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To assess the nutritional composition and organoleptic properties of chapati spread prepared from triticale

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Abstract
Triticale (X Triticosecal wittmack), a man made cereal grass crop, obtained from hybridization of wheat (Triticum app) with rye (Secale cereal). Triticale grains can be used for human food and livestock feed. Triticale is the first species of an agricultural crop produced scientifically by humans. Germination may be define as an emergence of embryo from the seed by starting a variety of anabolic and catabolic activities, including respiration, protein synthesis and mobilization of food reserves after it has absorbed water.

The aim of this research was to evaluate nutritional quality and sensory properties of triticale based product that are - Chapati spread which are made from germinated grain triticale, wheat and pearl millet. The result of the nutritional analysis indicated that the nutritional composition of chapati spread are moisture -8.6, ash -1.91, protein- 3.87 and iron-1.80 gm. Regarding sensory properties, these products were evaluated on sensory parameters using nine point hedonic rating scale. Sensory score for chapati spread for appearance 8.0-9.0, texture 7.5-8.4 colour 7.0 -8.6, flavor 7.8-8.8 and overall acceptability is 8.0 -9.0. Sensory qualities of product (chapati spread) was monitored during storage and was found stable for 3 months. chapati spread are recommended for all age groups.

Keywords: cereals and millets, germination, sensory evaluation, chemical analysis

Introduction

Food is one of the basic needs of human existence. Food grains like – rice, wheat, millet, pulses and oilseeds constitute the basic food of human being. Food is defined as "anything eaten or drunk, which can be absorbed by the body to be used as an energy source building.

Cereals crops are members of the grass family and are fast growing and high in carbohydrates cereals and pulses make a balanced diet. Cereals are world wide the most important cultivated crops and account for the main source of energy and protein in human and domesticated animal diets (Rajaram 1995). Cereals are staple foods and are important source nutrients in both developed and developing countries. The minor grains include oats, barley, rye, triticale and millet. Cereals grains are rich sources of fiber, vitamins, minerals and photo chemicals.

Triticale is a new cereal crop resulting from a cross between wheat and rye. It not only retains the high yielding performance and good quality of wheat but also combines disease resistance to lerance and lush growth from rye. Furthermore, it displays improved characters; such as higher protein and lysine content in the grain compared to the parents. The second area of interest for triticale grain is in developing it as a food grain cereal that would exhibit unique baking traits. As a food grain, triticale has also been recognized as a hardy crop capable of helping combat world hunger. Triticale has potential in the production of bread and other food products such as pasta and breakfast cereals Pena (2004) [3].

Triticale is the hybrid grain developed from wheat (Triticum) and rye (secale) grains. The triticale grain can be grown under dryer condition than wheat and will produce a 50gm higher yield than wheat in drought conditions.

The nutritive value of triticale compares will with both wheat and rye. The limiting amino acids for triticale grain lysine, methinonine and tryplophen are the same as those of both rye and wheat. Found that both rye and triticale based diets produced better weight grain in rats than whole wheat grain during a 28 day feeding experiment.

The potential of triticale as a partial or total substitute for wheat in flour tortilla production by different mixtures of triticale and wheat flours were tested in a typical hot-press formulation. Both grains yielded similar amounts of flour. Wheat flour contained 1.5% more crude proteins, 1.6× more gluten, and produced stronger dough than triticale. Serna-Saldivar (2004) [4].

Germination is usually the growth of plant contained within a seed; it results in the formation of the seedling. It is also the process of reactivation of metabolic machinery of the seed resulting in the emergence of radical and plumule. Seed

germination depends on both internal and external conditions. The most important external factors include right or darkness. The seed germination is a mechanism, in which morphological and physiological alterations result in activation of the embryo. Before germination, seed absorbs water, resulting in the expansion and elongation of seed embryo. When the radical has grown out of the covering seed layers, the process of seed germination is completed. Hermann (2007) [2].

Sprouting is the practice of germinating seeds to be eaten raw or cooked. Sprouts can be germinated at home or produced industrially. They are a prominent ingredient of the raw food diet. Sprouts are said to be rich in digestible energy, bioavailable vitamins, minerals, amino acids, proteins and phyto chemicals as these are necessary for a germinating plant to grow. These nutrients are essential for human health. The salinity decreases seed germination by affecting the seed nitrogen (N) content and hence embryo growth. This indicates how N compounds can alleviate the stress of salinity on seed germination. Atia (2009) [1].

Methods and Materials

The study was carried out at the scientific laboratories of the faculty of Food science and Nutrition department of Chandra Shekhar Azad University of Agriculture and Technology.

Triticale, wheat and pearl millet over procured for the study from local market. First step of processing is collection, cleaning, washing, and germination than grained. All three grains were germination firstly for 2 days then sundry. After germination, roast all the three grains in a pan at 200 degree Celsius and grained it. Other ingredients like salt, black pepper and butter for chapatti spread procured from local market.

