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EFFECT OF FENUGREEK SEEDS FLOUR BLENDING ON SENSORY AND CHEMICAL CHARACTERISTICS OF SEMOLINA *IDL*

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ABSTRACT

The present study was carried out to prepare value added semolina *Idli* by incorporation of different treatments of fenugreek seeds flour i.e raw, soaked and germinated and to assess their sensory acceptability and nutrient contents. Fenugreek seeds flour was blended at 5%, 10%, 15% and 20% for T₁, T₂, T₃ and T₄ treatment respectively. Findings revealed (T₁) was most acceptable for its colour, flavour, texture, taste and overall acceptability. It was true for all Raw, Soaked and Germinated treatments. Statistical analysis at P≤0.05 showed that there was significant difference among all the treatments. Nutrient composition was improved for Protein, Ash, Dietary fibre and Mineral whereas Fat, Carbohydrate, Moisture and Energy level was decreased after value addition of fenugreek seeds flour at different levels. Germinated fenugreek seeds flour blends were found superior in nutritional quality compared to other flours blends.

Keywords: Semolina, fenugreek, Raw seeds, Soaked seeds, Germinated seeds

INTRODUCTION

Wheat (*triticum*) is a worldwide cultivated crop from the arid areas of Middle East to alluvial plains of Asia, America and Australia. Semolina is the purified middling of hard wheat and is used in making pasta, breakfast cereals and puddings. In North India semolina is known as “Suji” and in South India, “Rava” or “Ravey”. (Gisslen *et al*, 2001) Semolina is a good source of carbohydrate and protein and is an average source of dietary fibre.

Fenugreek (*trigonella faenum graccum*) is an erect annual herb native to Southern Europe and Asia. It is commonly known as “Methi” in India

(Wikipedia, 2008). Fenugreek seeds are rich source of protein (25%), lysine, tryptophan and dietary fiber (24%). They are also rich in polysaccharide galactomannan and are a good source of calcium, iron and β-carotene. (Gopalan *et al*, 2007) Owing to their many properties fenugreek seeds are one of the most valuable spices for controlling glucose metabolism and for the prevention and treatment of type II diabetes (Scott, 2007). Fenugreek seeds are one of the richest sources of phytoestrogens and selenium and thus are a very useful spice for women who have low estrogens levels (Sri *et al*, 2008). Fenugreek seeds may have anti-tumourigenic

effects too. Although semolina is widely used in India cuisines, it is considered nutritionally poor due to deficiency of essential amino acids such as lysine and theonine. Since fenugreek seeds are very rich in essential amino acids, the blending of fenugreek seeds flour in suitable proportion with a poor source of protein like semolina can products for people having certain diseases (Jood *et al*, 2007) and for common people as well.

OBJECTIVES

1. To standardize the level of fenugreek seeds (raw, soaked and germinated) flour for blending with semolina *idli* on the basis of sensory analysis.
2. To find out sensory characteristics of semolina *idli* prepared by incorporating fenugreek seeds flour.
3. To determine chemical composition of semolina *idli* blended with fenugreek seeds flour.

increase the protein contents of blended products (Hooda *et al*, 2004). Due to several medicinal and nutritional properties of fenugreek seeds, the inclusion of fenugreek seeds flour with common foods like wheat flour and semolina can be exploited to prepare good alternative food

MATERIALS AND METHODS

The present study was carried out in the research laboratory of Foods & Nutrition, Department of Ethelind School of Home Science, Sam Higginbottom Institute of Agriculture, Technology & Sciences, (Formerly Allahabad Agricultural Institute-Deemed University), Allahabad. Three major treatments i.e raw, soaked and germinated fenugreek seeds flour was taken along with control group each treatment was standardised at 5%, 10%, 15% and 20% level of blending.

