Preparation and Sensory Evaluation of Finger Millet Khakhra

Pasumarthi Giridhar*

Department of Chemical Engineering, Vignan’s University, Andhra Pradesh, India

*Corresponding Author: Pasumarthi Giridhar, Department of Chemical Engineering, Vignan’s University, Andhra Pradesh, India, E-mail: giridharpasumarthi9@gmail.com

Received: 08 March 2019; Accepted: 20 March 2019; Published: 21 March 2019

Abstract
Khakhra is a crispy version of roti, it is usually a cracker that is handmade and roasted to provide crunchiness. It is also a healthy snack which is a common recipe in the Rajasthani and Gujarati cuisines. Khakhra when prepared by using finger millet as a major ingredient provides a much more nutrition in terms of protein, carbohydrates, minerals and dietary fibers in comparison with the traditional khakhra that is made of wheat flour. Since over consumption of wheat or its products are known for improper health condition such as celiac disorder may overcome by substituting it with ragi or finger millet which is rich in several minerals such as calcium and iron. Finally obtained product is kept for sensory evaluation by using nine point hedonic scale.

Keywords: Finger Millet flour; Sensory Evaluation; Traditional Recipe; Nutritional value

1. Introduction
The food is part of man’s culture and is filled with different meanings and symbolism for different age groups. The food should be nutritious, attractive in appearance and must satisfy customer demand in terms of quality to be eaten and enjoyed. Finger millets are the valued product for humankind. Finger millets contain protein (5-8%), carbohydrates (65-67%), dietary fiber and minerals (2.5-3.5%) and it has highest calcium content among all the cereals. In the recent years, there is growing regarding the nutritive value of food and to nourish the ever-increasing population, however the inadequacy of essential nutrients can be improved through the fortifications and enrichment. A balance of nutrients may be obtained by including cereals, pulses, milk and milk products. Such diet involves carbohydrates, proteins, minerals, dietary fiber. The modified khakhra is a nutritive enhanced product, whose sensory characteristics are studied further.

2. Materials and Methods
For preparation process of finger millet khakhra, following mixture of the finger millet flour and the wheat flour is
considered as the major ingredient,

$T_0$ 100% wheat flour by weight (control)

$T_1$ 10% finger millet flour+90% wheat flour by weight

$T_2$ 15% finger millet flour+85% wheat flour by weight

$T_3$ 20% finger millet flour+80% wheat flour by weight.

### 2.1 Processing of finger millet powder

![Diagram of finger millet processing](image1)

**Figure 1:** Processing of finger millet powder.

### 2.2 Preparation flow diagram for the preparation of finger millet khakhra

![Diagram of finger millet khakhra preparation](image2)

**Figure 2:** Preparation of finger millet khakhra.

- Khakhra is safer and less prone to microbial spoilage.
- It has low moisture content in the product.
- Also possess a longer shelf life.

### 3. Results and Discussion

Finger millet khakhra prepared from different mixtures of wheat flour and finger millet flour is subjected to sensory evaluation and scores are recorded for different parameters are presented in Table1.
<table>
<thead>
<tr>
<th>Treatments</th>
<th>Color and Appearance</th>
<th>Flavor</th>
<th>Consistency</th>
<th>Mouth feel</th>
<th>Overall Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>8.02</td>
<td>8.15</td>
<td>8.35</td>
<td>8.01</td>
<td>8.12</td>
</tr>
<tr>
<td>T₁</td>
<td>8.2</td>
<td>8.32</td>
<td>8.66</td>
<td>8.23</td>
<td>8.20</td>
</tr>
<tr>
<td>T₂</td>
<td>8.12</td>
<td>8.23</td>
<td>8.28</td>
<td>8.12</td>
<td>8.14</td>
</tr>
<tr>
<td>T₃</td>
<td>8.10</td>
<td>8.12</td>
<td>7.20</td>
<td>8.01</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Table 1: Sensory evaluation of four fingers millet khakhra.

3.1 Color and appearance
The mean color and appearance score for different treatments of finger millet khakhra are ranged from 8.02 to 8.12. The treatment T₁ (8.12) is found to be significantly superior over the rest of the treatments. It was observed that an increase in the level of finger millet flour in khakhra decreases the score of color and appearance slightly [1-3].

3.2 Flavor
It is observed that the mean score for the flavor of finger millet khakhra for treatments T₀, T₁, T₂ and T₃ are 8.15, 8.32, 8.23, and 8.12 respectively. The treatment T₁ is superior over T₀ and T₂ treatments. It is observed from above findings that 90% of wheat flour mixed with 10% of finger millet flour will give rich flavor to khakhra.

3.3 Consistency
The mean score for the consistency attributes of finger millet khakhra ranges from 7.20 to 8.66. The treatment T₁ (8.66) is significantly superior over the rest of the treatments.

3.4 Mouth feel
The highest mouth feel score is observed for treatment T₁ (8.23) followed by T₂ (8.12), T₀ (8.01) and T₃ (8.0). 10% of finger millet flour mix is most acceptable (T₁).

3.5 Overall acceptability
The mean score for treatment T₀, T₁, T₂ and T₃ are 8.12, 8.20, 8.14 and 8.0 respectively. The treatment T₁ (8.12), T₂ (8.20), and T₀ (8.12) ranked among like very much to like extremely. The treatment T₁ (8.12) is most accepted by the judges. So use of 10% of finger millet flour is more acceptable than the other treatment combinations [4-5].

4. Conclusion
Addition of finger millet flour into traditional khakhra makes is more nutritious and also helps in improving the keeping quality of the end product. The optimum amount of finger millet flour that can be used in the process of preparation of khakhra is up to 10%.

References


This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license 4.0.