

Incorporation of garlic paste and flaxseeds powder in the preparation of bread and bun by using fresh and dried yeasts

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The present study was carried out with the objectives to find out the feasibility of fresh and dried yeasts in bread and bun prepared by incorporating garlic paste and flaxseeds powder, to assess the organoleptic characteristics of the prepared products and to calculate the nutritive value of prepared products. Products prepared without any incorporation of garlic paste and flaxseeds powder were served as control (T_0). Treatments prepared with incorporation of garlic paste and flaxseeds powder at 1 per cent, 2 per cent, 3 per cent and 5 per cent, 10 per cent, 15 per cent served as T_1 , T_2 and T_3 , respectively. Sensory evaluation of the prepared product was carried out by using the nine point hedonic scale. The nutritive value was calculated with the use of the food composition table on nutritive value (Gopalan *et al.*, 2004). The experiment was replicated five times and the data obtained during investigation was statistically analyzed by using analysis of variance (ANOVA) and critical difference (C.D.) techniques. In accordance to sensory parameters T_2 (2 % garlic paste and 10 % flaxseeds powder) was found to be the best in texture, colour and overall acceptability of the bread and bun. According to yeasts, the significant difference was found in the overall acceptability of the bread and bun. The nutritive value of the products showed that protein, energy, fat, fibre and calcium content increased. Thus, it can be concluded that the garlic paste, flaxseeds powder and both types of yeast can be successfully used in the preparation of bread and bun.

Key Words : Bread, Bun, Garlic paste, Flaxseeds powder, Organoleptic characteristics

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INTRODUCTION

Bakery products are a new dimension in modern times owing to their versatility in day to day life. The bakery industry, production of which has been increasing steadily in the country, is the largest among the processed food industries in India. The two major bakery *viz.*, bread and biscuit account for about 82 per cent of total products. (Roy, 2008) Bread is one of the oldest known recipe to man. It is a staple food prepared by cooking dough of flour and water possibly more ingredients. Dough are usually baked in some cuisines bread

are leavened or unleavened. Salt, fat and leavening agents such as yeast are common ingredients. Fresh bread and bun are prized for its taste, aroma, quality and texture. Bread made from refined wheat flour is consumed extensively throughout the world, especially by populations in developing countries. Several countries have passed legislation for the addition of iron and vitamins to wheat flour as a strategy to decrease the high prevalence of iron deficiency. Up to now, most of these efforts were ineffective because of several factors: 1) flours of various levels of refinement are used to make bread; those flours that are less refined have higher contents of phytic acid (*myo*-inositol-6-phosphate) which is a strong inhibitor of iron absorption; 2) low consumption of bread; 3) type of iron fortification used; 4) health status and environmental factors that affect iron metabolism and 5) low level of fortification. (Fernando *et al.*, 2006) Garlic (*Allium sativum* Linn.) a pungently flavoured biennial herb of the onion family, is one of the oldest herbs. It has irregular roots, condensed,

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flattened stem and narrow, flat leaves. Each garlic bulb is made up of number of smaller bulbs or 'cloves' and these cloves are separated and used in cooking. China is the highest producer of garlic followed by India. (Yadav *et al.*, 2008) The scientific name of flaxseed is *linum usitatissimum* and commonly it is known as "linseed" in India. It is generally known as Alsi. It is mainly grown in Canada but found all over the world.

METHODOLOGY

The study entitled "Incorporation of garlic paste and flaxseeds powder in preparation of bread and bun by using fresh and dried yeasts" was carried out in Research Laboratory, Halina School of Home Science, Sam Higginbottom Institute of Agriculture, Technology and Sciences (Deemed -to-be-University), Allahabad.

The details of materials, experiments procedure and techniques adopted for the study are as follows:

Procurement of raw materials:

All ingredients (refined wheat flour, sugar, salt, yeast, flaxseeds and garlic). were purchased from the local market of Allahabad.

Details of treatments:

Following treatment combination was used for the preparation of bread.

Products based on dried yeast:

- T₀- Control without garlic and flaxseed with 6 gram of dried yeast.
- T₁- Incorporation of 1 per cent garlic paste and 5 per cent flaxseed with 6 gram of dried yeast.
- T₂- Incorporation of 2 per cent garlic paste and 10 per cent flaxseed with 6 gram of dried yeast.
- T₃- Incorporation of 3 per cent garlic paste and 15 per cent flaxseed with 6 gram of dried yeast.

Products based on fresh yeast:

- T₀- Control without garlic and flaxseed with 3 gram of fresh yeast.
 - T₁- Incorporation of 1 per cent garlic paste and 5 per cent flaxseed with 3 gram of fresh yeast.
 - T₂- Incorporation of 2 per cent garlic paste and 10 per cent flaxseed with 3 gram of fresh yeast.
 - T₃- Incorporation of 3 per cent garlic paste and 15 per cent flaxseed with 3 gram of fresh yeast.
- Control and all treatments were replicated by five times.

Analysis of the prepared products:

Sensory analysis of the prepared products:

The product on the day of manufacture was evaluated by a panel of 5 judges selected from Halina School of Home Science

SHIATS, Deemed to be university Allahabad. The judges were requested to score the products with the help of 9 points Hedonic scale specially prepared for the purpose. (Srilakshmi, 2004).

Calculation of nutritive value of the prepared products:

The carbohydrate, protein, fat, calcium, fiber and energy of the products were calculated by using the value of the raw ingredients use of the food composition table on nutritive value given by (Gopalan *et al.*, 2004).

Statistical analysis of the prepared products:

The data obtained from the experiment were subjected to statistical analysis of variance techniques two way classification and critical difference techniques at (5%) probability level (Panse and Sukhatame, 1960-70).