Formulation of Product

Chapati Spread

Chapatti Spread is prepared by the germinated roasted flours of triticale, pearl millet and wheat in the ratio of 20:10:15 respectively with the addition 55gm. of butter. Which is well mixed in a pan. Add some salt, black pepper and mix well the mixture.

Determination of proximate composition and mineral content: Moisture was determined by oven drying method of AOAC (ii) were used to determine protein content by micro Kjeldhal method, ash by combustion. Total iron was analyzed by AAS method.

Sensory Analysis

Sensory evaluation was conducted under fluorescent light, with the booth area maintained at a temperature 24 degree Celsius. A suitable score card was designed using nine point hedonic scale. The attributes selected were grouped under modalities such as appearance, texture, colour, flavor and overall acceptability. Trained panel members (5) were asked to mark on a scale to indicate the intensity of each attributed listed on the score card.

Statistical Analysis

The data were subjected to analysis of variance (ANOVA) test. The score given for all the sensory attributes such as appearance, texture, colour, flavor and overall acceptability for each sample were tabulated. The mean value was calculated for each attribute of a sample representing the panel's judgment about the sensory quality of the product.

Result and Discussion

The proximate composition protein, moisture, iron and ash of product Chapati Spread) are shown in Table No 1.

Table 1: Mean score of nutritive value of Chapati Spread (in per 100 gm)

Chapati spread	Nutrients			
Treatment	Moisture	Ash	Protein	Iron
T1 (20%)	8.6	1.91	3.87	1.80
T2 (15%)	8.4	1.30	3.86	1.49
T3 (10%)	8.3	1.20	3.85	1.18
SE (diff)	0.10	0.08	0.01	0.01
CD (0.05)	0.22	0.18	0.02	0.02

T1- Treatment 1, T2-Treatment 2, T3-Treatment 3

In Chapati Spread three treatments are prepared in which the lowest content of moisture was found in T3 8.3 percent and highest content in T1 that is 8.6 percent.

The highest content of Ash in the chapati spread was found in T1 that was 1.91 percent compared to other treatments as 1.30 percent was found in T2 and 1.20 was found in T3.

The lowest content of Protein in chapati spread was found in T3 that was 3.85 percent compared to other treatments.

Iron content of ratio T1 was highest 1.80 percent as compared to other treatments as 1.49 percent was found in T2 and 1.18 was found in T3.

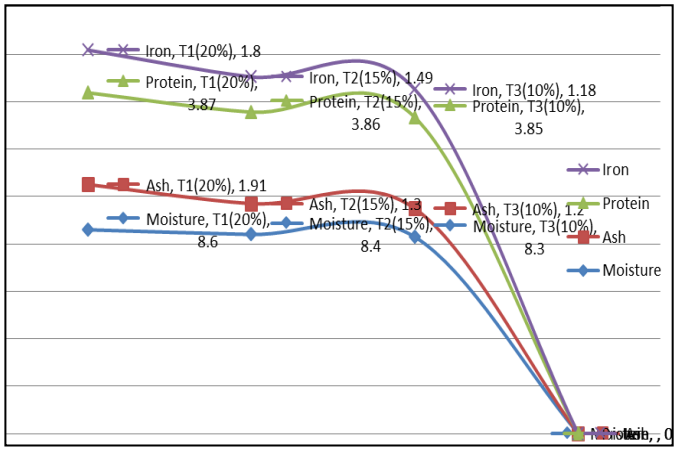

Fig 1

Discussion

Research finding of the study on influence of Triticale on the quality of prepared product, the three test products were selected by sensory evaluation.

In Chapati Spread the taste of the was much appealing in T1 in comparison to other two treatments because of the lower amount of wheat in T1 and increasing amount in T2 and T3. Texture of the product is acceptable in all three of them colour of T3 was less appealing and attractive due to the increased amount of while in T1 colour was highly appealing and attractive. The next attribute that is flavor was highly acceptable in T1 as compared to T2 and T3 because of the

decrease amount of wheat and increase of triticale in T1 so the overall acceptability was high in T1 in compared to T2 and T3.

Table 2: Mean score of organoleptic acceptability of Chapati spread

Parameters	Sensory Evaluation Attributes				
Treatment	Appearance	Texture	Colour	Flavour	Overall acceptability
T1 (20%)	9.0	8.4	8.6	8.8	9.0
T2 (15%)	8.6	7.6	7.4	6.8	8.2
T3 (10%)	7.0	6.4	7.0	6.6	6.8
SE (diff)	0.33	0.30	0.38	0.30	0.23
CD (0.05)	0.72	0.66	0.84	0.66	0.50

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