

DEVELOPMENT AND STANDARDISATION OF FORMULATED BAKED PRODUCTS USING MILLETS

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ABSTRACT

Milletts are major food sources for millions of people, especially those who live in hot and dry areas of the world. There are many varieties of millets. Millets are unique among the cereals because of their richness in calcium, dietary fibre, polyphenols and protein. It is a gluten-free cereal grain, an excellent source for people suffering from celiac diseases and also rich in phytochemical which helps to lower cholesterol level and reduced cancer risk due to its phytate content. The major millets were procured from the local market. The present study was to develop and popularize bakery products using millets. The millets were cleaned, dried under the sun, milled into flour. Popular bakery products such as biscuits, cakes and cookies were developed using foxtail millet, finger millet, proso millet and pearl millet added with wheat flour in the ratios of 10:90, 20:80 and 30:70 for both biscuit and cake, whereas for cookies, the above flours were used in the ratios of 15:85, 20:80 and 25:75, respectively. Sensory evaluation indicated that the combinations of all the three levels were well acceptable for the three products. Results suggested that all types of major millet flours can successfully be incorporated for the development of various bakery products to benefit consumers and the importance of using millets could be instilled by introducing them in government food programmes like the mid day meal scheme and they could be included to enhance food security.

KEYWORDS: Millet, Rain-Fed Crops

INTRODUCTION

Milletts are one of the oldest foods known to humans and possibly the first cereal grain to be used for domestic purposes. Millets are small-seeded grasses that are hardy and grow well in dry zones as rain-fed crops, under marginal conditions of soil fertility and moisture. Millets share a set of characteristics which make them unique amongst cereals. Millets grow under dry conditions, can cope with relatively poor soils and require few external inputs. They are a staple food with superior nutritional qualities compared to other cereals. India is the biggest producer of millets in the world and millets remain a staple crop for numerous households. When properly stored, whole millets will keep for two or more years. Baked products are foods mainly based on cereal flours which are blended with other ingredients. Millet protein lacks gluten, hence it is unsuitable as the sole material for preparation of bakery products.

OBJECTIVES OF THE STUDY

The following ideas are the specific objectives of the study

- To develop and standardize the recipes using millets

- To popularize the baked products using millets

MATERIALS AND METHODS

Collection of the Samples

The major millets such as foxtail millet and pearl millet was procured from the local departmental stores. The millets were cleaned, washed and sundried, milled into flour.

Development and Standardization of Recipes

Recipes were developed using foxtail millet and pearl millet. Various baked products such as cake, biscuits and cookies were prepared and standardized. The millets flour was mixed with wheat flour in the ratio of 10:90, 20:80, and 30:70. The selected recipes were standardized by basic standard procedures. Standardized recipes as one that has been tried, adapted and retrieved several times for use by a given food service operation and has been found to produce the same good results and yield every time when the exact procedure are use, with the same type of equipment and same quantity and quality of ingredient in the manual.

Sensory Evaluation

The sensory acceptability of developed recipes was determined by a five point hedonic scale for attributes like appearance, colour, flavor, texture and taste. The developed recipes were evaluated by trained panel members. The panel was given an evaluation form developed by the investigator to assess the recipe on the various attributes so that the degree of acceptability of the product can be easily judged.

Nutrient Analysis

Nutrients are substances derived from food during the process of digestion. The nutrients such as energy, protein, carbohydrate, fat, fiber, and iron were calculated for each recipe.

Shelf Life Study

Shelf life of a food is defined as the time taken it takes for a product to decline to an unacceptable level. The actual length of the shelf life of any given product will depend on a number of factors such as processing method, packaging and storage conditions. The foxtail millet and pearl millet incorporated products were kept in an air tight container at room temperature. It was observed daily and the time take for the product to decline to an unacceptable form was found out.

Statistical Analysis

The data collected was statistically analyzed.

