



Utilization of Fenugreek (*Trigonella foenum-graecum* Linn) to Develop Value Added Biscuits and Breads

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Abstract

Flour of germinated fenugreek supplemented at 5, 10, and 15% levels with wheat flour was assessed for the production of bread and biscuit to improve its nutritional profile. Germinated fenugreek flour samples had 29.89% crude protein, 7.91% crude fat, 11.35% crude fiber and 2.94% ash on dry weight basis. The wet gluten, falling number, and water activity of wheat flour reduced on incorporation of germinated fenugreek flour; while the foaming capacity, water and oil absorption increased for bread and biscuit blended flours. The farinograph water absorption values were 66.3, 63.9 and, 61.8%, while the dough stability values were 7.0, 9.0 and 10.5 min at 5,10 and 15% supplementation levels, respectively. The dough development times were 4.5, 6.1 and 7.5 min and farinograph quality numbers were 76, 100 and 123 brabender units, respectively. The microbiological analysis result of value added products for coliforms, *E.coli* and yeast was revealed absent, and TPC and mould counts were found lower than control. The nutritive values in terms of protein, fiber, ash as well as calcium, magnesium, iron and zinc content of bread and biscuit increased as a result of the supplementation of germinated fenugreek flour to wheat flour.

Methods

Preparation of fenugreek flour: Cleaned fenugreek seeds were soaked in potable water for 24 h at room temperature with a seeds: water ratio of 1:5 (w/v). The unimpeded water was discarded and the soaked seeds were rinsed twice by boiled cooled water to avoid post contamination during germination. The soaked seeds were germinated in plastic sieves covered with sterilized cloth for 72 h at room temperature with frequent watering. The germinated fenugreek seeds were dried in a drying oven at 60°C for 24 h (Shalini & Sudesh, 2004) and ground to pass through 710 micron sieve to obtain fine powder.

Blend formulation: In order to use germinated fenugreek flour (GFF) for the production of bakery products, mixtures of different proportions of these flour with wheat flours need to be evaluated to keep the quality of the product. To observe the substitution limit for the wheat flour (WF) in bakery products, levels of 5%, 10% and 15% of GFF were used in breads and biscuits. These formulations were compared to a standard formulation (100% WF).

Results

Table 1. Physical characteristics of fenugreek based biscuits

FF:WF	Width(diameter) , D(mm)	Thickness, T(mm)	Spread Ratio (D/T)
Control	66.40 ± 0.10 ^a	6.71 ± 0.05 ^d	98.95 ± 2.0 ^a
5:95	65.47 ± 0.06 ^b	7.10 ± 0.06 ^c	92.21 ± 1.00 ^b
10:90	65.00 ± 0.00 ^c	7.84 ± 0.12 ^b	82.90 ± 0.01 ^c
15:85	64.40 ± 0.14 ^d	8.64 ± 0.01 ^a	74.54 ± 0.12 ^d

Different letters in the same column are significantly different at 5% of probability

Table 2: Physical characteristics of fenugreek supplemented breads

Bread samples	Loaf volume (ml)	Loaf weight (g)	Specific loaf volume (ml/g)
Control	428.00 ± 2.00 ^a	86.66 ± 0.14 ^a	4.94 ± 0.03 ^a
5:95	408.33 ± 2.08 ^b	90.98 ± 0.77 ^b	4.49 ± 0.04 ^b
10:90	391.67 ± 3.79 ^c	93.29 ± 0.61 ^c	4.18 ± 0.03 ^c
15:95	334.67 ± 1.53 ^d	94.73 ± 0.11 ^d	3.53 ± 0.02 ^d

Different letters in the same column are significantly different at 5% of probability

Introduction

The cost of animal protein is increasing every day, thus making it unavailable for most people in developing countries. This unavailability has resulted into looking for other alternatives protein sources. Gradual shift way from fiber in diets calls for development of recipes, formulae and products that would restore the levels of dietary fiber.

Baked foods such as biscuits and breads offer several important advantages including; wide consumption, relatively long shelf life (biscuit), good eating quality, highly palatable and acceptable in most countries and used as used as a vehicle for incorporation of different nutritionally rich ingredients.

Fenugreek (*Trigonella foenum-graecum* L.) is an annual legume mainly used as a spice crop in many parts of the world. It is locally used as a pulse, spice and medicinal plant, and has a long history in Ethiopia.

Objectives

To evaluate the possibility of the production of food products using fermented fenugreek and wheat flours.



Fig. 1. Prepared fenugreek based products

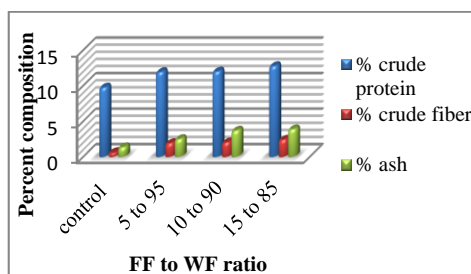


Fig. 2 Nutritional profile of biscuit

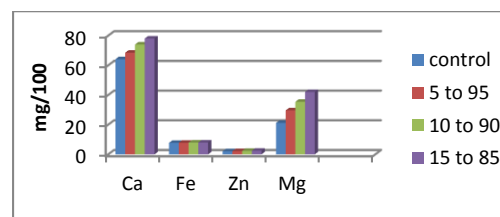


Fig. 3. Minerals content of breads

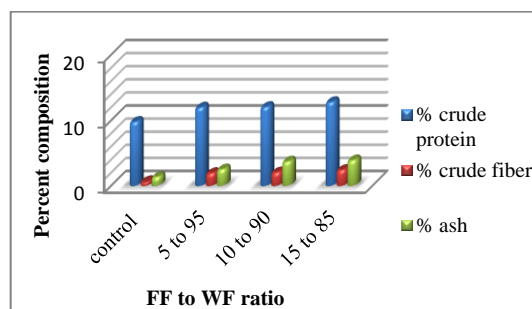


Fig. 4. Nutritional profile of breads

- A significant reduction in loaf volume was observed as the level of supplementation with non wheat flour was increased but up to 10 percent level of supplementation of fenugreek flour blend produced bread with satisfactory specific loaf volume (Table 2).
- Physical characteristic biscuits results showed significant difference between treatments compared with the control of spread factor of biscuits (Table 1).
- Addition of FF to wheat flour significantly increased the content of mineral contents in the bread and biscuit samples (Fig 3) in addition the nutritional content increased (Fig 2and 4).
- The sensory results showed that 5% for biscuit and up 10 % for bread; fenugreek flour can be incorporated to prepare acceptable quality products (Fig 1).

Conclusions

Acceptable and nutritious bread and biscuit was produced from composite flours of wheat and germinated fenugreek flour.

Germinated fenugreek flour supplementation significantly improved the dietary fiber, mineral and protein content of the composite products.

It is concluded from the present investigation, that fenugreek has a great potential to be used for preparation of value added bread and biscuit.

Acknowledgement

