

To Conduct the Nutrient and Objective Analysis of Burfi Enriched with Oats.

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ABSTRACT

Indian sweets are locally called as Mithai. Sweets are indispensable part of Indian culture for festive seasons. In the present study milk based sweet i.e burfi was prepared, with one basic and two variations. Same method of preparation and temperature was followed for preparing both basic and the variations. All the variations were formulated. To develop a value added burfi, oats flour was incorporated, whereas the commonly consumed maida burfi was prepared as a basic. (3) By adding known quantities of oats flour in place of maida, two variations were prepared. Enriched Burfi was subjected to nutrient analysis where the protein, fat, fibre, moisture and ash content was analysed in the laboratory using standard methods. (1) It was also subjected to texture analysis by using a texturometer. The variations enriched burfi was found to be superior to the basic products in terms of nutrient analysis and texture analysis

INTRODUCTION

Indian sweets are locally called as Mithai. They diverge in Taste, aroma, shapes and colours. Sweets are indispensable part of Indian culture for festive seasons.

BURFI:

Burfi, is a sweet confectionary from the Indian subcontinent. Plain burfi is made from condensed milk or khoa cooked with sugar until it solidifies. (1) The many varieties of burfi include besan burfi (made with gram flour), kaaju burfi (made with cashews), and pista burfi (made with ground pistachios). The name is derived from the Persian word barf which means "snow", since burfi is similar to ice/snow in appearance, this is why it is served cold. Burfi is often flavored with fruit (such as mango or coconut) or nuts (such as cashew and pistachio) and spices such as cardamom or rose water. Burfi contains high amounts of fat (19.52%) and sugar (29.4%)(4)

Burfi has been flavoured as one of the most popular khoa based sweet all over India. The adaptability of khoa in terms of its flavour, body texture to blend with a wide range of food adjust had permitted development of an impressive array of Burfi varieties. (3)

KHOA:

Khoa is a milk food widely used in Indian and Pakistani cuisine, made of either dried whole milk or milk thickened by heating in an open iron pan. It is similar to ricotta cheese, but lower in moisture and made from whole milk instead of whey. Khoa is normally white or pale yellow. Khoa is made by simmering full-fat milk in an iron karahi for several hours, over a medium fire. The gradual vaporization of its water content leaves coagulated solids in milk, which is khoa. (2)

OATS:

The common oat (*Avena sativa*) is a species of cereal grain grown for its seed, which is known by the same name (usually in the plural, unlike other grains). Oats have numerous uses in food; most commonly, they are rolled or crushed into oatmeal, or ground into fine oat flour. Its consumption is believed to lower LDL ("bad") cholesterol, and possibly to reduce the risk of heart disease. Oats contain more soluble fibre than any other grain, resulting in slower digestion and an extended sensation of fullness. One type of soluble fibre, beta-glucans, has proven to help lower cholesterol. (8) Oats with elevated β -glucan concentrations can be successfully incorporated into extruded breakfast cereal with minimal processing alterations.

AIMS AND OBJECTIVES

AIM:

To conduct the nutrient and objective analysis of the developed product

OBJECTIVES:

The objectives of the study were as follows:

1. To calculate the nutritive value of Burfi and compare with the chemically analysed values.
2. To analyze the protein, fat, fibre, moisture and ash content of the Burfi.
3. To analyze the texture of the developed product.

METHODOLOGY

PRODUCT DEVELOPMENT:

Product development in nutritional context means, the act of developing a basic product into a new or value added product, which is high in terms of nutrients and other health benefits. Because of the quality and sometimes almost mystical reputation and characteristics of most primary products, their addition to other products usually enhances the nutritive value or quality of these secondary products. For this reason, the secondary products, which partially, or wholly can be made up of primary products, are referred to here as “Value added” products or developed product.

The product has been developed as a value added sweet item which can be given to normal population of all the age groups except geriatrics. The main ingredients of the basic is khoa, which is the rich source of calcium and proteins. The limitations and household environment was taken into considerations in the preparation method.

PROCUREMENT OF SAMPLE:

All the ingredients used for the preparation of basic and variations were procured from the local shop at Langar house, Hyderabad.

FORMULATION:

The method of preparation of basic and variations is same for making burfi. In the variations different quantities of oats flour was substituted with maida and sugar quantity is kept constant for all the products.

