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## Studies on techno economic cupcake fortified with lentil flour

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**Abstract**

Bakery product such as cup cake are gaining population than other process food because of their easy availability ready to eat convenience and comparatively better shelf-life and economically. The lentil flour fortified to standardize the preparation of different value added product. Preparation of cup cake is same method as traditional method of cupcake. We are taken to sample for standardize the recipe like sample "A" as 10% and "B" as 20% fortified lentil flour. After the sensory evaluation 20% lentil flour fortified cupcake have highest acceptability as compare to sample "A" and control sample so 20%. The recipe of cup cake was standardized with 20% fortified lentil flour. The chemical composition of most acceptable 20% Lentil Flour cupcake was having carbohydrate 73%, protein 8.36%, fat 25.48%, fiber 0.15%, moisture 12% etc. To study the shelf life of product on the basis of sensory evaluation, the appearance, color, taste and mouth feel of the cupcake was overall accepted by 9- hedonic Scale. The product accepted by children's and low cost of the product would attract the buyers this paper discuss the preparation of value added cupcake from lentil flour are techno economically viable also rich in nutritional value, to study the shelf life of product by sensory evaluation.

**Keywords:** Lentil flour, nutritional composition, sensory evaluation

**Introduction**

Lentil is also called as finger millets (Lentil) is one of the most nutritious crops among the major cereal crops and belong to family *Gramineae*. It has many applications such as bread, malt, beverages, porridge and roti making. In recent year, finger millet has gained importance because of its nutritional strengths in terms dietary fibers, functional fibers, starch patterns as well as high calcium and iron content the calcium and iron contents in finger millet varieties have been reported to be 220-450 mg and 3-20 mg respectively, (Balakrishna Rao *et al.* 1973)

<sup>[1]</sup> The nutritive value is higher than rice and equal to wheat.

Lentil meal is an ideal for diabetics and obese, because its digestion is slow and due to this the carbohydrates takes longer time to get absorbed, Lentil rich in cellulose there for its regular use in an excellent medicine for chronic constipation. Lentil is excellent tonic for all age groups children also grow healthy strong bones and look rosy due to new blood form by the additional supply of iron its supplies abundant amount of calcium, phosphorous, iron, Vit-B & B2 and prevent malnutrition inspire of restricted food.

Eating of roasted green lentil is a tonic for high blood pressure liver diseases, nervousness, heart, weakness, asthma and during pregnancy. Lentil malt has high nutritional value than whole lentil flour. Lentil is a staple food of a labor class i.e. consumed in form of lentil balls and unleaved bread, roti. Prolong digestion of real meal helps labors toward felling longer tiered and hungry. In lentil phytic acid, tannin and trypsin inhibitor are the main antinutritional factor main present, lentils rich in prolamine and glutamine protein. Lentil is use for reduction of sugar in urine and blood.

Lentils magnesium puts yet another plus in the columns of its beneficial cardiovascular effect. Magnesium is nature's own calcium channel blockers. When enough magnesium around, veins and arteries breathe a sigh of relief and relax, which lessens resistance and improves the flow of blood, oxygen and nutrients throughout the body. In addition to providing slow burning complex carbohydrates, lentils can increase your energy by replenishing your iron stores. Particularly for menstruating women, who are more at risk for iron deficiency, boosting iron stores with lentils is a good idea especially because, unlike red meat, another source of iron, lentils are not rich in fat and calories.

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## Materials and Methods

The present investigation on preparation of cake from lentil was undertaken at Department of Food Processing Technology & Bakery pilot plant of Sau. K.S.K College of Food Technology, Beed. The details of material & method indicated below.

### Materials

The materials required adopted in the present investigation were as follows

### Principle materials for preparation of cake were

Refined wheat flour, Sugar, Hydrogenated veg. oil, Egg, Baking powder, Vanilla essence fortified with lentil flour, all good quality material was purchased from local market of Beed.

### Processing equipments

Baking oven, Weighing balance, Containers, Sieves, Beater these all equipment used in Bakery Pilot Plant of Sau. K.S.K. Collage of Food Technology, Beed.

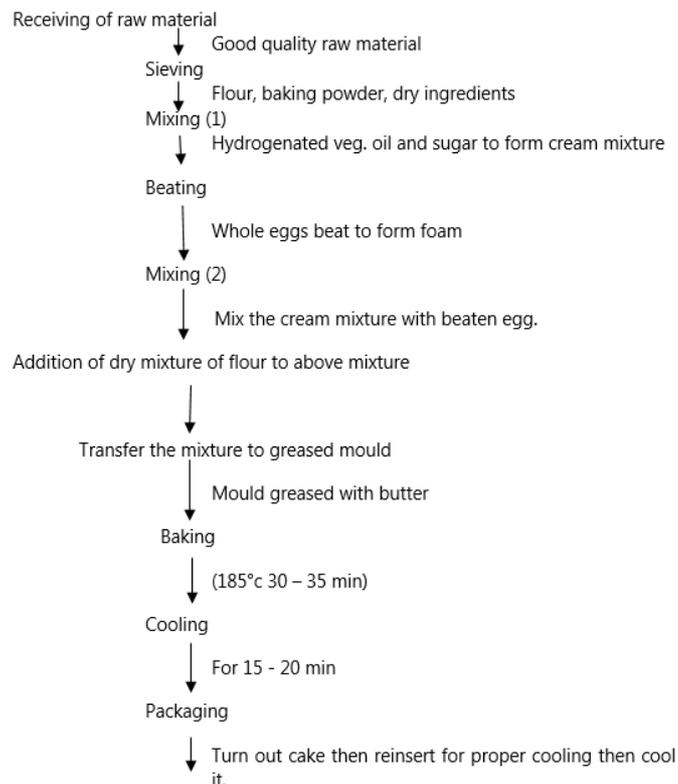
**Table 1:** Formulation of recipe

Ingredients	Control (g)	Sample (A)	Sample (B)
Wheat flour	100	90	80
Lentil	00	10	20
Sugar	60	60	60
Egg	02	02	02
Baking powder	01	01	01
Milk powder	As per requirement		

### Packaging material

The low density polyethylene bags were used for packaging of cake. It was purchased from local market of Beed.

