



# STANDARDIZATION OF MUFFINS ENRICHED WITH VITAMINS AND NUTRIENTS

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## ABSTRACT

A muffin is an individually portioned baked product, it is sweet baked good variety of muffins are available in the market which are healthy also. The basic aim of study is “Standardization of muffins enriched With Vitamins and Nutrients” muffins are prepared with standard method with using cooked rice, cornmeal (yellow corn flour), curd and vitamin E capsule and other ingredients. Three different variant are prepared using white sugar, brown sugar and honey. Proximate composition of raw materials, Sensory attributes, Physico-chemical constituents and Microbiological analysis was analyzed from prepared product and collected data. The range of acidity of muffins was found to be 0.225, 0.135, 0.120 S1, S2 and S3 respectively. The protein content for muffins was 9.56, 10.03, and 9.08 % for S1, S2 and S3 respectively. The fat content of muffins was 7.0, 7.2, 6.7 % for treatment S1, S2 and S3 respectively. The moisture content of muffins was found to be 22.8, 21.46, 24.06 % for treatment S1, S2 and S3 respectively. The ash content of prepared muffins was 1.78, 1.87, 1.94 % for treatment S1, S2 and S3 respectively. Storage study of muffins had good storage stability during 5-6 days of storage at 4°C and 3 days at room temperature. Sensory analysis showed a significant difference in different sensory attributes of S2

sample with the rest of the treatments. S2 supplementation of muffins made with the use of brown sugar was much preferred. Hence, this muffins are delicious and can provide health benefits to the consumer.

[Key words: Muffin, Nutrients, Vitamin, Physicochemical, Rice, Cornmeal]

## 1. INTRODUCTION

The globalization scenario in new millennium year has increased the demand for bakery products along with ready to eat (RTE) foods due to change in economic consideration, westernization, urbanization, busy life and increased women employment. In present invigilation attempts have been made to develop nutrient and vitamin rich muffin by the addition of optimized proportion of cornmeal (yellow corn flour) with other ingredients refined flour, rice, curd etc.

Yellow corn flour was combined with all-purpose flour, curd and cooked rice. It got higher nutritional value such as Protein, Carbohydrate, Energy, Moisture, dietary fiber, etc. Muffins are a kind of semi-sweet cake or bread that's baked in acceptable portion. They are like cupcakes, though they're sometimes less sweet and lack in icing. Savory varieties, such quick bread muffins or cheese muffins additionally exist. The term additionally refers to disk- formed gem bread, referred to as a bread outside the UK. As yank vogue muffins are obtainable in commonwealth countries, the term muffins either check with product, with the context sometimes creating clear that is supposed. Yellow corn flour created by grinding dried yellow corn kernels into a powder finer than corn meal adds selection to your baking larder and makes a welcome addition to food like muffins and breads. As a result of it doesn't contain gluten, yellow corn flour provides a healthy different to flour if you follow a diet.

Rice contains nutrition which will simply be enclosed in your diet on a day to day. In fact, rice helps ease bowel movements that makes it safe to consume on a daily basis. It contains a high quantity of fiber that is crucial for reducing constipation and regulation your system. It works as a natural drug for your body.

Curd may be a dairy foodstuff. It is fermented known everywhere on the planet. The fermentation method takes place by adding bacterium to the milk. The distinctive biological process worth of curds is helpful in varied ways that. Except for enhancing the style of assorted foods, curd conjointly improves the digestion and provides strength to bones and teeth. Regular consumption of curds conjointly lowers the cholesterol levels and reduces high vital sign (blood pressure).

Vitamin E facilitate scale back inflammation within the body, improve skin health, scale back skin disorder, and forestall age-related eye issues. However, analysis studies have shown that associate intake of a high indefinite quantity of fat-soluble vitamin for a chronic amount might cause heart issues and even cancer.

High quality honey that is minimally processed, unheated, and contemporary contains several necessary bioactive plant compounds and antioxidants, like flavonoids and synthetic resin acids. Darker varieties tend to supply additional antioxidants than lighter varieties, Antioxidants facilitate neutralize reactive element species (ROS) in your body, which might build up in cells and cause harm. This harm will contribute to conditions like premature aging, kind two polygenic disorder (type 2 diabetes), and cardiovascular disease in and of itself, several of honey's health edges are attributed to its inhibitor content.

Brown sugar may be a natural sweetener that you just will use to form a range of foods style higher. Like each natural sugar, sugar is created by taking sugar juice out of sugar beet or sugar cane plants. Individuals build sugar by commixture white sugar with syrup, giving it a special flavor and distinct nutritional makeup. Brown Sugar is comparatively low in nutrients. It's high in calories and meant to supply your body with carbohydrates to use as energy. Brown sugar contains Zero grams of fat, sterol, protein, sodium, carbohydrates.

