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Production of value-added Shrikhand by using Lemongrass Juice - An Economic Study

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Abstract

This investigation highlights Lemongrass as the flavouring agent, value-added Shrikhand had prepared by the addition of Lemongrass juice with three levels of Flavouring agent i.e., 2.5%, 5%, and 7.5% Lemongrass juice used and the study was laid in Completely Randomized Block Design with three replications. The effect of all treated samples and their interaction was studied on the sensory quality of Shrikhand. The control and experimental samples of different treatments were analyzed for organoleptic qualities (colour and appearance, flavour, body and texture, and overall acceptability) by using a 9-point Hedonic scale. It was observed that the standardized Shrikhand containing 5 % Lemongrass juice (T_2) was at par with control and would be the best option for diabetic consumption` The cost of production for one kg of the product T_0, T_1, T_2, and T_3 was Rs. 217.4 ,219.3, 221.8, and 223.7 respectively.

Keywords: - Shrikhand, Lemongrass juice, Cost of production**.**

Introduction

Presently, people are highly health conscious & hence, market trends of many probiotics' products are rapidly increasing very fast to meet the growing demand of the consumer. (Pal et al., 2018). Shrikhand is a semi-soft sweetish sour whole milk product prepared from lactic fermented curd. The curd (Dahi) is partially strained through a cloth to remove the whey and thus produce a solid mass called chakka (the basic ingredient for Shrikhand). This chakka is mixed with the required amount of sugar, cardamom, nutmeg (jaiphal) etc. to yield Shrikhand. The Shelf Life is 30 days from manufacturing when stored below -18^{0}C.

Shrikhand is one of the important fermented milk products which derives its name from the Sanskrit word "Shrikharani" meaning, a curd prepared with added sugar, flavoring agents like Cardamom & Saffron, etc., and fruits & nuts. It is popular in the western part of the country, especially in Maharashtra, Gujarat & Karnataka. It is known for its high nutritive, characteristic flavour, taste, palatable nature & possible therapeutic value. It is very refreshing, particularly during summer. It can be recommended as a health food for specific patients suffering from obesity & cardiovascular disease due to its low fat and sugar content (Sameem et al.,2018). Lemongrass (Cymbopogon citratus) is a C4 tropical & sub-tropical grows. The lemongrass (Cymbopogon flexuous (Steud) Wats) is a perennial grass belonging to the family Graminaceae & grouped under the genus Cymbopogon. It is locally known by different names such as Gawati Chah: 'Nibugrass', Puthiganda, etc. in different languages. It is of indigenous origin and is a medicinal aromatic plant. (Therat et al., 2017.)

Efforts have been made to review the pertinent literature in respect of the cost of production of value-added Shrikhand Various researchers have been carried out production cost of Shrikhand efforts have been made to calculate and compare the production cost of Shrikhand after considering the significance of traditional knowledge, their combination with scientific know-how and health benefits.

Mane, et al., (2019). Studies on sugar-free Shrikhand prepared by using stevia (Stevia rebaudiana Bertoni) powder. The cost of production was increased with an increased in the rate of addition of stevia powder. Though the cost of production is increased with the addition of stevia powder, it can be compensated with the enjoyment of product taste for the diabetic patient who is prohibited from sugar. Tondare and Hembade (2019) studied the cost of production of dietetic Amrakhand using different levels of stevia leaf extract powder was higher than plain Amrakhand. They observed that the cost of production of dietetic Amrakhand per kg for treatment T_0, T_1, T_2, T_3, T_4, and T_5 were 156.38, 192.14, 195.05, 198.35, 201.60, and 204.93 rupees, respectively. Amrakhand prepared using stevia leaf extract powder proportionally increases the cost of production since it is available at a higher cost. The cost of production of the addition of stevia leaf extract powder in Amrakhand could be lower, further if the same was manufactured on a large scale.

Shrikhand is a highly refreshing and energy-dense dairy dessert due to its high fat, protein, and carbohydrate content. Hence, the current study aimed at evaluating the effect of Lemongrass juice on the sensory quality of Shrikhand to manage and control eating flavoring food. Keeping this in view, an experiment was conducted to develop value added Shrikhand. using Lemongrass juice. The present paper aims at an economic study i.e., cost of production. The present investigation was planned and executed to evaluate the suitability of Lemongrass

juice various levels with Chakka and evaluating the sensory attributes of the Shrikhand.

Ii. Materials And Methods

In this study Laboratory investigation during 2022-23 was conducted. The experiment was carried out in the Department of Dairy Science Research Centre, Yeshwant Mahavidyalaya Nanded, MS.

Control (T_0) and experimental Shrikhand:

Starter culture: Streptococcus thermophilus and Lactobacillus bulgaricus

Buffalo milk
↓
Filtration
↓
Standardization
(Fat 6% and 9% SNF)
↓
Heating (85°C for 30 minutes)
↓
Cooling (25-30°C)
↓
Inoculation (1% starter culture)
↓
Incubation (28-30°C for 10-12 hrs.)
↓
Curd (Dahi)
↓
Cutting/Breaking the Curd
↓
Drainage of Whey
↓
Chakka
↓
Addition of Lemongrass juice
(@2.5%, 5%, 7.5% weight of Chakka)
↓
Kneading
↓
Packaging
↓
Storage (5°C)
↓
Shrikhand
↓
Stored in HDPE Cups

Fig 1. Flow chart of development value added Shrikhand

(**Source**: Aneja et al., 2002)

