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EFFECT OF DIFFERENT LEVEL OF WHEAT BRAN ON QUALITY OF BREAD

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ABSTRACT: ***The study was done on Effect of Different Level Of wheat Bran on Quality of Bread. The level of wheat flour and wheat bran was (0:100,5:95,10:90,15:85,20:80,25:75,30:70,35:65) percent in preparation of Breads. Result of sensory (appearance, color, flavour, texture, taste, and overall acceptability) evaluation revealed that the 85-15% addition of the bran is having higher overall acceptability. In case of physico-chemical parameters it was observed that loaf volume decreased when increased the wheat bran leveland loaf weight was increased when increased the level of bran. During chemical analysis of the bread (Ash,Fibre,Fat,Moisture) it was observed that 65-35% addition of bran was more acceptable because increased the level of bran which increased the percent of ash,fibre,and fat. Wheat bran has the capacity ,by its high fiber content, to absorb the cholesterol of the intestine and to expel it with feces to the outside before it is absorbed by the organism and also it prevent the constipation, colon cancer, breast cancer, and treatment of hemorrhoids, prevention of diverticulitis and also helps weight loss diets.***

Key words:Wheat bran bread, high fibrecontent, fat content.

I. INTRODUCTION

The wheat grain consists of three distinct parts: bran (13-17%), germ (23%) and endosperm (80-85%) and contains all essential nutrients. In general wheat grain contains 70% carbohydrates, 12% water, 2% fat, 12% protein, 1.8% minerals and 2.2% crude fiber are found in wheat grain kernel. It is also enriched with phosphorus, magnesium, manganese, zinc, selenium, iron, potassium and copper (Liu et al., 2012). Wheat flour is the major ingredient in making the health beneficial food products and the fibers in the wheat bran help to reduce the chances of colon cancer and preventing the some digestive disorders (Qu et al., 2005).Bran is the hard outer layer of grain and consists of combined aleurone and pericarp along with germ. When bran is removed from grains, they loss a portion of their nutritional value.wheat flour fortified with bran consist of rich source of these functional ingredients such as fiber, phytochemicals, minerals and essential amino acids that are located in the bran and fat soluble vitamins contained in the germ of the whole wheat grain (Dewettinck et al., 2008).

Research indicated that dietary fiber form wheat bran as part of a low-fat diet reduced the risk of colon cancer. Dietary fiber has been shown to have important health implications in the prevention for risk of chronic diseases such as cancer, cardiovascular diseases and diabetes [Trinidad et al.,2006]. Regular fiber intake helps to prevent obesity, cardiovascular diseases, type 2 diabetes, metabolic syndrome, and constipation (Slavin et al., 2008; Holma et al., 2010).The diets rich in fiber such as cereals, nuts, fruits and vegetables have a positive effect on health as their consumption has been related to decreased incidence of several diseases (Dhingra et al., 2012).Wheat bran has the capacity, by its high fiber content, to absorb the cholesterol of the intestine and to expel it with feces to the outside before it is absorbed by the organism. When addition of more fiber in bread then bread becomes poor quality in terms of texture, loaf volume, and appearance. (Gómez et al., 2003; Wang et al., 2002). The recommendation for the daily fiber intake is about 25 g but the average intake of fiber in the United States is about 10–15 g (Gelroth and Ranhotraet al., 2011) and The Academy of Nutrition and Dietetics (AND) recommends a dietary fiber intake of 25–35 g/day for a healthy adult. Several researchers have worked on the addition of dietary fibre to breakfast cereals and baked products particularly breads, cookies and other products in order to meet the consumer's health need (Nelson A. L., et al 2001; Rodriguez-Ambriz., et al2008)..Fiber contained in wheat bran increases intestinal peristalsis andsoftens the fecal matter so that it can be expelled to the outside more easily. But the addition of fiber-rich ingredients to the dough causes changes in water absorption and quality of the bread (Sluimer., et al 2005). And also the addition of bran or fiber generally weakens the structure of the bread by reducing the volume and elasticity of the crumb (Salmenkallio-Marttila et al., 2001) and decrease the gas retention capacity (Gómez et al., 2003).

