which is especially important during pregnancy and breastfeeding for bone health of the woman and baby. <sup>(4)</sup>
4. Shatavari Powder - Shatavari (*Asparagus racemosus* Wild) is called as 'Queen of Herbs' in Ayurveda. It occupies an important position in Indian system of medicine as a nutritive herbal plant. Shatavari have been used traditionally for the treatment of many diseases. Its beneficial effects are suggested for increasing lactation as it is well known for its phytoestrogen properties... Roots are rich in trace minerals namely zinc (53.15), manganese (19.98 mg/g), copper (5.29 mg/g), cobalt (22.00 mg/g) along with calcium, magnesium, potassium, zinc and selenium.

Its effect on milk production - Shatavari has lactogenic/galactagogic properties to improve the milk production. The active principles, Shatavarin stimulates the hypothalamus or directly pituitary gland and is antagonist to dopamine receptors, which in turn increases the prolactin secretion resulting in increased milk yield. Shatavari root supplementation increases milk yield after calving, help mammary gland development, hastens letting down time, stimulate lactiferous tissues and keeps udder and treats in smooth condition. It increases the GPT (Glutamic Pyruvate Transaminase) and GOT (Glutamic Oxaloacetate Transaminase) activities which increases the digestibility and nutrient assimilation resulting in the improved galactagogue

activity. Thus, Shatavari can be used as an alternative for lactogenic hormones for inducing and enhancing milk yield. In Ayurveda, Shatavri has been regarded as completely safe for long-term use, even during pregnancy and lactation.<sup>(5)</sup>

5. Flaxseeds - Flaxseeds contain phytoestrogens that boosts breast milk production. It is an excellent source of protein, fibre, omega 3 fatty acids.
6. Almonds – It is rich in magnesium.

Thus, the present study was undertaken to design a food product for lactating mothers with the following objectives-

- To standardize an innovate product
- To study the shelf life of lactacuki
- To access / find good packaging material
- To design a nutrition label and understand the budgeting and marketing aspects of the food product.

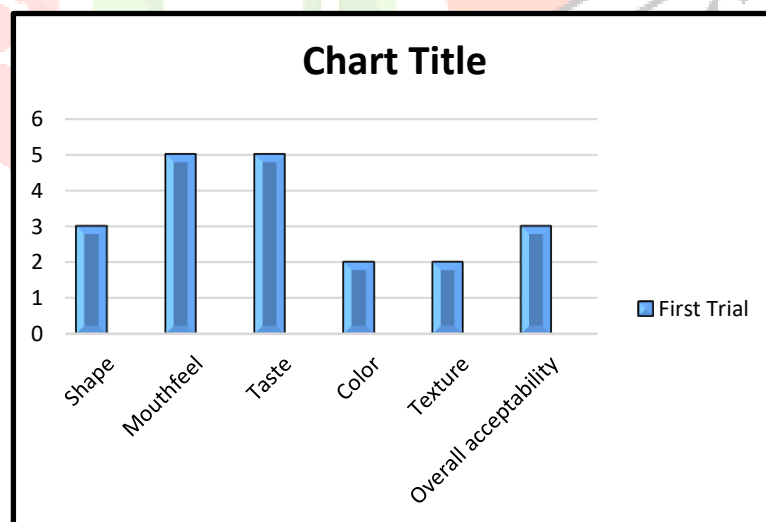
## II. MATERIALS AND METHODOLOGY

After a brain storming session, products that were listed down were herbal tea mixes, lactation cookies etc. Because ingredients of herbal tea mix were not available, so lactation cookies were finalized. And it was further renamed as lactacuki. The cookies were sensory evaluated on 5 panel members. A five-point scale was used where; 1- Poor, 2- fair, 3- Good, 4 - Very good and 5 – Excellent. Result was recorded after every sensory evaluation. Each trial helped to better the product acceptability finally after the third trial, the product was finalized based on the sensory evaluation results