## 2. MATERIAL AND METHOD

### 2.1 Collection of raw materials:

Raw materials: rice, sugar, baking powder, baking soda, all-purpose flour, unsalted butter, brown sugar, honey, dark chocolate and curd were purchased from local super market of Vadodara, Gujarat. Cornmeal (yellow corn flour) was purchased from local flour mill of Vadodara, Gujarat. The vitamin E capsule was purchased from local medical of Vadodara, Gujarat

### 2.2 Preparation of muffins:

To prepare muffins first all the ingredients are collected and then rice is cooked. Then curd and cooked rice are mixed and blended with the help of mixer grinder. Put the rice curd mix in bowl. Take separate bowl and now add all the dry ingredients all-purpose flour, cornmeal, baking powder and baking soda according to decided measurement. Now add melted dark chocolate, melted unsalted butter, rice and curd mixture, Vitamin E capsule and little amount of water now add sweetener (white sugar or brown sugar or honey) and make a batter. Preheat the microwave oven at 150° C for 5-10 minutes and fill the muffin mould with appropriate amount of batter. Place the moulds in microwave oven at 130° C for 25-30 minutes. After baking take out the muffins out of the microwave let it cool for 2-5 minutes.

According to three different sweetener three samples were prepared Named  $S_1$ ,  $S_2$  and  $S_3$

Table No.1 Sweeteners used in muffin formulation.

Sr. No.	Sample No.	Used sweetener
1	$S_1$	White sugar
2	$S_2$	Brown sugar
3	$S_3$	Honey

Table No. 2 Composition of muffin sample

Ingredients	Sample 1	Sample 2	Sample 3
all-purpose flour	50 (g)	50 (g)	50 (g)
Rice	20-25 (g)	20-25 (g)	20-25 (g)
Cornmeal	15-20 (g)	15-20 (g)	15-20 (g)
Unsalted butter	20-25 (g)	20-25 (g)	20-25 (g)
Sugar	35 (g)	-	-

Brown sugar	-	35 (g)	-
Honey	-	-	25-30 (ml)
Curd	20 (g)	20 (g)	20 (g)
Dark chocolate	10 (g)	10 (g)	10 (g)
Vitamin E	400 (mg)	400 (mg)	400 (mg)
Baking soda	1 (g)	1 (g)	1 (g)
Baking powder	0.5 (g)	0.5 (g)	0.5 (g)

### 2.3 Determination of proximate composition of the muffins.

Muffins were analyzed for moisture, protein, fat, carbohydrate, acidity and ash contents according to the methods described in Association of Official Chemists [AOAC] (2005). ). Food energy value (Kcal/100 g) was determined according to the method of Marero et al. (1998) using the factor  $(4 \times \% \text{Protein}) + (4 \times \% \text{Carbohydrate}) + (9 \times \% \text{Fat})$ . Microbial analysis is also done by using agar and spreading method.

### 2.4 Determination of physical characteristics of the muffins.

#### 2.4.1 Weight

The weights of muffin samples were determined with the aid of a weighing balance (model) immediately after cooling.

#### 2.4.2 Diameter

The diameter (D) of the muffin was determined according to the method of AACC (2000). Muffins were placed edge to edge and their total diameter was measured with the aid of a ruler. The experiment was repeated three times.

#### 2.4.3 Size

The size of muffins samples were determined with the aid of a ruler.

### 2.5 Sensory evaluation of the muffin.

Muffin sample were evaluated by a students and staff of the faculty of food technology, Parul University, after cooling from baking In order to evaluate cookies sensory characteristics like color and appearance, texture, flavor, aroma, taste and overall acceptability. Ratings of preference were followed by ratings of taste and texture attributes. Muffins produced from all three sweetener, along with the reference sample were presented in coded form on plates and were randomly presented. The panelists are used 10 point hedonic scale (1 = dislike extremely to 10 = like extremely). The panelist assigned scores for each parameter as against the maximum score of 10.

### 2.6 Study the shelf life of product.

The nutrients and vitamin enriched muffins was packed in plastic cups and stored under refrigeration temperature (4°C). The packed samples confirming to the different. The nutrients and vitamin enriched muffins was packed in plastic cups and stored at room temperature.

### 3. RESULT AND DISCUSSION

#### 3.1. Proximate composition of the muffins

The result of the proximate composition of the muffins are shown in table.no.3. The result shows that the highest protein content 10.03% in muffin sample  $S_2$ , while the lowest protein content 9.08% in muffin sample  $S_3$ . The moisture content of muffin samples are 22.8 % in  $S_1$ , 21.46 % in  $S_2$  and 24.06 % in  $S_3$ . The  $S_2$  sample had the highest carbohydrate content while the  $S_1$  sample had the lowest carbohydrate content. The highest fat content 7.2 % of muffin  $S_2$ , while the lowest fat content 6.7 % of muffin  $S_3$ . The highest Ash content of 1.94 % in muffin  $S_3$ . Considering the importance of these nutrients to human health, the cookies with curd, rice, cornmeal and vitamin E is likely to have massive benefits to the consumers.