OBSERVATIONS AND ASSESSMENT

The data collected on different aspects as per the methodology have been tabulated and analyzed statistically. The findings are also illustrated diagrammatically. The results obtained from the analysis are presented and discussed in this chapter.

Sensory analysis of bread and bun:

Sensory score of bread and bun with and without incorporation of garlic paste and flaxseeds powder in wheat flour showed that the treatment T₂ (2 % garlic paste and 10 % flaxseeds powder) best in flavour, texture, colour and overall acceptability of the bread and bun. According to yeasts, the significant difference was found in the overall acceptability of the bread and bun (Tables 1 and 2).

Determination of nutritive value of bread and bun:

It can be seen from Table 3 that the calculated nutritive value of the prepared bread and bun, maximum energy value in T₃ (626 kcal) followed by T₂ (619 kcal), T₁ (612 kcal) and T₀ (605 kcal). In T₀ carbohydrate content was lowest (119.57g) followed by T₁ (116.88g), T₂ (114.19g) and T₀ (115.50g). Protein content was highest in treatment T₃ (9.79g) followed by T₂ (8.44g), T₁ (8.02g) and T₀ (7.60g). In T₃ fat content was highest (16.02g) followed by T₂ (14.22g), T₁ (12.22g) and T₀ (10.62g). Fiber was found highest in T₃ (0.89mg) followed by T₂ (0.66mg), T₁ (0.43mg) and T₀ (0.20mg). Calcium content was found highest in T₃ (269.43mg) as compare to T₂, T₁, T₀ (185.51, 101.59, 17.65mg), respectively.

Nutritive value of prepared products:

Table 3 shows the average nutritional composition (g/100) of bread with and without incorporation of garlic paste and flaxseeds powder. Result reveals that except for carbohydrate energy, protein, fat, fibre and calcium were found

Table 1: Average sensory score for different parameters of control and treatments of bread

Treatments	Taste			Flavour			Texture			Colour			Overall acceptability		
	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value
T ₀	7.88±0.33	7.44±0.47	7.66	7.76±0.37	7.84±0.3	7.8	6.88±1.89	7.12±0.48	7.0	8.24±0.41	7.8±0.5	8.02	7.04±0.79	7.1±0.39	7.04
T ₁	7.8±0.2	7.76±0.03	7.78	7.72±0.28	7.4±0.33	7.56	7.56±0.34	7.96±0.23	7.75	7.28±0.22	7.2±0.8	7.24	7.78±0.20	7.86±0.08	7.82
T ₂	7.76±1.16	7.68±0.34	7.72	7.8±0.4	7.88±0.03	7.84	7.84±0.06	7.72±0.27	7.78	8.24±0.34	8.08±0.41	8.16	7.9±0.23	7.76±0.20	7.83
T ₃	7.72±0.56	7.64±0.41	7.68	7.84±0.67	7.52±0.6	7.68	7.16±1.12	7.4±0.35	7.28	7.08±0.37	7.04±1.76	7.06	7.28±0.29	7.24±0.32	7.26
F-Test due to yeasts		NS			NS			NS			NS			S	
F-Test due to treatments		NS			NS			S			S			S	

Table 2: Average sensory score for different parameters of control and treatments of bun

Treatments	Taste			Flavour			Texture			Colour			Overall acceptability		
	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value	Fresh yeast	Dried yeast	Average value
T ₀	7.6±0.17	7.6±0.65	7.6	7.56±0.38	7.6±0.17	7.58	6.44±0.3	7.56±0.50	7.0	6.92±0.46	7.16±1.76	7.04	7.2±0.48	7.49±0.74	7.34
T ₁	7.64±0.4	7.48±0.60	7.56	7.68±0.4	7.64±0.4	7.66	7.64±0.28	7.56±0.42	7.6	7.52±0.26	7.92±0.51	7.72	7.67±0.4	7.68±0.2	7.67
T ₂	7.6±0.3	7.6±0.3	7.6	7.36±0.46	8±0.04	7.68	7.68±0.37	7.68±0.37	7.68	7.6±0.21	8.08±0.1	7.84	7.59±0.2	7.82±1.05	7.70
T ₃	7.72±0.3	7.42±0.4	7.57	7.12±0.4	7.72±0.37	7.42	7.16±1.7	7.36±0.34	7.26	7.2±0.65	7.2±1.02	7.22	7.08±0.5	7.08±1	7.0
F-Test due to yeasts		NS			S			NS			S			S	
F-Test due to treatments		NS			NS			S			S			S	

Table 3 : Average percentage of nutrients in control and treatments sample of bread and bun

Nutrients	Control		Treatments	
	T ₀	T ₁	T ₂	T ₃
Energy (kcal)	605	612	619	626
Carbohydrate (g)	119.57	116.88	114.19	111.50
Protein (g)	7.605	8.02	8.44	9.79
Fat (g)	10.621	12.42	14.22	16.02
Fibre (g)	0.207	0.43	0.66	0.89
Calcium (mg)	17.67	101.59	185.51	269.43

to be increase with the increase incorporation level of garlic paste and flaxseeds powder in bread and bun.

Conclusion:

On the basis of above findings we can conclude that the fresh and dried yeasts could be utilized in the preparation of bread and bun. The organoleptic scores for bread and bun with the incorporation of garlic paste (2 %) and flaxseeds powder (10 %) in refined wheat flour was found to be the best in flavour, texture, colour and overall acceptability. According to yeasts, the significant difference was found in the overall acceptability of the bread and bun and dried yeast gave better products than fresh yeast. The nutritive value of the products showed that protein, energy, fat, fibre and calcium content increased with increase incorporation levels in both bread and bun.

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