



UTILIZATION OF FRESH HERBS FOR THE DEVELOPMENT OF MISSI ROTIS TO SUIT LIFESTYLE DISEASES WITH EMPHASIZE ON OBESITY

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Abstract

Several diseases come under the umbrella of non-communicable diseases and more common cause is obesity. The problem of obesity is confined not only to adults but also to children and adolescents. Lifestyle diseases and conditions have been variously defined. A EURO symposium in 1957 defined it in the following manner : “An impairment of bodily structure and / or condition that necessitates a modification of the patient’s normal life and has persisted over an extended period of time.” Traditionally *missi roti* is a accompaniment in breakfast and meals all over the Country, prepared from wheat flour, Onion and Besan. Soya leaves, Palak leaves and Fenugreek leaves were incorporated to enrich its nutrients *i.e.* protein, dietary fiber, calcium, iron, Vitamin A and Vitamin C and reduce Carbohydrate and overall energy with emphasize to reduce obesity and the lifestyle diseases caused by them. The results obtained from sensory attributes, it was evident that the most acceptable experimental treatments were T_3 (15% Spinach leaves, 15% Soya leaves, 15% Fenugreek leaves, 2g of Besan and 1.5% Flaxseed Flour) for *Missi Roti*. T_3 is highest in Calcium, Iron, Vitamin A, Vitamin C and reduction in carbohydrate and overall energy in comparison to T_0 , T_1 and T_2 , respectively. The cost of the control *Missi roti* T_0 was 2.87 Rs./100 g, T_1 was (3.20Rs/100 g), T_2 was (3.29 Rs/100 g) and T_3 was (3.71Rs/100 g). The cost of the experimental samples of developed product is increasing due to incorporation of Soya leaves, Palak leaves and Fenugreek leaves at different levels. Due to addition of these leafy vegetables nutritional value of the product also increases.

Key words : Obesity, lifestyle diseases, enrich, sensory attributes.

Introduction

Traditionally *missi roti* is a accompaniment in breakfast and meals all over the Country, prepared from wheat flour, Onion and Besan. Soya leaves, Palak leaves and Fenugreek leaves were incorporated to enrich its nutrients *i.e.* protein, dietary fiber, calcium, iron, Vitamin A and Vitamin C and reduce Carbohydrate and overall energy. Soya leaves is scientifically known as *Anethum graveolens* and is good source of Vitamin A, Vitamin C, Vitamin B₆, calcium, iron, folate, potassium, magnesium, magenese and dietary fibre. It activates the secretion of bile and digestive juices, is a good stimulant and sedative, helpful in different causes of hiccups, prevents the risk of cancer, helps in reducing the bone loss after menopause and rheumatoid arthritis. Spinach leaves also known as *Spinacia oleracea* contains good amount of Vitamin A,

Vitamin C, Vitamin K, Vitamin B₆, Vitamin E, calcium, iron, folate, potassium, magnesium, magenese and dietary fibre. Spinach is beneficial for weight loss, anti – cancer, promotes eye health and healthy bones, lower hypertension, relaxes the body, gastrointestinal health, brain and nervous function, helps in prevention of atherosclerosis and heart attack, lowers blood pressure, anti – inflammatory properties, aids in calcification, boosts immunity and prevents anemia. Funugreek leaves contains Choline, trigonelline, diosgenin, yamogenin, gitigenin, tigogenin, protein, iron, B Vitamins and dietary fiber which may help control cholesterol, triglyceride as well as high blood sugar levels in diabetics, as a laxative, digestive and as a remedy for cough and bronchitis, spice and vegetable. India is troubled with triad of health issues, which includes communicable diseases, non communicable diseases and maternal and child health problems. Hypertension, diabetes, obesity,