### First Trial

**Table 1: Ingredients of Lactacuki per serving**

Ingredients	Amount
Whole Wheat Flour	30gm
Sathu Powder	15gm
Oat flour,	15mg
Shatavari Powder	5gm
Butter	5gm
Brown Sugar	4gm
White Sugar	2gm
Flaxseed meal	5gms
Dates	15gm
Dark Chocolate	5gms
Sesame Seeds	5gms

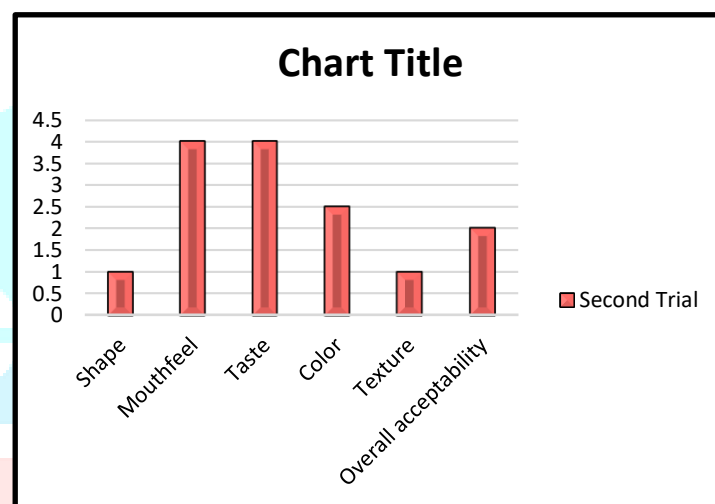


**Fig 1.1 Graphical representation of sensory evaluation result of the first trial**

(The first trial was sensory evaluated on 5 panel members. From the above figure it can be depicted that the characteristics such as mouthfeel, taste was acceptable and color, texture, shape was not accepted. As cookies were undercooked in pressure cooker. Baking time was 10 mins. Since all the characteristic were not approved second trial had to be done.)

**Second Trial**

Table no 2: Ingredients of Second Trial	
Ingredients	Amount
Whole Wheat Flour	30gm
Sathu Powder	15gm
Oat flour	15mg
Shatavari Powder	5gm
Flax seeds powder	5gms
Butter	5gm
Brown Sugar	4gm
White Sugar	2gm
Water	
Dark Chocolate	5gms
Sesame Seeds	5gms



**Fig 1.2 Graphical representation of sensory evaluation result of the second trial**

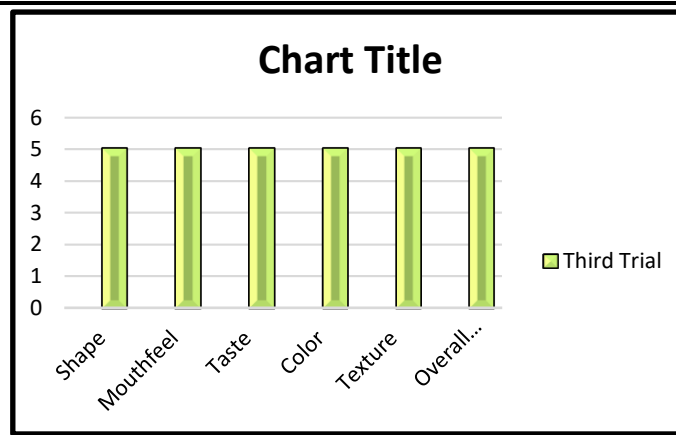
(The second trial was sensory evaluated on the same 5 panel members. From the above figure it can be depicted that the characteristics such as mouthfeel, taste was acceptable and color, texture, shape was not accepted as the product was undercooked and too much moisture was seen. Chocolate should've been filled inside the cookies instead of shredding it outside. It was not baked completely like 30% was yet to be baked. The baking time was 20 mins in this trial. So, third trial had to be done. Since all the characteristic were not approved third trial had to be done.