LIST OF INGREDIENTS FOR BASIC AND VARIATIONS:

INGREDIENTS	BASIC	VARIATION I	VARIATION II
Khoa(g)	60	60	60
Powdered sugar(g)	30	30	30
Maida(g)	10	5	2.5
Oats flour(g)	–	5	7.5

METHOD OF PREPARATION:

STEP 1: Khoa was heated with stirring in karahi till pasty consistency was obtained.

STEP 2: Maida was added to heated khoa and mixed well

STEP 3: To the above mixture powdered sugar was added and was heated till it begins to leave the sides of karahi.

STEP 4: The above mixture was spread on the greased plate and was allowed to cool.

STEP 5: After the mixture was set it was cut into the desired shapes.

NOTE: The method of preparation of variations is same except in the step 2 where maida and oats flour in proportions 10:0, 5:5 and 2.5:7.5 are taken in basic and variations 2 & 3 respectively was added to the heated khoa.

NUTRIENT ANALYSIS:**PROTEIN CONTENT ESTIMATION:**

The protein content of the sample was estimated using Dumas Method, Where the known amount of sample is combusted to know the nitrogen content present in it.

FAT CONTENT ESTIMATION: By using the Soxtherm Method the sample is immersed in hot solvent the free fat is removed more quickly than the traditional method. It can also evaporate and recover the solvent.

FIBRE ESTIMATION: For crude fibre the samples are digested in acid, rinsed, and boiled in caustic rinsed again and then taken out and dried by using **Fibretherm - Analysis**. After the boiling, rinsing and filtration phases, the residue of chemicals is sucked off automatically.

MOISTURE ESTIMATION:

Moisture was determined according to the procedure given by AOAC (1975) by drying the sample (2g) at 105°C in moisture oven in pre dried and weighed aluminum dishes until constant weight was obtained.

TOTAL ASH ESTIMATION:

Total ash in the sample was determined according to the method of AOAC (1975). Two-gram sample was charred in predried and weighed porcelain crucible. Charred sample was incinerated in muffle furnace at 500-570°C for 8 hours or till the ash becomes white or grayish white in colour. After ashing porcelain crucibles were removed, allowed to cool in desiccators and weighed.

OBJECTIVE ANALYSIS:

TEXTURE ANALYSIS: The principle of texturometer is to deform the sample in a controlled manner and measure its response. Imagine turning a lab balance upside down and pressing the balance pan down into the sample.

The force response of the sample would be shown on the digital display moving up or down depend on how you pushed the balance into the sample.

METHOD:

The texture of the Burfi is evaluated using a TMS Lab pro Texture analyser equipped with a load cell and a fixture table and T-slot mounting base. The force data is recorded with the texture expert software (stable Microsystems) and the texture of each sample is expressed as the max compression force (Newton) when applying a vertical downward movement at the middle of the burfi, referred to as bending force.

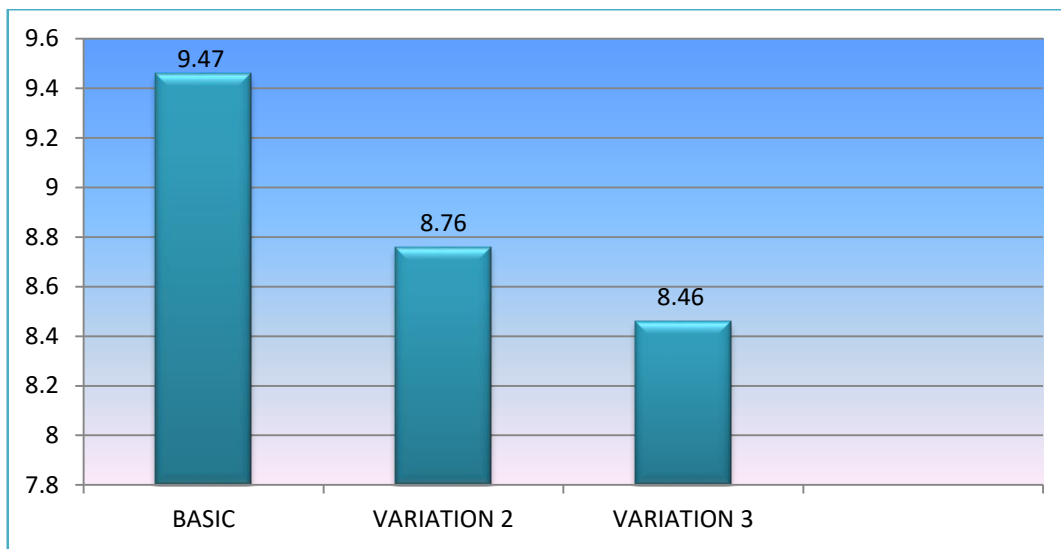
RESULTS AND DISCUSSION:**NUTRIENT ANALYSIS:****COMPARISON OF THE CALCUALTED VALUE AND ANALYSED VALUES OF PROTEIN, FAT AND FIBRE CONTENT OF BASIC AND VARIATIONS OF BURFI:**