Bread may be defined as a fermented bakery product produced mainly from white wheat flour, water, yeast and salt by a series of processes involving mixing, kneading, proofing, shaping and baking (Dewettinck et al., 2008; Banuet al., 2012) .Bread is an important staple food and the most widely consumed bakery product (Aini and Maimonet al., 1996 ;Abdelghaforet al., 2011) white flour derived from the processing of whole wheat grain, which is aimed to improving the aesthetic value of white bread, but reduction in the nutritional value of white bread when compared to bread made from whole grain cereals (Manejuet al., 2011).Today, bread occupies an important place in baking industry & constitutes over 50% to the total Indian market for bakery products. It is consumed by majority of population all over the world as a part of daily diet & is equally popular in Urban & rural regions. The present production of bread in India is 9.58 lakh tones & its

estimated growth rate is 9.7% per annum. Brown or whole meal breads generally made in a similar way to white bread except that a higher level of fat is normally used, e.g. 1.5% of the flour weight as fat, compared with 1% for white bread. As whole meal flour has higher water absorption than white. Consumer acceptance studies have revealed that over 80 percent of the panelist rated the whole wheat flour bread as good to excellent.

II. MATERIALs AND METHODS

The details of the materials used and methods adopted during the present investigations were presented in this chapter under appropriate headings.

Procurement of raw materials

Wheat Flour, Wheat Bran, Fat, Salt, Sugar, Yeast were purchased from local market of Allahabad.

Method for development of Bread

Breads were prepared with varying levels of ingredients such as yeast, salt, sugar, fat, wheat bran, water. According in preliminary experiments breads were prepared with 5%, 10%, 15%, 20%,25%, 30% and 35% of wheat bran baking at the temperature of 2300C to 2450C for 30 min.

Formulationsof Bread

Finally 8 formulations T0 (control), T1, T2,T3, T4,T5, T6 and T7 were prepared by using the proportion of wheat flour and wheat bran as 100:0, 95:5, 90:10, 85:15, 80:20, 75:25, 70:30 and 65:35 respectively.

Samples	Wheat flour	wheat bran	Fat	salt	sugar	yeast	water
T	100g	--	4g	1.5g	1g	2g	60ml
T_1	95g	5g	4g	1.5g	1g	2g	60ml
T_2	90g	10g	4g	1.5g	1g	2g	60ml
T_3	85g	15g	4g	1.5g	1g	2g	60ml
T_4	80g	20g	4g	1.5g	1g	2g	60ml
T_5	75g	25g	4g	1.5g	1g	2g	60ml
T_6	70g	30g	4g	1.5g	1g	2g	60ml
T_7	65g	35g	4g	1.5g	1g	2g	60ml

Table 1. Formulation of samples

III. RESULTS AND DISCUSSIONS

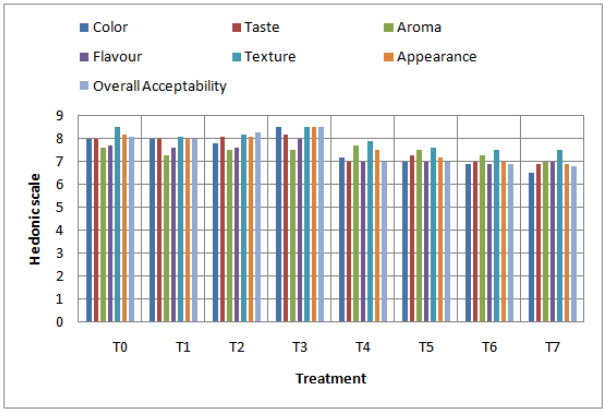
The experiments were conducted to "Studies on Effect of different level of Wheat Bran on Quality of Bread". The chemical, physical and organoleptic evaluation of Wheat bran bread had been carried out.

Effect of different levels of wheat bran on bread sensory properties

The mean sensory evaluations were done for general colour, flavour, aroma, taste, and overall acceptability as shown in the table 2. The result was depicted from the mean sensory score of below mentioned parameters that the Wheat bread (T_0) had scored 8.0 in between like much and like very much on a nine point Hedonic scale for over all acceptability and Wheat bran bread (T_1) had scored 7.8 in between like much and like moderately on a nine point Hedonic scale for over all acceptability and Wheat bran bread (T_2) had scored 7.9in between like much and like very moderately on a nine point Hedonic scale for over all acceptability and Wheat bran bread (T_3) had scored 8.2 in between like much and like very much on a nine point Hedonic scale for over all acceptability and Wheat bran bread (T_4) had scored 7.3 in between like moderately and like much on a nine point Hedonic scale for over all acceptability of Wheat bran bread (T_5) had scored 7.2 in between like moderately and like much on a nine point Hedonic scale for over all acceptability of Wheat bran bread(T_6) had scored 7.0 in between like moderately and like much on a nine point Hedonic scale for over all acceptability of Wheat bran bread(T_7) had scored 6.9 in between like slightly and like moderately on a nine point Hedonic scale for over all acceptability of Wheat bran bread all the experimental sample was i.e. T_0 8.0, T_1 7.8, T_2 7.9, T_3 8.2, T_4 7.3,T_5 7.2, T_6 7.0,T_7 6.9. The sensory analysis of samples T_0, T_1, T_2,, T_3 T4, T5, T6, T7were analyzed on the basis of 9 point Hedonic scale rating test.