**Third Trial**

Too much moisture was observed in the product due to the water content in the flaxseed meal. Also, dates were eliminated as it was another factor that was causing moisture in the cookies. These two ingredients were substituted with milk to increase the shelf life of the product. Dark chocolate was replaced with dark Choco chips to improve the texture and attractiveness of the cookie. Standardization of the product was done. It was also noted that undercooked cookies when kept overnight in the fridge, made cookies brittle.

**Table no 3: Ingredients of third trial**

Ingredients	Amount
Whole Wheat Flour	30gm
Sathu Powder	15gm
Oat flour	15mg
Shatavari Powder	5gm
Flax seeds powder	5gms
Butter	5gm
Brown Sugar	4gm
White Sugar	2gm
Milk	5gms
Dark Choco chips	5gms
Sesame Seeds	5gms



**Fig 1.3 Graphical representation of sensory evaluation result of all the 3 trials**

(The third trial was sensory evaluated on the same 5 panel members. From the above figure it can be depicted all the characteristics were acceptable. So, this was finalized into a product for shelf-life study.)

### METHOD OF PREPARATION

1. Roast black gram seeds to make sathu powder, oats, and flaxseeds & grind them into powder.
2. Sift all the dry ingredients in a bowl which includes Whole Wheat Flour, Sathu Powder, Oat flour, Shatavari Powder, Baking powder and Baking soda.
3. Cream the butter, brown sugar, white sugar, and milk together this creates an air pocket making the dough tenderer.  
Note – Butter should be kept at least 1 hour at room temperature.
4. Blend wet and the dry ingredients and knead it into a dough.
5. Fold in the Choco chips and roasted sesame seeds and knead the dough thoroughly.
6. Wrap the dough and refrigerate it for 30 mins.
7. Shape Cookies with a scoop and the dough must be placed evenly on a baking sheet.
8. Preheat the pan for 5mins on a medium flame
9. Then bake the cookies for 20-25 min in a slow flame.
10. Cool the cookie after baking and the healthy delicious cookies is ready to serve.
11. Note - Grease the utensils and the pan.

### III. PACKAGING MATERIAL



Packaging minimizes the damage to the product that can be physical, chemical or microbial. The packaging material used is Standard brown paper bags are made of Kraft paper, which is a paper material made of wood pulp produced during the Kraft process. In the process of making Kraft paper bags, it converts wood into wood pulp by treating wood chips with a special mixture to break down bonds originally found in the wood. Once the process has finished, the pulp is pressed into paper using a paper-making machine, which resembles a printer. Instead of printing with ink, it rolls out blank sheets of paper in long thin slices. Brown Kraft paper is not bleached, which means it is a triple threat – biodegradable, compostable and recyclable! They're a great alternative to plastic. Kraft Paper Pouches are flexible packaging materials made from recycled craft paper lined with aluminum foil on the inside

Advantages of using Kraft paper bags are

**Fig 1.4 Kraft Paper bag for lactatcuki**

- Environmentally friendly - The big environmental convenience of using paper bags is that they are extracted from unbleached, recycled brown Kraft paper a superb solution to save natural resources, energy and reduce greenhouse gas emissions.
- Cost-effective - Paper bags are one of the lowest-cost packaging products available today
- Reuse potential - Unlike single-use plastic bags, Kraft paper bags can be used multiple times, which helps reduce plastic use. They are both recyclable and biodegradable.

- Versatility - Paper bags can be used for so many different things, can be reused repeatedly and can be shipped to a paper mill and remade into new paper <sup>(6)</sup>

This bag was selected as it was easily available in the pandemic situation, it will prevent the cookies from moisture exposure and keep the cookies fresh. It comes with lot of benefits and is the best and affordable alternative to plastic.