SAMPLE :	PROTEIN CONTENT (g):	CALCULATED PROTEIN VALUE(g):	FAT CONTENT (g):	CALCULATED FAT VALUE (g):	FIBRE CONTENT (g):	CALCULATE D FIBRE VALUE(g):
BASIC	9.47	9.93	14.46	18.8	0.06	0.03
VARIATION 2	8.76	9.98	10.65	19.2	0.74	0.51

VARIATION 3	8.46	10.03	9.89	19.4	0.78	0.75
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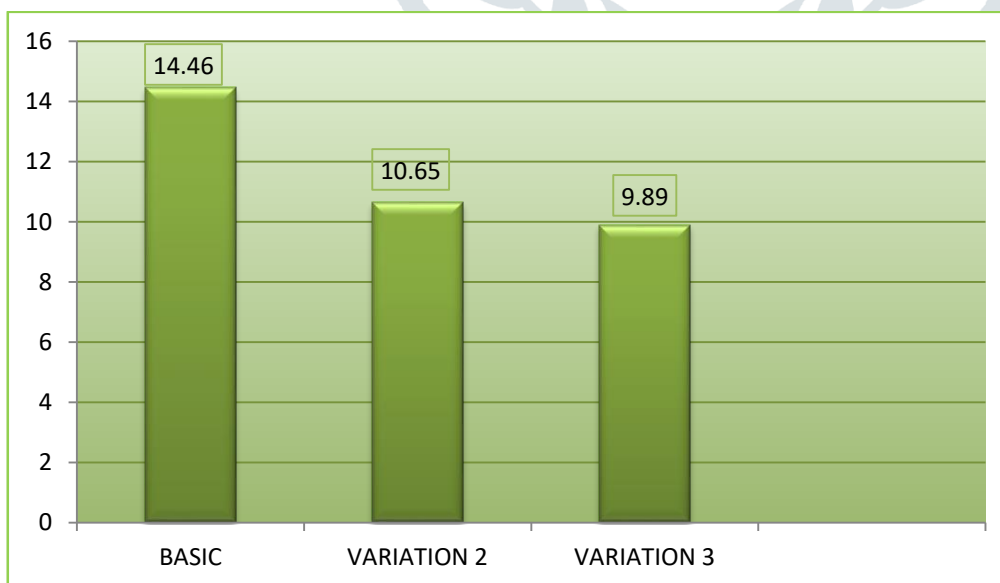
From the above table it is clear that the calculated nutritive value and the analysed nutrient values are almost the same with very little fluctuation.

Nutrient analysis of burfi was done using standard methods to find the protein ,fat and fibre values of the Basic, Variation 2, Variation 3. This Table shows the result of the nutrient analysis, representing the protein, fat and fibre values of the basic and the variations.



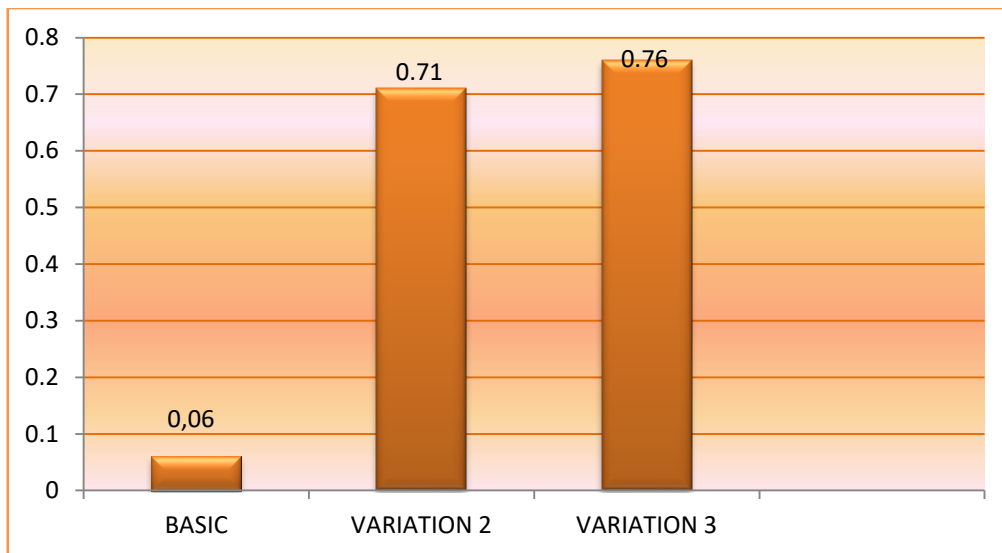
Comparison of Protein content in Basic and the Variations of Burfi.