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cerebrovascular accidents, cardiovascular diseases, cancers, stress etc. are common in India. Integrated approach of preventive, promotive, curative and rehabilitative initiatives will help in tackling this problem. Yoga helps in reduction and maintenance of blood pressure in hypertensives, controlling blood sugar levels and avoiding complications in diabetics, reducing the initiation and progression of cancers, reducing stress, anxiety, fatigue, and depression, control over substance abuse, bringing down chances of myocardial infarction and cerebrovascular accidents, improving fertility, reducing the complications of child birth, controlling hyperlipidemia and thus obesity related complications. Multiple micronutrients including both dietary and endogenous antioxidants together with a low-fat, high-fiber diet should be used in place of one dietary anti oxidant for controlling and preventing obesity and associated lifestyle diseases and for that missi rotis incorporated with soya leaves, palak leaves and fenugreek leaves is a welcome change and is well acceptable to combat the lifestyle diseases.

Materials and Methods

The detail of materials experiments, procedure and techniques followed during the course of the present investigation has been elaborated under the following heads:

Experimental site

The investigation was conducted in the Department of Foods and Nutrition, Ethelind School of Home Science, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Allahabad, U.P., India.

Procurement of raw material

The raw materials for the recipe development like Wheat flour, Onion, Besan, Soya leaves, Palak leaves and Fenugreek leaves were purchased from the local market of Allahabad district.

Experimental design

The basic recipe was standardized and served as control (T_0) three treatment *i.e.* incorporation of multi flour (Soya leaves, Palak leaves and Fenugreek leaves) at different level was referred to as T_1 , T_2 and T_3 , respectively for the prepared *Missi rotis*.

Method of preparation of Missi roti

All the ingredients were combined in a bowl and kneaded into a soft, smooth dough using enough water and Kept aside for 10 minutes. One portion of the dough was rolled out into 150 mm (6") diameter thick circle using a little flour for rolling. Each roti was cooked on a non – stick tava over a medium flame till both sides are

golden brown and served hot.

Variations : Missi roti was prepared by incorporating 5% Spinach leaves, 5% Soya leaves, 5% Fenugreek leaves, 2g of Besan and 1.5% Flaxseed Flour in 81.5g of Wheat Flour in T_1 , T_2 was prepared by incorporating 10% Spinach leaves, 10% Soya leaves, 10% Fenugreek leaves, 2g of Besan and 1.5% Flaxseed Flour in 66.5g of Wheat Flour and T_3 was prepared by incorporating 15% Spinach leaves, 15% Soya leaves, 15% Fenugreek leaves, 2 g of Besan and 1.5% Flaxseed Flour in 51.5g of Wheat Flour.

Table 1 : Details of treatments for Missi roti.

Product/treatment	T_0	T_1	T_2	T_3	Repli- cation
Palak leaves	-	5	10	15	5
Soya leaves	-	5	10	15	5
Fenugreek leaves	-	5	10	15	5
Flaxseed flour	-	1.5	1.5	1.5	5
Besan		2	2	2	5
Total % of incorporation	-	18.5%	33.5%	48.5%	

Sensory evaluation of Missi rotis

The organoleptic characteristics of the product was analysed, using 9 point hedonic scale by five panel member randomly selected from the Department of Food and Nutrition, Ethelind School of Home Science. The products was judged for the qualities such as- Body and Texture, Flavor and Taste, Color and Appearance, Overall acceptability. The mean scores for each product and each treatment was calculated.

Calculation of nutritive value of the Missi rotis

Calculation of Energy, Protein, Carbohydrate, Fat, Fiber, Calcium, Iron, Vitamin A and Vitamin C was calculated as per the reference value given in food composition table (Gopalan *et al.*, 2010).

Statistical analysis

The data collected were tabulated and analyzed statistically with the help of approved statistical techniques (Imran and Coover, 1983). Frequency, percentage, mean scores, paired t-test, critical difference and analysis of variance were applied.

