

Gluten Free Pasta to Combat Celiac Disease

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Abstract: The objective of this study was to investigate the consumer acceptance of gluten-free rice pasta made from rice flour, soy flour and spinach powder. Soy flour are having superior nutritional qualities and health benefits, hence they can be used for supplementation of rice based pasta. Pasta was prepared using rice flour (RF), soy flour (SP) and spinach powder (SP). 10 15 and 20 per cent soy flour and 5 per cent spinach powder added in rice flour to make pasta. Sensory quality was assessing by organoleptic evaluation. The result showed that over all acceptability of 10 percent soy flour added pasta was good in comparison to other combination.

Index Terms: Soy, Rice, Celiac disease, Spinach

I. Introduction-

As the industry has responded to consumer demand for a more health full supply, the variety of the functional foods that are consistently available to consumer grown tremendously and functional foods account for increasing percentage new food products (Nutr.Bus.J 2003). A gluten-free diet is a diet that excludes foods containing gluten. Gluten is a protein complex found wheat, barley, rye and triticale. A gluten-free diet is the only medically accepted treatment for celiac disease. Being gluten intolerant can often mean a person may also be wheat intolerant as well as suffer from the related inflammatory skin condition dermatitis herpeticiformis. There are a smaller minority of people who suffer from wheat intolerance alone and are tolerant to gluten. Celiac disease is one of the most common allergies, which is caused both environment (gluten) and genetic factors (Gujral et al. 2012). The prevalence of celiac disease in the United States and Europe has been estimated to be approximately 1 % of the general population (Niewinski 2008). Gluten corresponds to the major storage protein in wheat and plays an important role in wheat products, such as bread, and pasta. Spaghetti is a popular type of pasta and is made from durum wheat (*Triticum durum* L.) semolina and water kneaded to form dough with a moisture content of around 25–30 % (Marchylo and Dexter 2001). Thus rice is good alternative choices for producing gluten-free products. In addition, rice has many advantages, such soft taste, colorless, high digestibility, and low level of sodium (Marco and Rosell 2008). Health and convenience are the two major factors during today's development of breakfast snack and variety products. Realizing the malnutrition problems of low-income group people and preschool children, the need of upgrading of nutrition is becoming a major concern. In some areas poor economy, scarcity of certain foodstuffs is becoming the reason of malnutrition. Pasta is an extensively food usually made from wheat, which is consumed in most countries worldwide. It is however, rather low in protein and is relatively deficient lysine, an essential amino acid. This is especially important for efforts to feed the hungry using pasta as the primary source of calorie and protein. Pasta products are good source of carbohydrate and moderate source of proteins, but some essential amino acids and fiber content are low (Sowbhgya and Ali, 2001). . Messina et al. (2003) reported that soy foods have been found to have beneficial effects in reducing risks of coronary heart disease and may reduce risks for some cancers. Therefore, there have been many studies to supplement pasta with protein rich in lysine, such as soy protein (Paulson 1961, Calusi 1971 and Siegel and others, 1975). Chung et al. (2004) reported that lutein, a carotenoid protective against eye diseases such as age-related macular degeneration and cataract, is found in green vegetables, especially spinach, as well as kale and broccoli.

II. **Material and Methods-** Rice flour and soy flour was purchased from the local market and spinach leaves was also purchased from the local market and cleaned, washed, dried (hot oven 75⁰Cfor 5hour) and after drying, grind the leaves, then sieved 20 mesh sieves then produced powder. Spinach powder was incorporated with rice flour at different levels 03, 05, 07, 10 per cent. To standardized the level of spinach powder to make pasta and cooked, with organoleptic evaluation by semi skilled panel. On the basis of overall acceptability 05% spinach powder was acceptable. Pasta was prepared with the help of the pasta making machine (La man farina Italy). Pasta containing rice flour, soy flour and spinach powder in different blends (85:10:05, 80:15:05 and 75:20:05). Sensory quality like colour, flavour, texture, taste and overall acceptability of pasta was evaluated by semi skilled panel by using 9 point hedonic. The data was statistically analyzed by one way ANOVA test.

III. Result and Discussion-

3.1 Organoleptic Evaluation-

Table 1 showed the score for colour was 8.90-9 respectively. The statistically result showed colour of 75:20:05 pasta was non-significantly different. In present study of pasta of colour was lower to 8.9 reported by **kavitha et al. (2006)**. Taste of RF:SF:SP (75:20:05, 80:15:05 and 85:10:05) pasta samples were 8.50, 9.00 and 9.00, respectively. The result showed taste of 75:20:05 pasta was non-significantly different. **Midha and Mogra (2007)** reported the taste 7.5 to 7.9 which was quite higher to present study. The flavour was 8.00 to 8.90. The result showed flavour of 75:20:05 pasta was non-significantly differ ($P \leq 0.05$) with 85:10:05 pasta and non-significantly differ. The flavour of pasta was quite similar reported by **kavitha et al. (2006)**. **Agarwal et al. (2004)** revealed the flavour 7.80 which was similar to present study. The score for texture of pasta was 8.00, 8.50 and 9.00 respectively. The result showed texture of pasta was significantly differ ($P \leq 0.05$) in comparison to other ratios. The texture of pasta was similar to 8.8 reported by **kavitha et al. (2006)**. The score for over all acceptability of was 8.35, 8.87 and 8.97 respectively. Sensory score of pasta was significantly differ ($P \leq 0.05$) in comparison to other ratios. **Agarwal et al. (2004)** revealed the overall acceptability 8.30 which was higher to present study.

Table-1 Organoleptic Evaluation of Rice Based Pasta Incorporated with Soy Flour With 05% Spinach Powder

| Treatment | Colour | Taste | Flavour | Texture | Over all acceptability |
|------------------------------|--------|-------|---------|---------|------------------------|
| RF:SF:SP 75:20:05 | 8.90 | 8.50 | 8.00 | 8.00 | 8.35 |
| RF:SF:SP 80:15:05 | 9.00 | 9.00 | 8.80 | 8.50 | 8.87 |
| RF:SF:SP 85:10:05 | 9.00 | 9.00 | 8.90 | 9.00 | 8.97 |
| CD(P≤0.05) | 0.344 | 0.534 | 0.363 | 0.331 | 0.350 |

IV. Conclusion – Celiac disease is common intestinal disorder which can be treated only through strict gluten free diet. Gluten is the main component of wheat and other cereal flours. The replacement of gluten in the foods leads to many major changes in the quality of the product Pasta is popular breakfast cereal now in days and one bowl of pasta gives good source of energy, protein, iron and calcium to fulfill the requirement. Rice pasta of 10 per cent soy flour with spinach powder was good consumer acceptability with good nutritional value and to solve the problem of celiac disease.

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