Figure shows the comparison of the protein value of the basic and variations. The protein value of basic, variation 2 and variation 3 was found to be 9.47 g, 8.76g and 8.46 g respectively. Basic was found to have high protein content.



Comparison of Fat content in Basic and the Variations of Burfi.

. Figure shows the comparison of the fat value of basic and variations. The fat value of basic, variation 2 and variation 3 was found to be 14.46, 10.56g and 9.89g respectively. Basic was found to have high fat content.



Comparison of Fibre content in Basic and the Variations of Burfi.

. Figure shows the comparison of the fibre value of basic and variations. The fat value of basic, variation 2 and variation 3 was found to be 0.06g, 0.71g and 0.71g respectively. Variation 3 was found to have high fibre content.

MOISTURE ANALYSIS:

Moisture was determined according to the procedure given by AOAC (1975) by drying the sample (2g) at 105°C in moisture oven in pre dried and weighed aluminum dishes until constant weight was obtained. The loss in weight of the sample was used to calculate percent moisture.

SAMPLES:	MOISTURE CONTENT:
Basic	25%
Variation 2	14.5%
Variation 3	18%

Illustrates the Percent moisture content (g/100g) of the basic and variations of burfi. It was found to be highest in Basic i.e 25%, followed by 18% in Variation III and least in Variation II i.e 14.5%.

ASH ANALYSIS:

Total ash in the sample was determined according to the method of AOAC (1975). Two-gram sample was charred in predried and weighed porcelain crucible. Charred sample was incinerated in muffle furnace at 500-570°C for 8 hours or till the ash becomes white or grayish white in colour. After ashing porcelain crucibles were removed, allowed to cool in desiccators and weighed. Porcelain crucibles were kept in air oven at 100°C for one hour, cooled and weighed to a constant weight, percent ash was calculated.

SAMPLES:	ASH CONTENT:
Basic	1.6%
Variation I	2%

Variation II	2%
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Illustrates the percent ash content in basic and variations of burfi. The Percent ash(g/100g) was found to be least 1.6% in Basic and highest i.e 2% in both Variation II and III.

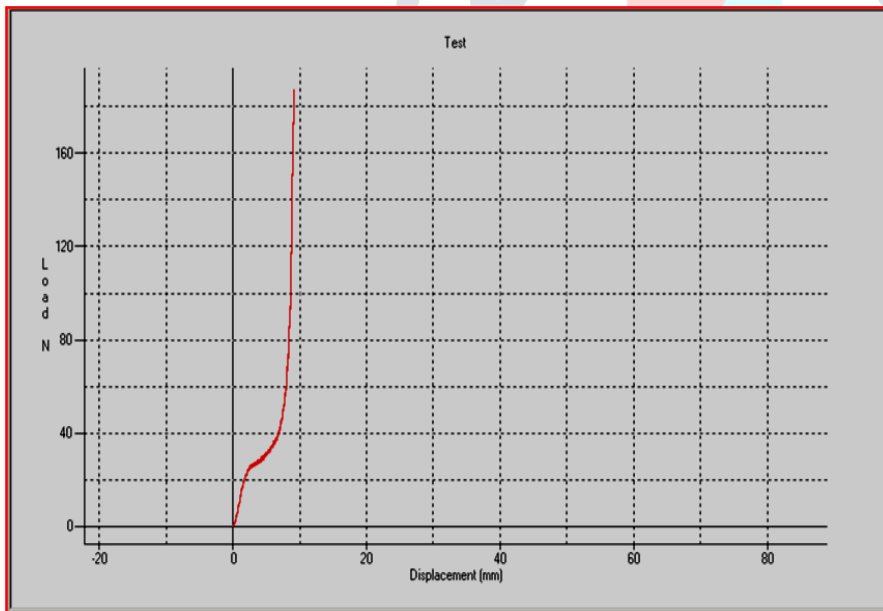
OBJECTIVE ANALYSIS:

COMPARISON OF TEXTURE DIFFERENCE BETWEEN BASIC AND VARIATIONS:

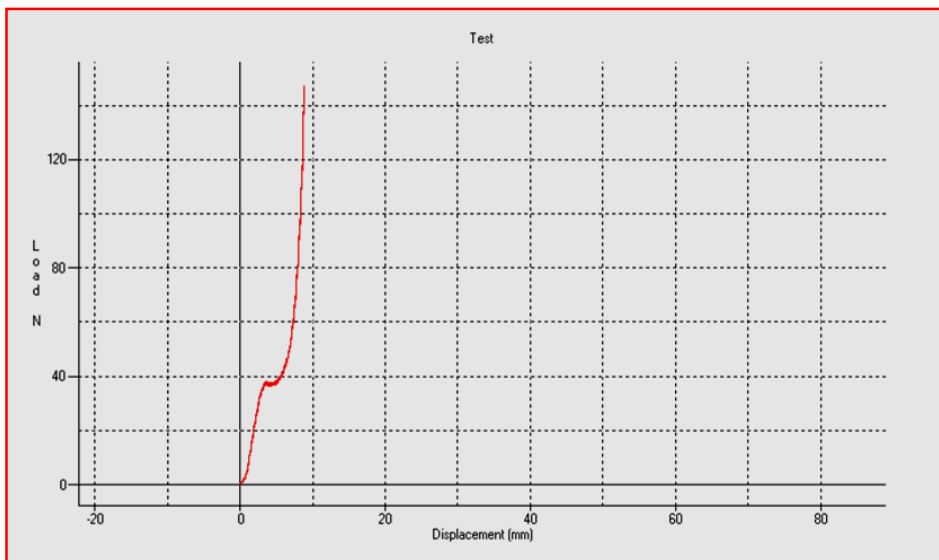
BURFI SAMPLES:	LOAD (N):	DISPLACEMENT(mm):
Basic	40 N	5 mm
Variation II	40 N	5.5mm
Variation III	40N	6mm

Table shows the result of texture analysis of the basic and the variations. It is indicated from the table that, when same force of 40 N is applied to all the three samples, the displacement is 6mm in variation 3 as its texture is firm when compared to other samples. Whereas variation 2 showed less displacement of 5.5 mm and basic showed the least displacement of 5mm because of soft texture.

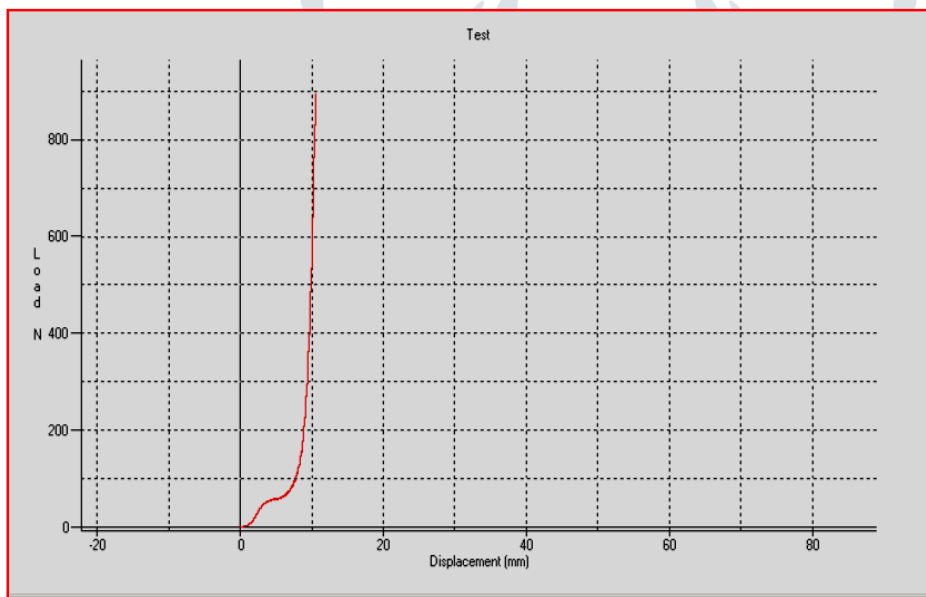
The texture of Burfi was analysed using a Texturometer and the results were obtained in the form of graphs. The graph is plotted by taking Displacement (mm) on x- axis and Load(N) on y- axis.



