



# FORMULATION AND DEVELOPMENT OF ROSE PETAL AND LEMON JUICE INCORPORATED HIBISCUS SQUASH

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**Abstract:** Squash (sometimes also known as cordial) is non-alcoholic concentrated syrup used in beverage making. It is usually fruit-flavored and some traditional squashes contain herbal extracts, elderflower and ginger. A fresh hibiscus squash is prepared from hibiscus petal (*Hibiscus rosa-sinensis*), damask rose petal (*Rosa × damascene*) and lemon (*Citrus lemon*) was developed and formulated for its storage stability. Addition of hibiscus and rose petals to lemon juice increases the nutritional value of the drink and also provides various health benefits to consumers. Hibiscus petal contains calcium; iron, vitamin C, phosphorous, riboflavin, antioxidant and it has health benefits of lowers cholesterol, prevent cancer, improves digestion, and lowers blood pressure. Rose petal includes treating of abdominal pain, chest pain, excessive menstrual bleeding, digestive issues, and constipation, wound healing, and reduces depression, stress, and anxiety. Lemon contains vitamin C, potassium; antioxidant and health benefits include reduce risk of heart disease, anaemia, kidney stone, digestive issues, cancer. These hibiscus squash (Ready-To-Serve) beverage were prepared by adding different ratios of hibiscus and rose petal, lemon juice (60:30:10, 55:25:20 and 50:20:30). The sensory characteristics of hibiscus squash were evaluated for 3 months at 15 days of storage interval. Regarding sensory attributes, maximum score (5) for overall acceptability was observed in hibiscus and raised petals, lemon juice ratio of 60:30:10. Sensory evaluation indicated that hibiscus squash beverage were highly acceptable throughout the storage period.

**Index Terms** – Squash, Hibiscus, Rose, Citrus, vitamin C, Antioxidant, Sensory, Storage.

## I. INTRODUCTION

In a hot country like India, the use of refreshing and thirst quenching beverages, mostly falling under the category of aerated waters has become stagnant. For a long time, the use of flavored thick syrups has been very common. During the last few decades, the products like squash, cordials, crushes, ready-to-serve beverages have been introduced in the country on commercial scale to a large extent. Squash (sometimes known as cordial in English, dilute in Hiberno English, and diluting juice in Scottish English) is a non-alcoholic concentrated syrup used in beverage making.

Modern squashes may also contain food coloring and additional flavoring. Some traditional squashes contain herbal extracts, most notably elderflower and ginger. Squash is mixed with a certain amount of water or carbonated water before drinking. The amount of water added is to taste, with the squash becoming less strong the more it is diluted. Citrus fruits (particularly orange, lime and lemon) or a blend of fruits or flowers and berries are commonly used as the base of squash.

Squash is prepared by combining one part concentrate with four or five parts water (carbonate or still). Double-strength squash and traditional cordials, which are thicker, are mixed with nine parts water to one part concentrate. Some squash concentrates are weak, and these are sometimes mixed with one part concentrate and two or three parts water. As per FSSAI specifications, squash should contain not less than 25% fruit content in finished product and the total soluble solids content should not less than 40\* Brix. The acidity of the squash should not be more than 3.5% as anhydrous citric acid.

In this squash addition of hibiscus petal, rose petal and lemon juice allow the product with enrichment of energy, antioxidants, vitamin C, potassium, flavors and freshness to human body. The quality attributes and shelf-life of squashes is depending upon the ingredients and their proportions and storage conditions.

Processing of hibiscus squash is a natural process and also to increases the health benefits and consumer acceptance of the product. Hibiscus and rose petals, lemon juice are better in nutritional quality on account of a higher antioxidant, higher

bioactive minerals, B-complex vitamins, higher vitamin C and ascorbic acid. Based on all these aspects, the present study is intended to develop a healthy nutritious squash by adding hibiscus and rose petals, lemon juice to enhance the digestibility and absorption into formulated product and it can help to prevent and reduce the risk of cancer, menstrual problems and also increase the immunity power.