Sample	Color	Taste	Aroma	Flavour	Texture	Appearance	Overall Acceptability
T_0	8.0	8.0	7.6	7.7	8.5	8.2	8.1
T_1	8.0	8	7.3	7.6	8.1	8.0	8.0
T_2	7.8	8.1	7.5	7.6	8.2	8.1	8.3
T_3	8.5	8.2	7.5	8.0	8.5	8.5	8.5
T_4	7.2	7.0	7.7	7.0	7.9	7.5	7.0
T_5	7.0	7.3	7.5	7.0	7.6	7.2	7.0
T_6	6.9	7.0	7.3	6.9	7.5	7.0	6.9
T_7	6.5	6.9	7.0	7.0	7.5	6.9	6.8

Table 2. Effect of different levels of wheat bran on bread sensory properties



Graph 1.Effect of different levels of wheat bran on bread sensory properties

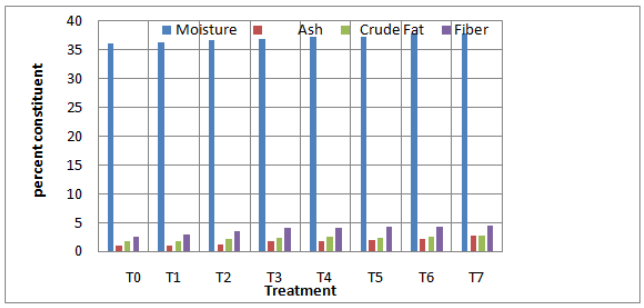
Chemical Analysis of Wheat bran bread

Chemical analysis of Wheat bran bread was calculated on the basis of moisture, ash, protein, fat and fiber content. There are different chemical properties of Wheat bran bread such as moisture content, ash content, fat, crude fiber, protein and their value of standard bread are 37.5, 1.2, 1.5 and 2.56percent respectively. In case of Wheat bran bread moisture, ash, fat and fiber were calculated including control sample T_0, sample T_1, sample T_2, sample T_3, sample T_4, sample T_5, sample T_6, and sample T_7 as below. Approximate composition of bread is presented in table 3 and fig.2. The addition of bran increased the moisture content, fiber content, Ash content and less amount of fat.All the increasing and decreasing composition of ash, moisture, fat and fibre are obtained in eight different treatment samples i.e. 100:0 (T_0), 95:05(T_1), 90:10(T_2), 85:15 (T_3), 80:20 (T_4),75:25(T_5), 70:30(T_6), 65:35(T_7) The analysis of Wheat bran bread shown that there were more level of incorporation of bran bread sample found high amount of chemical composition as compare remaining sample.

Sample	Moisture	Ash	Crude Fat	Fiber
T_0	36.17	0.93	1.753	2.566
T_1	36.31	0.87	1.82	2.96
T_2	36.65	1.10	2.05	3.56
T_3	36.97	1.76	2.39	3.98
T_4	37.26	1.66	2.48	4.12
T_5	37.35	1.87	2.37	4.33
T_6	37.89	2.12	2.59	4.31
T_7	37.96	2.62	2.66	4.46

Table 3. Chemical Analysis of Final Product (Percentage)

The chemical analysis of the final sample i.e. moisture content is in the range of 36 to 38 percent. The moisture content of the bread has direct relation with softness of bread. There was moisture loss from bread during storage so softness is decreased. The ash content indicates the mineral content of bread. The ash content increase with the level of incorporation so it's observed that T_7 sample was more acceptable than other samples because it was contain higher amount of nutrient than other samples.



Graph 2.Chemical Analysis of Final Product

IV. CONCLUSION

The studies were conducted for entitled "Effect of different level of Wheat bran on quality of bread". Eight samples were developed i.e.(0%, 5%, 10%, 15%, 20%, 15%, 20%, 25%, 30%, 35%) the 15% wheat bran sample was satisfactory after sensory analysis and in case of physicochemical analysis it was observed that 35% wheat bran sample was more acceptable.

It can be concluded that the colour was slightly Dark with increasing wheat bran and at the 15% level it was more acceptable. There was not much effect at 5% addition. It is revealed that the colour, texture, structure and sheen by adding 5% wheat bran in wheat flour there was slightly increased is in the above characteristics. At 0% level there was not much more effect. The bran having good medicinal and nutritional value it contain rich in ash,fat,anddietery fibers.

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