### Method for preparation



(Book Bakery Science and Food Technology by Khetripol.)

## Determination of proximate composition of raw material and fortified cake

### Moisture

Moisture content of Lentil cake was determine by the method given by using Hot Air Oven mrthod described in (A.O.A.C. 2007) [1].

### Ash

Ash content of lentil was determined by using (A. O. A. C. 2007) [1] method.

### Protein

Protein content of lentil cake was estimated by the method given by using Micro kjeldhal aperture and the protein content of cake was determining by the estimating the percent of Nitrogen. (A. O. A. C. 2007) [1]

$$\text{Protein (\%)} = \text{Nitrogen (\%)} * (6.25)$$

### Fat

The fat content of lentil cake was determined by using (A. O. A. C. 2007) [1] methods. By solvent extraction method using Soxhlet Apparatus the ether was evaporated and residues was weighted which represented fat content. Then % value was then calculated

### Crude fiber

Crude fiber was estimated by the using (A. O. A. C. 2007) [1] methods.

### Sensory evaluation

The sensory characteristics if the product such as general appearance, Color, Taste, Texture, and flavour were evaluated by Panel of Judges using 9-Point Hedonic Scale.

## Result and Conclusion

The result of the Present researchers work are tabulated, presented and discussed at the following point:

1. Chemical analysis of refined wheat flour and lentil flour.
2. Chemical analysis of fortified cake
3. Sensory evaluation of fortified cake

**Table 2:** Chemical analysis of lentil flour and wheat flour

Sr. No.	Parameters	Lentil flour (%)	Wheat flour (%)
1	Carbohydrate	56.7	74.5
2	Protein	24.0	13.70
3	Fat	1.3	1.87
4	Moisture	9.3	12.67
5	Fiber	4.1	12.2
6	Ash	2.9	1.7

(Sau K.S.K. C.F.T. Chemistry Lab)

In the above given table no 1 gives the nutritional composition of lentil flour and wheat flour rich in carbohydrate content as 56.7%, 74.5% resp., protein 24.0%, 13.70% resp., fat 1.3%, 1.87% resp. also enrich source of fiber as 4.1%, 12.25 resp. so it was acceptable for the preparation of cake.

**Table 3:** Proximate analysis of Cupcake

Sr. No.	Parameters	Control sample (%)	Sample A (%)	Sample B (%)
1	carbohydrate	74	72.3	73
2	Protein	7.16	7.37	8.36
3	Fat	20.98	22.96	25.48
4	Fiber	0.04	0.14	0.15
5	Moisture	13.00	11.00	12

(Sau K.S.K. C.F.T. Chemistry Lab)

In the above given table no 2 shows the different nutritional composition of control sample, Sample no 1 and Sample B mostly acceptable. The sample B contains carbohydrate 73%, protein 8.3%, fat 25.48%, fiber 0.85%, Moisture 12%.

**Sensory evaluation of lentil cake**

Sensory evaluation of any consumable product is the best method of judging the acceptability of product by consumers. The assessment was done by studying the characteristics like color, appearance, taste and flavor of the product by the panel of judges.

**Table 4:** Sensory evaluation of lentil cake

Sr. no.	Sample code	Appearance	Color	Flavour	Taste	Texture	Mouth Feel	OAA
1	Control sample	7.8	8.1	7.9	7.7	7.5	7.4	7.73
2	Sample A	6.5	6.6	6.8	6.9	6.3	6.5	6.6
3	Sample B	7.1	7.4	7.2	7.4	7.1	7.3	7.2

(K.S.K. C.F.T. Staff)

Table no 3 shows that the shelf life on the basis of Sensory evolution by 9-Hedonic scale for these cupcake was performed and Sample B done for preparation of Cupcake. Above the table showed Sample B given moderate rank of Cupcake as compare other by panel of judges.

**Conclusion**

Bakery products such as cupcakes are gaining population as compare to other processed foods because of there is easy availability, convenience and comparatively better shelf life and economical. The recipe for cupcake was formulated by the varying the lentil flour (10% and 20%) and It was standardized by the sensory evaluation of this formulated cupcake.

The data obtained in the investigation are enough to draw the conclusion that cupcake can be prepared by using lentil flour. The cupcake prepared by replacing (80% white wheat flour and 20% lentil flour). This prepared cupcake have improved chemical composition with respect to fiber, fat content and protein content without sensory and textural attributes. hence it is finally conclude that development processing technology for the preparation of value added products from lentil are techno economically viable which will give more remunerable returns to grouses and also beneficial to consumer with regard to nutritional value to products. The technology for the preparation of cupcake from lentil on commercial scale may open new avenues for better marketing.

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