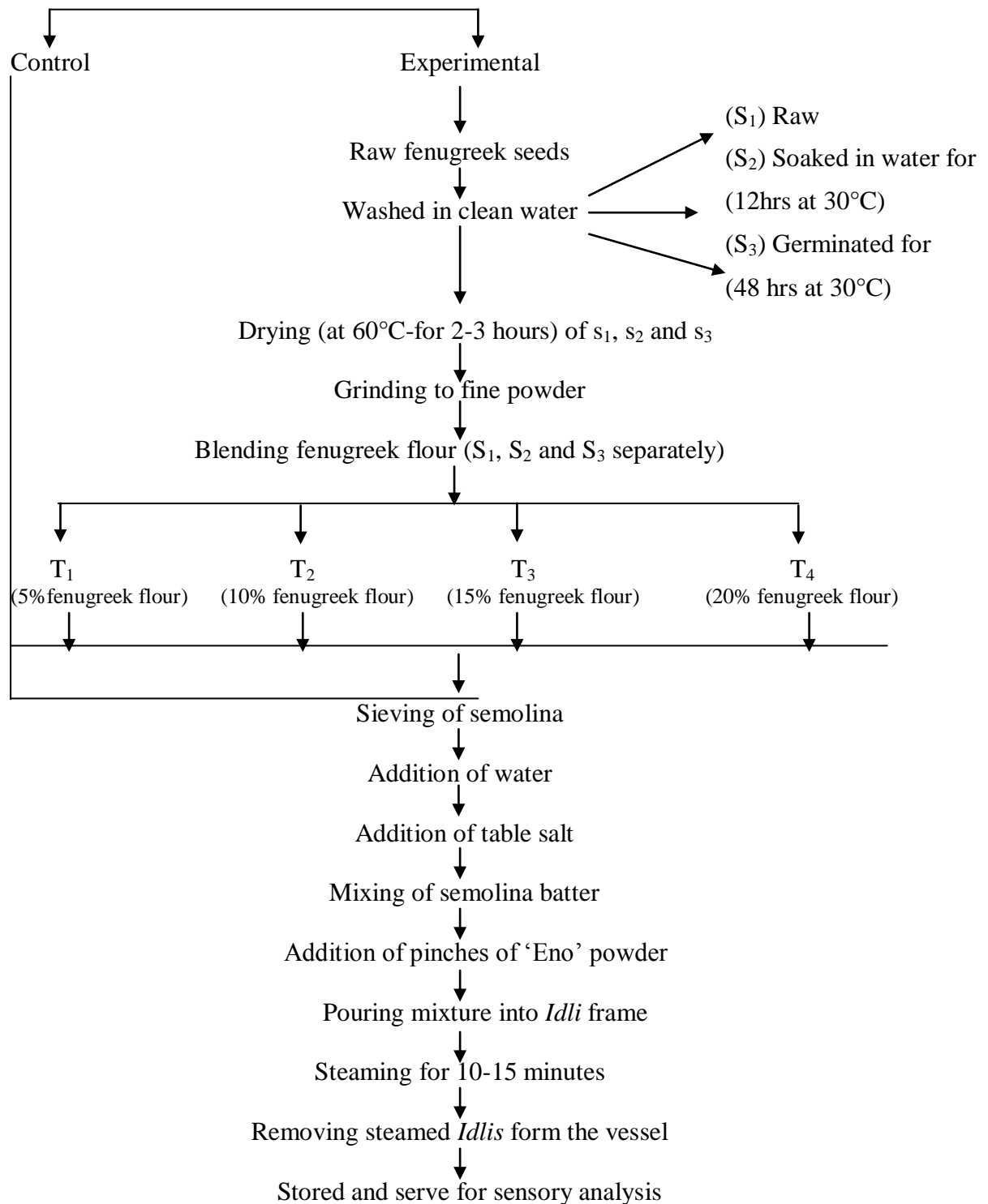


Fig. 1: Flow chart for control and experimental Semolina Idli.

The treatments were replicated four times. For sensory evaluation '9' point hedonic scale was used by 6 panel judges to get the sensory acceptability of the product. Nutrient content was analysed by using AOAC (1980) procedures and the data

were further statistically compared for 3x5 factorial design and critical difference techniques. (Fisher, 1955)

RESULT AND DISCUSSION

The findings are shown in Table I & II. Table I shows the average scores for sensory characteristics of semolina *Idli* blended with fenugreek seeds flour. Among different treatments raw fenugreek seeds flour blending at 5% (T_1) shows highest scores for colour, flavour and texture. Taste and overall acceptability scores show that T_1 (5%) gets highest scores among all treatments. It can be concluded that as the level of fenugreek seeds flour increases its amber yellowish colour dominate which makes the semolina *Idli* less acceptable. Therefore T_1 is considered the best among treatments as for as sensory characteristics are concerned. Statistical analysis shows that there is significant difference among them. Table II shows the nutrient composition of semolina *Idli*. Nutrient analysis indicates that semolina *idli* blended with raw fenugreek seeds flour has highest Energy content i.e 181 kcal/100g followed by soaked fenugreek seeds flour (177kcal/100g) and germinated fenugreek seeds flour (172 kcal/100g) while control (T_0) contains 193 kcal/100g of Energy. Control (T_0) sample shows the highest level (28.3g) of Carbohydrate, while it decreases to 26.1g, 25.8g and 25.4g for raw, soaked and germinated fenugreek seeds flour blended semolina *Idli*,