## II. METHODOLOGY

The methodology pertaining to study entitled on “Formulation and Development of Rose petal and Lemon Juice Incorporated Hibiscus Squash” is presented.

### Selection and procurement of raw materials:

**Hibiscus flower:** Hibiscus flower is collected from the home garden. Hibiscus petal contains calcium; iron, vitamin C, phosphorous, riboflavin, antioxidant and it has health benefits of lowers cholesterol, prevent cancer, improves digestion, and lowers blood pressure.

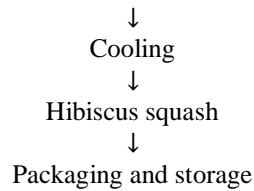
**Damask Rose:** Damask Rose is also collected from the home garden. Rose petal includes treating of abdominal pain, chest pain, excessive menstrual bleeding, digestive issues, and constipation, wound healing, and reduces depression, stress, and anxiety.

**Lemon:** Lemon is purchased from the local shop in Nehru nagar, Coimbatore. Lemon juice contains vitamin C, potassium; antioxidant and health benefits include reduce risk of heart disease, anaemia, kidney stone, digestive issues, cancer.

### Processing of Ingredients:

Method for processing edible flowers; the surface moisture of edible flowers are dried by air and then the edible flowers are delivered in a container with the mixed liquid of honey, rock candy, citric acid and water, boiled and cooked. The method of the present invention has simple process steps and can prepare the filling from the petals of flowers. By this method it can keep the original shape and colour, good mouth feeling and rich nutrition and can be preserved for a long time, without adding preservative agents.





### III. FIGURES AND TABLES

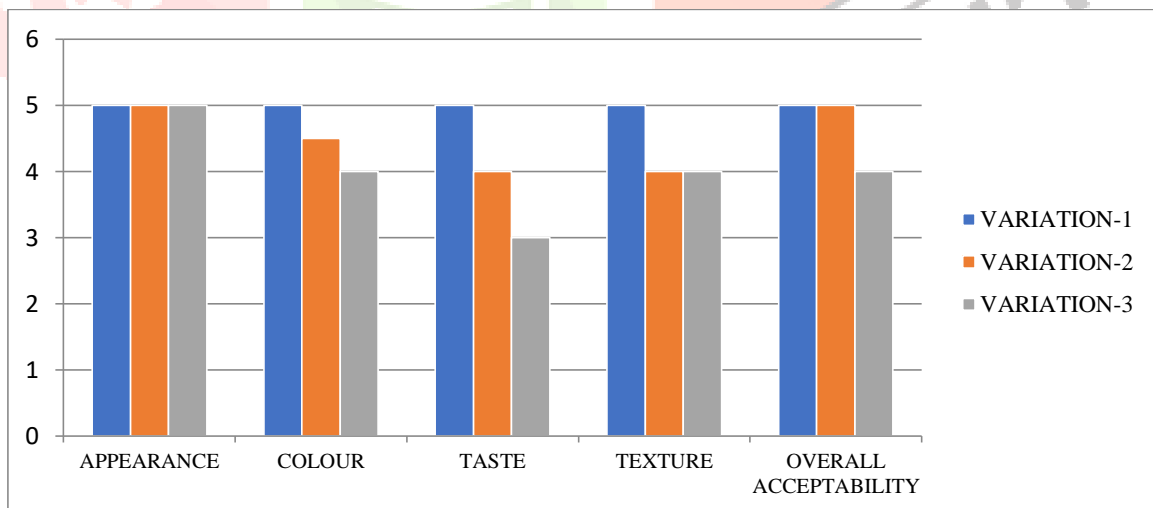
**TABLE 1: STANDARDIZATION OF HIBISCUS SQUASH**

S.NO	INGREDIENTS	VARIATION I	VARIATION II	VARIATION III
1.	Hibiscus petal	60g	55g	50g
2.	Rose petal	30g	25g	20g
3.	Lemon juice	10g	20g	30g
	<b>TOTAL</b>	100g	100g	100g

**TABLE 1:** The formulated product was standardized in terms of amount of ingredients, procedure and serving size. For the purpose of standardized products, a number of preliminary trials were conducted. It was formulated into three different variations. Different variations of Hibiscus Squash incorporated with Rose petal and Lemon juice were prepared by altering the proportion of all the ingredients for standardization.