Table.no.3 proximate composition of the muffin samples

Sample code	Moisture	Protein	Ash	Fat	Acidity	Carbohydrate	Energy value (Kcal/100 g)
$S_1$	22.8	9.56	1.78	7.0	0.225	50	301.24
$S_2$	21.46	10.03	1.87	7.2	0.135	52	314.00
$S_3$	24.06	9.08	1.94	6.7	0.120	51	300.62

In

observation of microbial analysis there is no growth of any microorganism is seen after 24 hours

#### 3.2. Physical characteristics of cookies

Table.no.4 shows that physical properties of the prepared muffins

Sample code	Weight	Diameter	Size
$S_1$	46 ( $\pm 2$ ) gram	3.9 cm	5.6 cm
$S_2$	42 ( $\pm 2$ ) gram	3.8 cm	5.8 cm
$S_3$	49 ( $\pm 2$ ) gram	3.8 cm	5.8 cm

#### 3.3. Sensory characteristics of muffins

The result of sensory evaluation of the prepared muffin samples from Rice, Cornmeal (yellow corn flour) and Curd are presented in table.no.5. The mean score of color, taste, texture, appearance and overall acceptability for the muffins were notably different from one another.

The color and appearance ranged between 8.0 and 9.0. Muffin sample 3 had the lowest value while sample 2 had the highest value. In addition, this could be an indication that substitution of sweetener in muffins formulation actually provide more visual appeal to product.

Based on taste, texture and flavor the score for the muffin ranged from 7.5 to 9.0, 7.5 to 8.5 and around 8.5 respectively. Muffin sample 3 had the lowest value while the muffin sample 1 had the highest value.

The mean scores for the overall acceptability of the muffins were above 7.0, which indicating the high acceptability of the cookies sample. The cookie sample 2 had the highest value while cookie sample 3 had the lowest value. It was observed that for most of the parameters studied, this muffins are healthier than other muffins because it contain good amount of vitamin and minerals.

Table No.5 Sensory analysis of prepared muffin samples

Sample code	Color And Appearance	Texture	Flavor	Taste	Overall acceptability
$S_1$	8.5	8.0	8.5	8.5	8.3
$S_2$	9.0	8.5	8.5	9.0	8.7
$S_3$	8.0	7.5	8.5	7.5	7.8

The product was found to be highly nutritious because of Rice, curd and cornmeal which consists of carbohydrate, protein, vitamin and lots of nutrients. Chemical and sensory attributes of the muffins were evaluated. In the result of sensory analysis it was seen that 'S-2' sample is more acceptable. It contains 1.87% ash, 21.46% moisture, 7.2% fat, 10.03% protein, 52% carbohydrate and 0.135% acidity also high in vitamin and nutrients. The muffins have an adequate nutritional value and shelf life without adding preservatives, which supports and strengthen the large scale commercial production. Muffins are having good digestible and appetizing properties and are known for medicinal and therapeutic value. Therefore we recommend the use of rice, curd and cornmeal for the formulation of muffins which in turn also helps to increase overall nutritional value of product.

#### 3.4 Shelf life of muffin

The sample which are stored at refrigeration temperature (4°C) are in good condition till day 6. Hence the muffins can be stored in refrigerator for at least 5 days. The sample which are stored at room temperature get spoiled on day 5. Hence it can be noted that it is good for eating till 2 – 4 days. There is growth of white fluffy mold on the surface of the muffins also inside of muffin is spoiled because of the small amount of Mold.

#### 4. SUMMARY AND CONCLUSION

The product was found to be highly nutritious because of Rice, curd and cornmeal which consists of carbohydrate, protein, vitamin and lots of nutrients. Chemical and sensory attributes of the muffins were evaluated. In the result of sensory analysis it was seen that 'Sample 2' sample is more acceptable. It contains 1.87% ash, 21.46% moisture, 7.2% fat, 10.03% protein, 52% carbohydrate and 0.135% acidity also high in vitamin and nutrients. The muffins have an adequate nutritional value and shelf life without adding preservatives, which supports and strengthen the large scale commercial production.

Muffins are having good digestible and appetizing properties and are known for medicinal and therapeutic value. Therefore we recommend the use of rice, curd and cornmeal for the formulation of muffins which in turn also helps to increase overall nutritional value of product.

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