Results and Discussion

Organoleptic evaluation of value added food product : The most acceptable treatment in terms of colour and appearance was T_3 (15% Spinach leaves, 15% Soya leaves, 15% Fenugreek leaves, 2g of Besan and

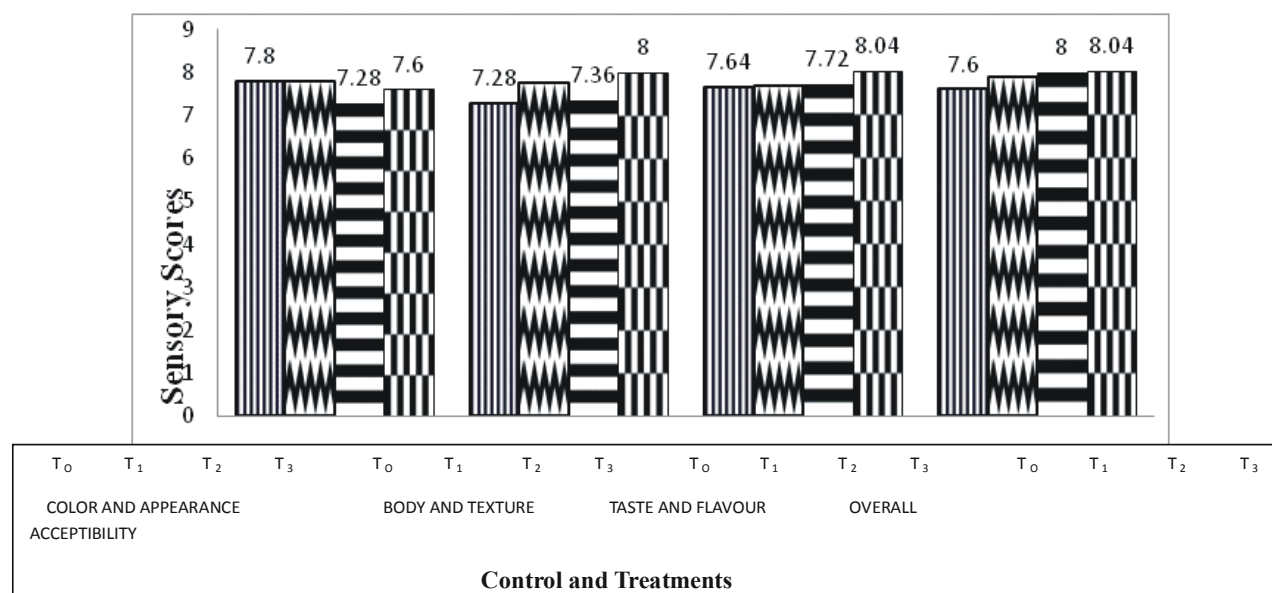


Fig. A : Average sensory scores for different attributes of Missi roti.

Table 2 : Average sensory scores of different parameters in control and treated sample of *Missi roti*.

Sensory characteristics/ treatment	Scores on 9 point hedonic scale			
	Colour and Appearance Mean±S.E	Body and Texture Mean±S.E	Taste and Flavour Mean±S.E	Overall acceptability Mean±S.E
T ₀ (Control)	7.80±0.20	7.28±0.15	7.64±0.16	7.48±0.13
T ₁ (5%)	7.80±0.26	7.76±0.27	7.68±0.26	7.71±0.23
T ₂ (10%)	7.64±0.14	7.36±0.18	7.72±0.14	7.52±0.09
T ₃ (15%)	7.92±0.30	8.20±0.21	8.08±0.25	8.07±0.21
F Value	0.234 ^{NS}	3.96 ^S	0.393 ^{NS}	1.83 ^{NS}
CD Value	-	0.65	-	-

a) **Colour and Appearance** : Fcal = 0.234 F 3, 12 (5%) = 3.49 non-significant, P≤0.05.

b) **Body and Texture** : Fcal = 3.96 F3, 12 (5%) = 3.49 significant, P≤0.05.

c) **Taste and Flavour** : Fcal = 0.393 F3, 12 (5%) = 3.49 non-significant, P≤0.05.

d) **Overall acceptability** : Fcal = 1.83 F3, 12 (5%) = 3.49 non-significant, P≤0.05.

