



Short Communication

Development of value Added Bakery Products using Soy Milk

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Abstract

Nutrient analysis is the science of judging the quality as well as the quantity of nutrients present in the food. Specific analysis may be carried out for essential nutrients such as energy, protein, fat, carbohydrate, vitamins and minerals. The present study aims at analyzing the nutritional value of bakery products such as bread, biscuits and cakes by the addition of soymilk. The best accepted soymilk fortified experimental samples of each categories was found out from the organoleptic evaluation, and analysed for their nutrient content. Results show that there is a noticeable increase in nutritional value of bakery products, due to the addition of soymilk, which has become popular among the students.

Keywords: Bakery products, fortification of soymilk, nutritional value.

Introduction

Soymilk is an excellent economic source of nutrient and the cheapest source of protein for rural households in a nutritional and economic comparative analysis when compared with other major sources of proteins like eggs, beef, milk and cowpea¹. Soymilk is a good source of many required vitamins and minerals. The nutritional value of soymilk is roughly equivalent to that of animal protein of high biological value². So, in the preparation of bakery items, soymilk was incorporated due to its, high nutritional value, and analysed for their nutritional value.

Material and Methods

In the present study soymilk is used as an effective fortificant, in the preparation of bakery items. The composition of standard and experimental samples and the level of soy milk is given in table 1 and 2. The best accepted recipes of each categories were selected for nutrient evaluation, along with their standard samples.

Selection of taste panel : Women in the age group of 20-25 years were selected as taste panelist for conducting organoleptic evaluation. From the organoleptic evaluation, the following recipes were selected for nutrient evaluation along with their standard samples. The results are discussed elsewhere.

Bread (Sample A): In bread, sample A₁ is considered as the best sample and it posses high mean ratio for all sensory criteria, which was prepared using 100 ml of soymilk.

Biscuits (Sample B): Experimental sample B₂ with 125ml of soymilk, showed best acceptance.

Cake (Sample C): Experimental sample C₂ posses highest mean ratio .

The nutrient analyses were done as per the following procedures.

Estimation of Energy: Analytical methods using calorimeter is followed for the estimation of Energy.

Estimation of Protein: Protein content of the bakery items were estimated by Biuret method³.

Estimation of Fat: The concentration of fat was calculated from Reichert – Meissl – Wolleny value (R).

Estimation of Carbohydrates: The total carbohydrate content of the various bakery products were estimated as per Duke⁴.

Estimation of Calcium: The calcium content of the bakery products were determined as per Breeze⁵.

Estimation of total and Ionizable Iron: The total and ionizable iron content of the bakery products were estimated by Spectrophotometric and radioisotopic methods respectively.

Moisture Content: The moisture content of a food is determined by using calorimetric method.

Results and Discussion

Nutrient composition of most acceptable soymilk fortified experimental samples are presented in the tables 3, 4 and 5.

Table-1
Composition of Standard Samples and soymilk fortified Bakery products

| Items | Maida | Salt | Sugar | Butter | Yeast | Water | Preservatives | Baking powder |
|---------|-------|------|-------|--------|-------|--------|-----------------|---------------|
| Bread | 500 g | 10 g | 20 g | 10 g | 7 g | 300 ml | Sugar & Vinegar | - |
| Biscuit | 100 g | 10 g | 80 g | 60 g | - | 200 ml | Sugar & Vinegar | 1/4 tsp. |
| Cake | 250 g | 10 g | 250 g | 250 g | - | 250 ml | Sugar & Vinegar | 2 tsp. |

Table-2
Composition of Experimental Samples

| S. No | Bakery products samples (Bread, Biscuits and cake) | Amount of soymilk used (ml) | Amount of class one preservatives | |
|-------|--|-----------------------------|-----------------------------------|--------------|
| | | | Sugar (g) | Vinegar (ml) |
| I | Standard Sample A (Bread) | - | - | - |
| 1. | Experimental Sample A ₁ | 100 | 50 | 2 |
| 2. | Experimental Sample A ₂ | 150 | 50 | 2 |
| 3. | Experimental Sample A ₃ | 200 | 50 | 2 |
| 4. | Experimental Sample A ₄ | 250 | 50 | 2 |
| 5. | Experimental Sample A ₅ | 300 | 50 | 2 |
| II | Standard Sample B (Biscuit) | - | - | - |
| 1. | Experimental Sample B ₁ | 100 | 50 | 2 |
| 2. | Experimental Sample B ₂ | 125 | 50 | 2 |
| 3. | Experimental Sample B ₃ | 150 | 50 | 2 |
| 4. | Experimental Sample B ₄ | 175 | 50 | 2 |
| 5. | Experimental Sample B ₅ | 200 | 50 | 2 |
| III | Standard Sample C (Cake) | - | - | - |
| 1. | Experimental Sample C ₁ | 100 | 50 | 2 |
| 2. | Experimental Sample C ₂ | 120 | 50 | 2 |
| 3. | Experimental Sample C ₃ | 130 | 50 | 2 |
| 4. | Experimental Sample C ₄ | 140 | 50 | 2 |
| 5. | Experimental Sample C ₅ | 150 | 50 | 2 |

