



## DEVELOPMENT OF COMPOSITE FLOUR MATERIAL FOR BAKERY PRODUCT

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### Abstract

Sorghum is a health food without gluten, high in polyphenols & antioxidants. It is an important staple food & it has been utilized for human consumption in porridges, beer, unleavened bread, composite blends & ethnic beverage. In the present study efforts have been made to develop sorghum flour based functional biscuit by incorporation of finger millet & maida flour & effect of processing on their nutritional quality.

Biscuit samples were prepared with 30 % sorghum flour, 5% finger millet, 65 % maida flour & 5 % skim milk powder. On the basis of proximate analysis, it was concluded that malting at 72 hours is most effective process to increase the nutritional & sensory quality same as that of biscuits.

*Key words : Composite Flour , Bakery product, biscuit, sorghum, finger millet*

### Introduction

Sorghum *Bicolor (L) Moench* originated between 4500 & 1000 BC in part of central Africa & subsequently spreading to Asia & India (*Schober & Bean, 2008* ) *Zakari et al (2011)* reported the use of whole wheat & soyabean flour blend for functional breads. *Udachan et al (2003)* used four local Indian varieties of sorghum CSH-9, CSH-5, Dadar & Parbhani for proximate analysis & starch Characterization.

In India 80 % of the population lives in villages & their staple food is 'Jowar' grains & mainly used as human food in the form of *Roti, Bhakari* or for making *Soji*. In Africa sorghum is used as *porridge, gruel & parched, popped or malted grain*. A blend of wheat & sorghum flour backed products like muffins, bread & cakes can be produced. In the developed countries sorghum is used as feed for live stock (*Shrivastawa Sarita et al 1996*).



Jowar protein is deficient in amino acids lysine, methionine & cystine. The combination of cereal & legume protein is complementary to each other & gives better nutritional value. Most of the studies in this field were supported by the FAO. Replacement of wheat flour with non wheat flour (e.g. millet) increases protein quality by improving its amino acid profiles (*Subir kumar & Pravesh Yadav 2010*). Biscuits are ready to eats, cheap & convenient food product that is consumed amongs all age groups in many countries (*Hussein etal 2006*) & source of protein & minerals(*Kure etal 1998*)

### **Method**

Standard procedures given in *Ranganna etal (1996)* were used for analytical determination such as *Ash, moisture , proteins, crude fat, crude fibre etc.*

Formulation of biscuit (gm) :-

The formulations of biscuit prepared from different proportions of raw, sorghum flour and finger millet flour are ginven in table. Other ingredients like sorghum flour (30 g) , wheat refined flour (65g), vanaspati ghee (65g), and sugar (40), baking powder (1g), Skim Milk Powder (10g), and vanilla essence (1.5ml) were added to each of these formulations of biscuit preparation. Biscuit samples were prepared by following procedure suggested by (*Singh et al., 2006*).

**Table No.1 : Details of Treatments – (Flour compositions of Biscuit)**

| Treatment (Batch) | Sorghum | Maida | TOTAL |
|-------------------|---------|-------|-------|
| T1 (g)            | 10      | 85    | 100   |
| T2 (g)            | 20      | 75    | 100   |
| T3 (g)            | 30      | 65    | 100   |
| T4 (g)            | 0       | 100   | 100   |

**Table No.2 : Ingredients to be used for 100 g flour**

| Sr. No. | Name                 | Quantity |
|---------|----------------------|----------|
| 1       | Dalda (g)            | 65       |
| 2       | Sugar (g)            | 40       |
| 3       | Milk Powder (g)      | 10       |
| 4       | Baking Powder (g)    | 1        |
| 5       | Vanilla Essence (ml) | 1.5      |

**Results**

Table No.3 : Chemical Composition Flour

| Ingredient  | Maida Flour | Finger Millet Flour | Sorghum Flour | Composite Flour |
|-------------|-------------|---------------------|---------------|-----------------|
| Parameter   | (%)         | (%)                 | (%)           | (%)             |
| Moisture    | 13-13.5     | 0.75                | 11.04         | 2.81            |
| Ash         | 05.- 0.55   | 1.55                | 2.32          | 0.91            |
| Protein     | 10.33       | 5.8 – 12.8          | 9.12          | 14.00           |
| Crude Fiber | 2.5 – 3     | 3.5 – 3.9           | 1.77          | 1.88            |
| Fat         | 2.77        | 1.3 – 2.7           | 3.59          | 24.15           |

Table No.4 : Chemical Composition of Biscuit Product

| Parameter     | T1    | T2    | T3    | T4    |
|---------------|-------|-------|-------|-------|
| Moisture %    | 0.12  | 1.60  | 2.81  | 1.3   |
| Ash %         | 0.98  | 0.99  | 0.984 | 1.07  |
| Protein %     | 14.14 | 13.89 | 14.00 | 9.03  |
| Fat %         | 23.64 | 24.07 | 24.15 | 25.04 |
| Crude Fibre % | 1.72  | 1.93  | 1.88  | 1.20  |

Table No. 5 : Organoleptic Attributes of Biscuit

| Sample Code | Appearance | Color | Flavour | Crispiness | Smell | Sweetness | Taste | Overall liking |
|-------------|------------|-------|---------|------------|-------|-----------|-------|----------------|
| T1          | 7          | 8     | 8       | 7          | 6     | 8         | 8     | 7              |
| T2          | 9          | 8     | 8       | 7          | 7     | 8         | 7     | 8              |
| T3          | 9          | 8     | 9       | 8          | 9     | 9         | 8     | 9              |
| T4          | 7          | 7     | 8       | 8          | 9     | 8         | 7     | 8              |
| SE          | 0.53       | 0.3   | 0.5     | 0.55       | 0.6   | 0.26      | 0.53  | 0.58           |
| CD          | 0.67       | 0.57  | 0.69    | 0.78       | 0.89  | 0.58      | 0.67  | 0.70           |

### Discussion

Proximate analysis of raw flour showed that moisture content of Jowar decreased while Ash increased. The chemical composition of Biscuit revealed that there was little change in fat content due to blanching but decreased by malting. Protein, fiber, fat, minerals of biscuit (T3) was increased due to addition of malted finger millet flour to Jowar flour, which was beneficial (*singh et al 2006*). Sample T3 & T4 had no significant difference.

### Conclusion

Thus incorporation of Jowar flour and finger millet flour added with baking fat & milk powder improved nutritional & dough textural characteristics of biscuit along with sensory attributes and overall liking of the sample T3 was higher than other samples.



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