Table 3 : Nutritional composition in control and treatment sample of *Missi roti*.

Nutrients/100g	Treatments			
	T ₀	T ₁	T ₂	T ₃
Energy (kcal)	370.50	300.66	256.86	213.06
Protein(g)	13.0	11.20	10.01	8.81
Carbohydrate(g)	75.70	59.18	49.75	40.33
Fat(g)	1.75	2.16	2.01	1.86
Fiber(g)	2.20	1.73	1.53	1.33
Calcium(mg)	68.00	75.19	100.39	191.29
Iron (mg)	5.50	4.69	4.51	7.09
Vitamin 'A'(gm)	290.0	502.77	974.52	1446.27
Vitamin 'C'(mg)	0.00	2.62	5.22	7.82

1.5% Flaxseed Flour) for *Missi Roti*, the most acceptable treatment in terms of Body and Texture was T₃ for *Missi roti*, the most acceptable treatment in terms of Taste and Flavor was T₃ (15% Spinach leaves, 15% Soya leaves, 15% Fenugreek leaves, 2g of Besan and 1.5% Flaxseed Flour) for *Missi Roti* and the most acceptable experimental treatments were T₃ (15% Spinach leaves, 15% Soya leaves, 15% Fenugreek leaves, 2g of Besan and 1.5% Flaxseed Flour) for *Missi Roti*.

Nutritive value of value added food product : T₀ in *Missi roti* contained 408.0 Kcal energy, 13.50 per cent protein, 77.80 per cent carbohydrate, 4.80 per cent fat, 0.20 per cent fiber, 165 mg calcium, 1.80 mg iron, 31.0 mg Vitamin A and 1.0 mg Vitamin C, T₁ contained 407.98 Kcal energy, 12.71 per cent protein, 72.76 per cent carbohydrate, 6.38 per cent fat, 2.10 per cent fiber,

200.36 mg calcium, 5.90 mg iron, 52.75 mg Vitamin A and 1.15 mg Vitamin C, **T₂** contained 405.23 Kcal energy, 11.77 per cent protein, 68.41 per cent carbohydrate, 7.42 per cent fat, 3.94 per cent fiber, 233.41 mg calcium, 9.98 mg iron, 74.05 mg Vitamin A and 1.30 mg Vitamin C and **T₃** contained 402.28 Kcal energy, 10.83 per cent protein, 64.06 per cent carbohydrate, 8.46 per cent fat, 5.77 per cent fiber, 266.46 mg calcium, 14.06 mg iron, 95.35 mg Vitamin A and 1.45 mg Vitamin C.

Cost of value added food product : The cost of the control Missi roti **T₀** was 2.87 Rs/100 g, **T₁** was (3.20 Rs/100 g), **T₂** was (3.29 Rs/100 g) and **T₃** was (3.71 Rs/100 g).

Conclusion

Obesity and the lifestyle diseases arising due to that requires specific dietary modification to promote weight loss, reduce or balance the situation of nutritional deficiency disorders arising out of it and lifestyle modifications. At the same time inclusion of functional foods, low glycemic index foods, vegetarianism etc. play pivotal role in reduction of obesity and the lifestyle diseases arising out of it. The ideal way to reduce body fat, brings down blood pressure, blood sugar, blood cholesterol, reduce stress and improves feeling of well being to include Missi rotis made by incorporating Soya leaves, Palak leaves and Fenugreek leaves enriches its nutrients i.e protein, dietary fiber, calcium, iron, Vitamin A and Vitamin C and reduce Carbohydrate and overall energy by roasting making no use of oil during its can be integrated in our lifestyle practices to reduce obesity and the lifestyle diseases caused by them significantly.

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