Method: The present investigation was carried out in the Deptt. of Dairy Sci. Research Centre, Yeshwant College, Nanded in Maharashtra. An attempt was made to add value to the Shrikhand by adding Lemongrass juice three levels of white sugar i.e., 2.5, 5, and 7.5%. to evaluate suitability of Lemongrass juice with Chakka to prepare value-added Shrikhand. The materials used and method adopted are as hereunder:

Materials: Iron karahi was used for concentrating the milk and Food Processor (Make: Philips) was used. Fresh standardized buffalo milk (6% fat and 9% SNF) used for product preparation. It was drastically heat treated at 95°C for 15 min. Followed by its prompt cooling to 37°C and was inoculated with 2% active culture of Dahi. The milk thus inoculated was incubated at 37°C for 16 h, Chakka was prepared from the Dahi. Good quality Lemongrass obtained which was strained through a fine mesh sieve. Sugar used for adding sweetness to Shrikhand was brought from local supermarket. The product was prepared as detailed in the flow diagram (**Fig. 1**).

Statistical analysis: The Completely Randomized Design with three replications was used for the data analysis (Panse & Sukhatme,1985). The effect of all treated samples and their interaction were studied on the sensory quality of the product (Gupta, 1976).

Determination of cost of the product: The cost of the product was calculated at the prevalent prices of raw materials purchased from the local market of Nanded during the study period.

III. Results And Discussion: The data obtained on different aspects of costs that were tabulated have been analyzed critically within and between the treatment combinations. The cost of the ingredient is very important factor besides other factors in determining the cost of

production. It is considered as a basis for price fixation and determining the profit. The price of a product is dependent on the cost of production. The Addition of Lemongrass juice is used as it is health-friendly (prepared without using any chemicals) and as a cheap source of minerals and some vitamins. The results obtained from the study with relevant discussion thereon have been presented. The data obtained on its cost of production are tabulated and analyzed within and between the treatment combinations.

Table No.1. Economics of cost of production of Shrikhand prepared by using Lemongrass juice.

Ingredients	Per **lit./Kg rate in Rs.**	**Control**		**Experimental treatment combinations**					
		TO		**T1**		**T2**		**T3**	
		Qty.	**Cost.**	**Qty.**	**Cost.**	**Qty.**	**Cost.**	**Qty.**	**Cost.**
		(L./g.)	(Rs.)	(L./g.)	(Rs.)	(L./g.)	(Rs.)	(L./g.)	(Rs.)
Buffalo Milk(ml)	58/1lit	1000	58	1000	58	1000	58	1000	58
Culture	6	20	6	20	6	20	6	20	6
Sugar(kg)	40	69	15	350	15	350	15	350	15
Lemongrass	60/50 gm	-	-	2.5	1.5	5	3	7.5	4.5
LPG fuel charges/hr.	1200/ 14kg	15 min	5	15 min	5	15 min	5	15 min	5
Labour/hr.		120/8	6.25	120/8	6.25	120/8	6.25	120/8	6.25
Miscellaneous			3.25		3.25	-	3.25		3.25
Total product Yield obtained(g)		430	-	433	-	435	-	438	-
Cost Shrikhand obtained (Rs.)			93.5		95		96.5		98
Total Cost of Shrikhand obtained**/kg**. (Rs.)			217.4		219.3		221.8		223.7
Total Production Cost for 100g (Rs.)			21.74		21.93		22.18		22.37

The incorporation of different % levels of Lemongrass juice on the physic-chemical attributes, overall acceptability, and cost of manufacture of Shrikhand was studied.

The addition of Lemongrass juice in the production of Shrikhand prepared and the addition of 5% Lemongrass was found to be acceptable as far as the organoleptic score was concerned. Moreover, from the consumer point of view, Lemongrass had the healthier option.

The cost of the ingredient is a very important factor besides other factors in determining the cost of production. It is considered a basis for price fixation and determining the profit. The price of a product is dependent on the cost of production. The cost of experimental Shrikhand was calculated, which is shown in table No.1 from the above-presented data of cost (`/kg) of Shrikhand samples of selected treatment sample and control furnished in the table.

The production cost for one kg of Shrikhand of treatment T_0, T_1, T_2, and T_3 was Rs. 217.4 ,219.3, 221.8, and 223.7 respectively. The production cost for Shrikhand from treatment T_0 (i.e., control) was comparatively low in comparison with treatment T_1, T_2, and T_3. Hence the major ingredient affecting the cost is Lemongrass. The present investigation is supported by the findings of Mane, et al., (2019). Studied on sugar-free Shrikhand prepared by using stevia (Stevia rebaudiana Bertoni) powder. As regards the cost of production per kg, Shrikhand was lowest in T_1 (Rs. 138.12 per kg) and highest in T_5 (Rs. 215.68 per kg). This indicates that an increase in the level of stevia powder showed an increase in the cost of production of Shrikhand. This result is in agreement with Tondare et al., (2019) observed a similar trend while calculating the cost of production of Amrakhand prepared using Stevia leaf extract powder proportionally increase the cost of production due to the cost of stevia leaf extract powder and reduction in the quantity of product.

Present investigation is also in agreement with finding of Sonwane, et al., (2022) while calculating the economics of Shrikhand blended with Jaggary powder.

IV. Conclusion

From the present investigation, it is concluded that the Shrikhand prepared with 5% Lemongrass juice (T_2) is more acceptable. The cost of production of Shrikhand using different levels of Lemongrass juice is higher than the control. The cost of production of value-added Shrikhand and control (T_0) was 221.8 and Rs. 217.4 respectively.

Future Scope

The developed Shrikhand might be fruitful for health-conscious people due to its low-calorie value. There is scope for further research in standardized low-calorie Shrikhand dry instant mix for commercial production.

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Conflict of Interest: There is no conflict of interest.

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