Table-3
Nutritional value of Bread samples

| | Energy (Kcals) | Protein (g) | Fat (g) | CHO (g) | Fe (mg) | Calcium (mg) | Moisture (g) |
|------------------------------------|----------------|-------------|---------|---------|---------|--------------|--------------|
| Control Sample A | 324 | 7.0 | 3.0 | 64.1 | 4.0 | 0.021 | 25.0 |
| Experimental Sample A ₁ | 331 | 7.2 | 5.2 | 60.4 | 4.12 | 0.025 | 25.2 |

The above table – 3 shows the nutrient composition of bread of control sample A and experimental sample A₁. The calorific value of control sample A is 324 Kcals, whereas it was slightly increased in the experimental sample A₁ protein and fat content of experimental sample A₁ is about 7.0 g and 5.2 g respectively. It was slightly higher than control sample A. This may be due to the addition of soymilk. Carbohydrate content of control sample A is about 64.1 g whereas the carbohydrate content was reduced in the experimental sample A₁ (60.4 g). The iron content of control sample A is about 4.0 mg whereas it was increased in the experimental sample A₁ about 4.1 mg. There is

not much noticeable difference in the calcium and moisture content between the standard and experimental sample.

From table 4 it is known that, there is increase in energy, Protein, fat as well as ash content in the experimental sample B₂. There is slight difference noticed in calcium and moisture between the standard sample B and experimental sample B₂. Carbohydrate content of control sample B is about 62.3 g whereas it was slightly lesser in the experimental sample B₂ 61.2 g. The iron content has increased from 4.3 mg to 4.36 mg in the experimental sample.

Table-4
Nutritional value of Biscuits

| | Energy (K.cal) | Protein (g) | Fat (g) | CHO (g) | Fe (mg) | Calcium (mg) | Moisture (g) |
|------------------------------------|----------------|-------------|---------|---------|---------|--------------|--------------|
| Control Sample B | 328 | 7.1 | 4.8 | 62.3 | 4.3 | 0.025 | 25.7 |
| Experimental Sample B ₂ | 335 | 7.5 | 5.6 | 61.2 | 4.36 | 0.027 | 26.1 |

Table-5
Nutritional Value of Cakes

| | Energy (Kcals) | Protein (g) | Fat (g) | CHO (g) | Fe (mg) | Calcium (mg) | Moisture (g) |
|------------------------------------|----------------|-------------|---------|---------|---------|--------------|--------------|
| Control Sample C | 320 | 6.85 | 4.79 | 61.3 | 4.4 | 0.028 | 25.2 |
| Experimental Sample C ₂ | 330 | 7.0 | 5.2 | 60.1 | 4.42 | 0.024 | 25.27 |

In cake, the proportion of soymilk incorporated was about 120 ml in the preparation of experimental sample C₂. Nutrient composition values show that there is increase in energy, protein and fat content in the experimental sample than standard sample. Experimental sample posses high moisture value as 25.27 g, than that of standard sample 25.2 g. carbohydrate content of control sample C is about 61.3 g whereas the carbohydrate content was mildly reduced in the experimental sample 60.1 g. The iron content of control sample is about 4.4 mg whereas it had increased in the experimental sample to 4.42 mg.

Conclusion

Food safety is a global challenge to meet the requirements of hygienic and nutritional qualities⁶. Organoleptic and nutritional evaluation of food quality should achieve aesthetic appeal with food laws and environmental safety regulation.

Soy a versatile bean used mostly in Asia is found in foods like soymilk, soysauce, tempeh, miso and tofu. Whole soy foods are a great source of protein and contain fat 19.5 grams and carbohydrates 21 grams per 100 grams. Other nutrients such as fiber, B – vitamins and omega – 3 – fatty acids are present in soy foods⁷.

Soymilk in powdered or liquid form is included in beverages, smoothies, cultured soy, frozen desserts, puddings, non – dairy creamers and sauces and gravies. Spray dried soymilk contains 54 percent protein and 16 percent fat. Spray dried soymilk has a shelf life of 18 months. Liquid soymilk contains 54 percent protein and 16 percent fat⁸.

Hence, the present showed that fortification has increased the Soymilk the nutritional quality of food items therefore it serves as an effective fortificant in the preparation of bakery items.

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