RESULTS AND DISCUSSIONS

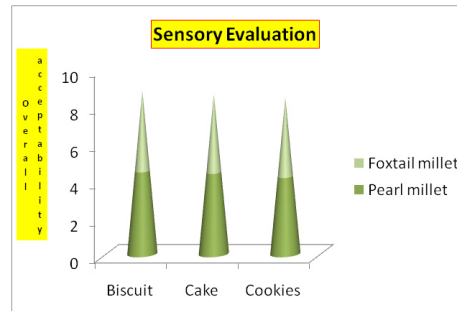


Figure 1: Sensory Evaluation of the Developed Recipes

The figure 1 reveal that Biscuit, Cake and Cookies prepared by incorporating foxtail millet and pearl millet at a variation of 10 percent, 20 percent and 30 percent, out of which variation 20 percent and variation 30 percent were very good in appearance, texture, taste, colour and flavor. Biscuits, Cakes and Cookies made from pearl millet were highly acceptable than foxtail millet.

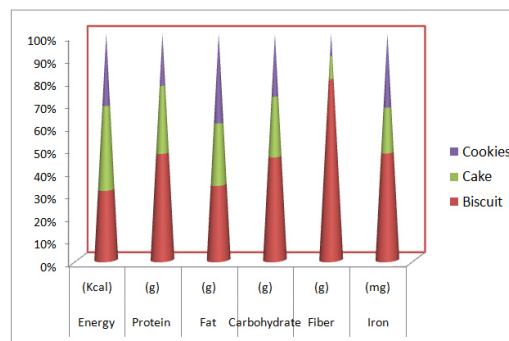


Figure 2: Nutrient Composition of the Recipes Prepared with Pearl Millets

The figure 2 shows that nutrients show a higher variation with incorporation of pearl millet. The fiber content was found to be higher in biscuit and energy content was increased with the addition of every 30g of pearl millet. The iron content was found to be increased with addition of every 10g of pearl millet in biscuit.

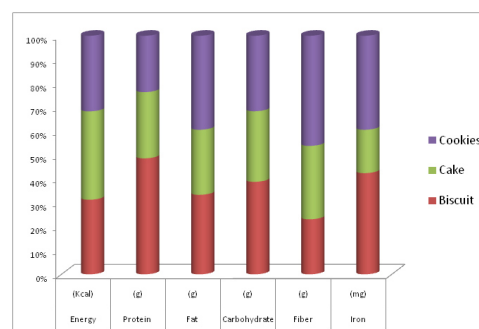


Figure 3: Nutrient Composition of the Recipes Prepared with Foxtail Millets

The figure 3 shows that protein, carbohydrate, and iron content of cookies and biscuits was increased with the addition of every 20g and 30g of foxtail millet. Calorie content was high in cake as compared with other nutrients.

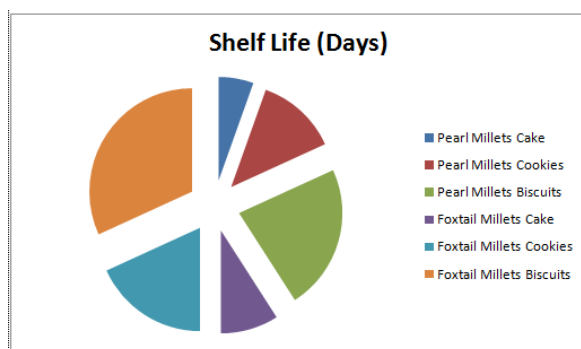


Figure 4: Shelf Life of the Products Developed with Millets

The figure 4 indicates that foxtail millet exhibits good storage stability. Pearl millet has high amount of moisture and sugar content compared to as foxtail millet, so pearl millet has less shelf life than foxtail millet.

Table 1: Mean Score of the Developed Recipes

Recipes	Pearl Millet Mean \pm SD	Foxtail Millet Mean \pm SD	't' value
Biscuit	3.92 \pm 0.30	4.14 \pm 0.13	1.326
Cake	4.44 \pm 0.089	3.98 \pm 0.130	5.81*
Cookies	4.34 \pm 0.114	4.24 \pm 0.151	1.04

*Significant at 5 %, ns- not significant.

It was observed from the table that there is a significant difference only in cake between the two millet flours.

CONCLUSIONS

It was concluded that development and standardization of baked product recipes using millets can be popularized and can replace instead of using refined flour. Can be instilled by introducing them in government food programmes like the mid day meal scheme. All types of small millet flours can successfully be incorporated for the development of various baked products to benefit consumers. Developed baked products stored in an air tight zip lock plastic bag at room temperature exhibits a good storage stability especially the foxtail millet while pearl millet has less shelf life due to high amount of moisture content.

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