#### IV. BUDGETING

Budgeting is an essential aspect while formulating a product as it helps in pricing the product. So that the marketing of the product can be done. But the price should be accurately made and the product should be affordable. Budgeting includes price of the raw ingredients used, labeling, packaging materials, and miscellaneous which includes electricity, gas, salary of the employee, rent, travelling expenses etc.

	Actual price for per cookies	Costing of 1 cookie
Raw ingredients	5	10
Labeling	1	3
Packaging materials	1	2
Miscellaneous – (Labor, gas,)	2	5
Total	10	20

Costing of each cookie is Rs.20/-. Each packet is of 4 cookies. Price of a packet which includes 4 cookies is Rs.80/- So if 30 packets are sold then the total gain would be 2400/- out of which the profit would be Rest. 1410.

#### V. NUTRITION LABEL

The Nutrition Facts label is required by the Food and Drug Administration (FDA) on most packaged foods and beverages. The Nutrition Facts label provides detailed information about a food's nutrient content, it has. Food labelling is vital. Not only is it a legal requirement, it also helps consumers make informed decisions when purchasing food and helps them to store and use the food they've purchased safely. Nutrition labels helps the customer to choose the product wisely. Other than nutrition content the label also includes date of manufacturing, date of expiry, ingredients, and also the nutritional facts. <sup>(7)</sup>

A nutritional label was designed for 'Lactacuki which consisted of ingredients, nutritive value table, packaging date, expiry date, vegetarian mark, manufactured by and contact details.

Actual nutrients requirement for lactating mothers as per the RDA Vs the amount of nutrients per cookie is mentioned below in the tabular form:

Nutrients	RDA	Amount of nutrients in 12g cookies
Energy	2400 kcal	337kcal
Proteins	77.9 g	9.9g
Fats	30g	14.5g
Calcium	1200 mg/day	1488 mg
Iron	25mg/day	10 mg/day
Folic acid	500 mcg	18mcg/day

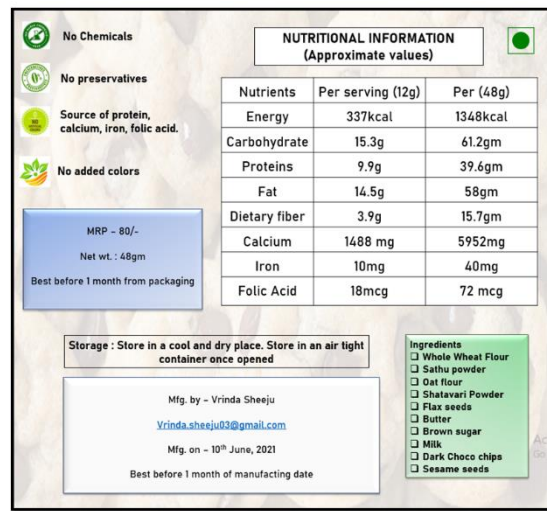


Fig. 1.4 Nutrition label of Lactacuki

## VI. SHELF-LIFE STUDY

Shelf-life study was done with the help of sensory evaluation, the product was evaluated every week for the period of 4 weeks by 5 panel members. The product was evaluated on the scale of 1-5 from Poor to Excellent. Characteristics were Shape, mouthfeel, taste, color, texture, overall acceptability.