Illustrates the texture analysis of Basic sample of Burfi, showed displacement at 5mm when 40N force was applied to it.



Illustrates the texture difference in Variation 2 sample of burfi. It showed a displacement of 5.5mm when a force of 40 N is applied to it.



Illustrates the texture difference in Variation 3 sample of burfi. It showed a displacement of 6mm when a force of 40 N is applied to it.

RESULTS AND DISCUSSION

In the present study milk based sweet i.e burfi was prepared, with one basic and four variations. Same method of preparation and temperature was followed for preparing both basic and the variations. All the variations were formulated.

To develop a value added burfi, oats flour was incorporated, whereas the commonly consumed maida burfi was prepared as a basic. By adding known quantities of oats flour in maida, two variations were prepared as the nutrient quality of oats products were higher than others.

Burfi was subjected to nutrient analysis. Protein, fat, fibre, moisture and ash were analysed in the laboratory using standard methods. Protein was estimated using Enhanced Dumas method, fibre was estimated using Fibretherm Gerhardt method and fat was estimated using Soxtherm method. Moisture was analysed using standard AOAC method of oven drying and ash was also

analysed using the standard AOAC method. The estimated values of the basic recipe were 9.47g of protein, 14.46g of fat, 0.74g of fibre, 25% moisture and 1.6% of ash. The estimated values for variation 1 were 8.76g of protein, 10.65g of fat, 0.71g of fibre, 14.5% of moisture and 10% of ash. The estimated values for variation 2 were 8.46g of protein, 9.89g of fat, 0.71g of fibre, 18% of moisture and 10% of ash.

Among the basic and variations, variation II had the highest protein value, variation II had the highest fat value and variation II had highest fibre value.

Burfi was also subjected to texture analysis. Texture analysis was done using a texturometer. The texture meter is available with several interchangeable measurement heads (10 N, 50 N and 100 N), and it can be connected to a computer to plot the graph curves and record the calculated values. A very wide range of penetrators and sensors (cylinders, cones, plates, spheres, needles) are available to deal with the different types of foodstuffs, gels, or paste products to be tested. The speed and displacement values are shown continuously on the console display. The result for the texture analysis of the basic burfi was 40N force at 5mm displacement. For variation 2 the result was 40N force at 5.5mm displacement and for variation 3 the result was 40N force at 6mm displacement. Among all the Basic and Variation samples of burfi, the texture of basic was found to be soft as the breaking strength of basic is less compare to variation 2, and variation 3 required greater breaking strength as its texture was found to be hard.

From the findings of the present investigation it is concluded that the variations enriched burfi was found to be superior to the basic products in terms of nutrient analysis and texture analysis. Therefore the burfi are rich in protein, fat and fiber.

SUGGESTIONS: The present study can be further followed to analyze the micro nutrients of the products which could not be done. It can also be further carried out by clinical assessment, bio-availability and storage studies.

CONCLUSION

From the findings of the present investigation it is concluded that the variations enriched burfi was found to be superior to the basic products in terms of nutrient analysis and texture analysis. Therefore the burfi are rich in protein, fat and fiber. When the samples was subjected to texture analysis, the texture of basic was found to be soft as the breaking strength of basic is less compare to variation 2, and variation 3 required greater breaking strength as its texture was found to be hard

RECOMMENDATIONS

The following recommendations are derived from the current study results.

- The enriched sweets products can be prepared at the household levels as they are cheaper than the market products and are also rich in nutrients.
- They can replace the traditional burfi, as the nutritive quality of the enriched burfi is greater than the traditional burfi.
- These can also be given to underweight people as they contain good amounts of calories as well as protein.
- They can be prepared as a sweet snack item for
 - School going children
 - Adolescents
 - Pregnant women
 - Lactating women

REFERENCES

The survey was done implicating the results and methodology of reference published reports. The referred links are hereby attached.

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