**TABLE 2: ORGANOLEPTIC EVALUATION OF HIBISCUS SQUASH**

CRITERIA	VARIATION-1	VARIATION-2	VARIATION-3
APPEARANCE	5±0.3	5±0.3	5±0.6
COLOUR	5±0.4	4.5±0.5	4±0.6
TASTE	5±0.4	4±0.6	3±0.8
TEXTURE	5±0.5	4±0.7	4±0.8
OVERALL ACCEPTABILITY	5±0.7	5±0.6	4±1



**FIGURE 1: FIGURE OF ORGANOLEPTIC EVALUATION OF HIBISCUS SQUASH**

Organoleptic evaluation of Hibiscus Squash incorporated with Rose petal and Lemon juice has given to 25 semi trained panel members using the score card with a five hedonic scale. In evaluation, the qualities of the product were asked to judge by 25 semi trained panel members with respect to appearance, colour, texture, taste and overall acceptability. The individual mean sensory scores for variation I, variation II and variation III are noted.

TABLE 3: NUTRITIONAL ANALYSIS OF HIBISCUS SQUASH

S. NO	FOOD ITEM	QUANTITY (g)	ENERGY (kcal)	CHO (g)	CALCIUM (mg)	VIT-C (mg)	IRON (mg)	POTASSIUM (mg)
1.	Hibiscus petal	60g	40	5	10.85	10	8	102
2.	Rose petal	30g	35	3	2.45	-	-	-
3.	Lemon juice	10g	3.66	0.7	2.01	4.82	0.01	11.3
4.	Sugar	200g	800	200	-	-	-	-
		<b>TOTAL</b>	<b>878.66</b>	<b>208.7</b>	<b>15.31</b>	<b>14.82</b>	<b>8.01</b>	<b>113.3</b>

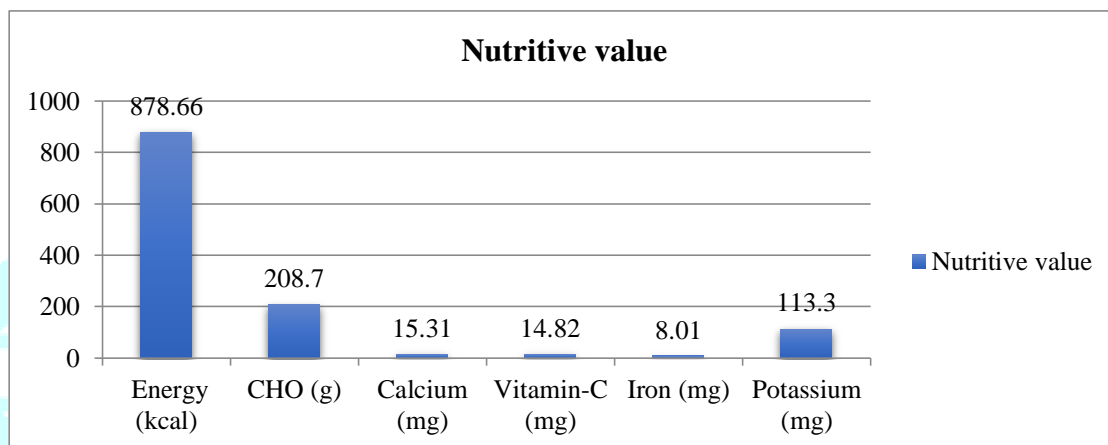


FIGURE 2: FIGURE OF NUTRIENT ANALYSIS OF HIBISCUS SQUASH

From the above table and figure, it was clear that the formulated hibiscus squash contains high nutritional values like **Energy (878.66kcal)**, **Carbohydrate (208.7g)**, **Calcium (15.31mg)**, **Vitamin-C (14.82mg)**, **Iron (8.01)** and **Potassium (113.3mg)**. The selected variation has more amounts of Energy, Carbohydrate and Potassium. Hence it reduces the risk of health.