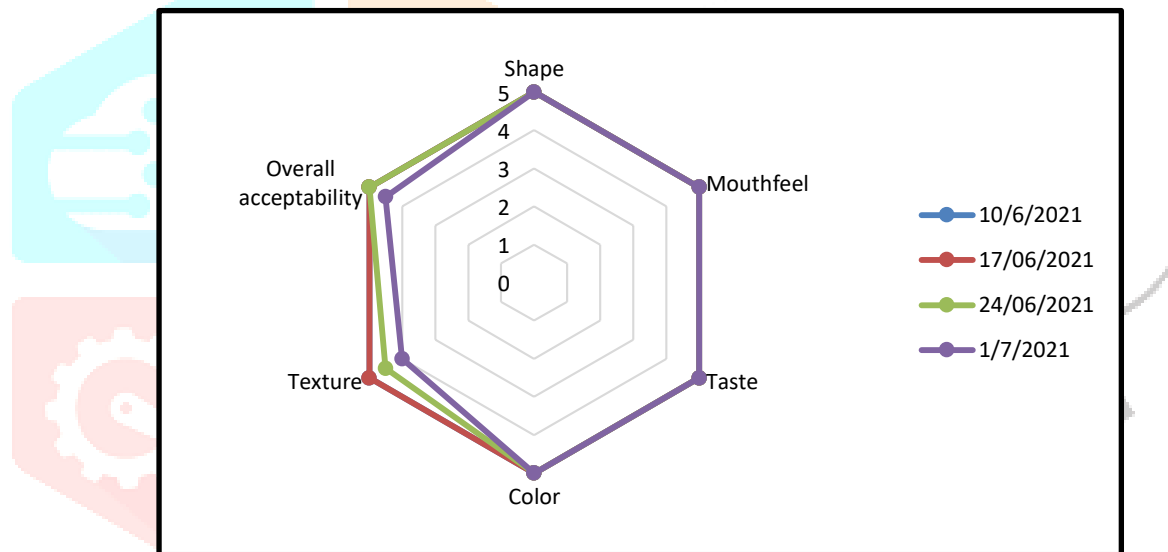


Fig. 1.5 Web diagram of shelf-life study for 4 consecutive weeks

From the above given figure, it can be estimated that in the 1<sup>st</sup> week and 2<sup>nd</sup> week all the characteristics were rated on the 5<sup>th</sup> scale as excellent, on week 3 and 4 all the characteristics were rated on the scale of 5 except for texture. As on 3<sup>rd</sup> week the texture became firmer like it was getting bit difficult to chew and it became more brittle in week 4. This shelf-life study can be concluded that Lactacuki can be consumed before 3 weeks from the manufacturing date.

## VII. MARKETING

The product was marketed digitally as well as through personal selling. Though the targeted groups are Lactating women, but lactacuki can be consumed by everyone. So, the cookies were sold to 10 members through personal selling whereas digital selling was done via Instagram and social media platforms.

## VIII. CONCLUSION

Lactacuki is a nutritious palatable product designed for lactating women because it contains milk boosting properties also some essential nutrients like iron, calcium, proteins, folic acid etc. But it can be consumed by all age groups, cannot be recommended to diabetic patients as it contains sugar in it. It can be consumed as an evening snack. The product can be stored in an air tight container for a month, 3 weeks to be exact, once opened. The price of the product is quite affordable as it is nutritious and organic with no added chemicals or preservatives.

## REFERENCES

- 1) Ruth A. Lawrence (2021). Physiology of lactation, Breastfeeding (Ninth Edition) A Guide for the Medical Profession 2022.
- 2) <https://www.sciencedirect.com/science/article/pii/B9780323680134000031>
- 3) <https://doing-it-myself.com/2016/04/16/sprouted-sathu-maavu-or-health-mix-powder/>
- 4) <https://www.verywellfamily.com/oats-oatmeal-and-breastfeeding-431850>
- 5) <https://www.verywellfamily.com/foods-that-increase-breast-milk-supply431598#:~:text=Sesame%20Seeds%3A%20High%20in%20calcium,%2C%20nuts%2C%20and%20dried%20fruit.>
- 6) **Jaya Bharati, Satish Kumar (2019). Shatavari Asparagus, In book: Phytobiotics and Animal Production (pp.567-590), Publisher: International Books & Periodical Supply Service.**  
[https://www.researchgate.net/publication/331859386\\_Shatavari\\_Asparagus\\_racemosus](https://www.researchgate.net/publication/331859386_Shatavari_Asparagus_racemosus)
- 7) <https://lekac.com/products/kraft-paper-bags-everything-you-need-to-know>
- 8) <https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/nutrition-facts/art-20048426>