respectively. In case of Protein, control (T_0) sample shows lower value (14. 5g) in comparison to treatments i.e 15.6g, 15.2g, 15.0g for raw, soaked and germinated fenugreek seeds flour blended semolina *Idlis* respectively. Among the treatments raw fenugreek seeds flour blended semolina *Idli* shows the highest level of Fat i.e 1.9g followed by 1.4g for soaked and 1.1g for germinated fenugreek seeds flour blended *idlis*. This is more or less similar to the findings obtained by (Shirani & Ravindran (2008). In case of Moisture, control (T_0) sample shows the highest value (54g) in comparison to treatments i.e 51.3g, 53.2g, 50.7g for raw, soaked and germinated fenugreek seeds flour blended semolina *Idlis* respectively. In case of Ash, control (T_0) sample showed lower value in comparison to treatments. Germinated fenugreek seeds flour has highest Dietary fibre content (5.2g) followed by soaked fenugreek seeds flour (5.1g) and raw fenugreek seeds flour (4.9g) while control (T_0) contains 3.9g of Dietary fibre. In case of Iron, control (T_0) sample shows lower value in comparison to treatments. Similarly in case of Calcium, control (T_0) sample shows lower value in comparison to treatments.

Table I : Average score for sensory characteristics of fenugreek seeds flour blended semolina *idli*

Treatment Sensory Attributes	Raw fenugreek seeds flour					Soaked fenugreek seeds flour					Germinated fenugreek seeds flour				
	T_0 (Control)	T_1	T_2	T_3	T_4	T_0 (Control)	T_1	T_2	T_3	T_4	T_0 (Control)	T_1	T_2	T_3	T_4
Colour	7	6.8	6.2	5.7	5.2	7.2	6.6	5.8	5.4	4.4	6.6	6.6	5.7	5	3.8
Flavors	6.73	6.8	6.3	5.8	5	6.3	6.7	5.8	5.2	4.5	6.6	6.66	5.8	5.1	3.3
Texture	6.8	6.5	6.2	5.9	5.6	6.6	6.6	6.4	5.5	5.2	6.6	6.6	5.6	5.06	4.6
Taste	6.8	6.8	6.4	6.13	4.86	6.4	6.7	5.8	5.3	4.4	6.6	6.71	5.9	5	3.6
Overall acceptability	6.68	6.27	5.2	4.83	4.06	6.5	6.06	5.2	5.03	4.33	6.61	6.66	5.8	5.05	3.95

Statistical Analysis - ANOVA at $P \leq 0.05$ was applied for all the treatment and significant result was obtained.

Table II: Average nutrient contents of fenugreek seeds flour blended semolina *Idli*

Nutrients	Control (T ₀)	Raw fenugreek seeds flour	Soaked fenugreek seeds flour	Germinated fenugreek seeds flour
Major nutrients				
Total energy (kcal)	193	181	177	172
Carbohydrate (g)	28.3	26.1	25.8	25.4
Protein(g)	14.5	15.6	15.2	15
Fat (g)	1.9	1.6	1.4	1.1
Moisture (%)	54	51.3	53.2	50.7
Ash (mg)	1.1	1.4	1.6	1.8
Minor nutrients				
Iron (mg)	1.1	2.82	2.9	2.9
Calcium (mg)	18.1	26.9	27	27.2

S=Significant, NS= No Significant

CONCLUSION

On the basis of sensory evaluation and nutrient analysis of the treatments T₁ (5 % fenugreek seeds flour) is found to be the best. It can be concluded that value addition of semolina *Idli* with fenugreek seeds flour increases Protein, Ash, Dietary fibre, Iron and Calcium contents while decreases the Moisture, Fat, Carbohydrate and Energy contents. Among all the treatment combinations of the product, the treatment T₁ with germinated fenugreek Seeds flour is the most beneficial in terms of nutrients.

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