TABLE 4: COST CALCULATION OF HIBISCUS SQUASH

S.NO	INGREDIENTS	QUANTITY	AMOUNT
1.	Hibiscus petal	60g	Rs.5.00
2.	Rose petal	30g	Rs.10.00
3.	Lemon	10g	Rs.5.00
4.	Sugar	200g	Rs.10.00
	<b>TOTAL</b>		<b>Rs.30.00</b>

Raw material cost = Rs.30.00

Overhead cost = Rs.1.66

Total cost = Rs.30.00 × Rs.1.66  
= Rs.49.8

Therefore, the total cost of hibiscus squash = Rs.50.00

The cost of (V-I) Hibiscus squash was computed by calculating the raw ingredients used for the preparation of hibiscus squash. The product cost (100g) of the hibiscus squash was Rs.50.00. This proves that rose petals and lemon juice incorporated hibiscus squash increases not only their nutrient content but also makes the product suitable in terms of its sensorial and textual attributes.

#### IV. DISCUSSION

Recently, consumers have shifted their consumption from aerated and carbonated drinks to healthy and low sugary drinks. Moreover, the variety offered in squashes on the basis of its ingredients like fruits, vegetables, herbs and spices has made it cater to the different needs of different consumers unlike the soft drinks industry. Also, because of the splurging demand ready-to-serve drinks and the squash drinks being more affordable, healthy, convenience, quality, cost-efficiency and available it is seen to be attracting a majority of the consumer market.

Hibiscus is a good source of antioxidant; it can help boost immune system and may help to prevent cell damage caused by free radicals in the body; this can reduce your risk of developing many significant health complications such as heart disease, diabetes treats menstrual problems and cancer. Damask rose helps beat anxiety and depression; which is prized for its anti-aging effect on the skin, is also an ingredient in many cosmetics and is included in massage oils for its sensual and relaxing properties. Lemon is a great source of vitamin-C, antioxidant and fibre; lemon contains many plant compounds, minerals and essential oils. Eating lemon may lower risk of heart disease, cancer, kidney stone, blood pressure, weight loss, provides immunity and irregular menstruation.

The salient findings of the study are the organoleptic evaluation of the hibiscus squash, the nutrient analysis of the mock meat and the cost effectiveness of the hibiscus squash are discussed under the tables and figures. Storage stability is essential for the shelf life of the food products. Packaging ensures the protection of the products that are meant to be distributed in the market for the purpose of sale, storage, use, etc. Generally it refers to the process of designing, evaluating and producing packages. The formulated hibiscus squash has been packed in an air tight Glass Containers such a way that ensures the shelf life of the food product.

#### V. CONCLUSION

In present scenario, one needs to emphasize on the consumption of locally available and cost-effective sources which could enhance the nutritional potential of traditional recipe. Moreover this study was carried to prove a healthy and nutritious drink to the people. The nutrient rich squash were formulated by incorporating with a familiar rose petal and lemon juice was prepared to the product. Variation – 1 is highly acceptable compared to variation – 2 and Variation – 3. Mixture of hibiscus petal, rose petal, lemon juice and sugar is a good source of energy, carbohydrates, calcium, vitamin-C, potassium, iron and antioxidants. The sensory characteristics were most acceptable according to the consumer preference which authenticates it would be a healthy and nutritious product for children, adolescents and adults.

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