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Physico-chemical, sensory quality of whole wheat based pasta incorporated with defatted soy flour and spinach powder

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ABSTRACT

Pasta was prepared from whole wheat flour, defatted soy flour with spinach powder (WWF:DSF:SP). Soy flour was incorporated with 10, 15, and 20 per cent and spinach powder 5 per cent in all combinations on the basis of sensory evaluation. The flour pasta was improved in nutrient content of moisture, protein, ash, fibre, carbohydrate, fat, iron, calcium of the pasta. 10 per cent defatted soy flour pasta was found best with regard to nutrient content and sensory characteristics.

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Key Words : Pasta, Whole wheat flour, Soy flour, Spinach powder

INTRODUCTION

Consumer interest in the relationship between diet and health has increased the demand for information on functional foods. 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 in 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. Therefore, there have been many studies to supplement pasta with protein rich in lysine, such as soy protein (Paulson, 1961; Calusi, 1971 and Siegel *et al.*, 1975). Pasta products such as macaroni, spaghetti, noodles are very popular in Europe and in the western hemisphere. However, the consumption of the convenience food is increasing rapidly with the advance in economic condition of developing countries too. In India, use of pasta products are increasing steadily. Pasta products are good source of carbohydrate and moderate source of proteins, but some essential amino acids and fibre content are low (Sowbhgya and Ali, 2001). 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. Soybean is one of the nature's wonderful nutritional gifts. It is one of the very few plants those provides a high quality protein with minimum saturated fat. Soybean helps people feel better and live longer with

an enhanced quality of life. Soybean contains all the three macronutrients required for good nutrition as well as fibre, vitamins, minerals. Soybean protein provides all the essential amino acids in the amounts needed for human health. Soybean is the most economical source of proteins available. It also fits in amino acid profile that allows substitution without sacrificing nutrition (Langsdorf, 1981).

METHODOLOGY

Soy flour and whole wheat flour were purchased from the local market and spinach leaves was also purchased from the local market and cleaned, washed, dried (hot oven 75°C for 5 hour) and after drying, ground the leaves, then sieved in 20 mesh sieves then produced powder. Spinach powder was incorporated with whole wheat flour at different levels 03, 05, 07, 10 per cent to standardize the level of spinach powder to make pasta and cooked with organoleptic evaluation by semi skilled panel. On the basis of overall acceptability, 5 per cent spinach powder was acceptable. Pasta was prepared with the help of the pasta making machine (La man farina, Italy). Pasta contained whole wheat flour, soy flour and spinach powder in different blends (85:10:05, 80:15:05 and 75:20:05).

Proximate analysis:

Pasta prepared from different blends were analyzed for their proximate composition using standard method of AOAC (1995).

Organoleptic evaluation:

Sensory quality like colour, flavour, texture, taste and overall acceptability of pasta was evaluated by semi-skilled panel by using 9 point hedonic scale.

Statistical analysis:

The data were statistically analyzed by one way ANOVA test.

OBSERVATIONS AND ASSESSMENT

Proximate analysis Table 1 shows WWF: DSF:SP (75:20:05, 80:15:05 and 85:10:05) pasta of moisture was 6.9 to 9.49 per cent. Moisture of 75:20:05 ratio pasta was non-significantly different from 85:10:05 pasta and significantly differed from 80:15:05 pasta. Midha and Mogra (2007) reported that moisture was 6.9 to 7.7 per cent of WWF (whole wheat flour), MWF (malted wheat flour) and MGS (malted wheat flour+green gram dhal+spinach powder) vermicelli and showed slightly lower values to the present findings. Crude protein was 13.44 to 14.55 per cent and 75:20:05 pasta was non-significantly different ($P=0.05$) with 85:10:05 pasta and significantly different from 85:10:05. Addition of 10 per cent soy flour, almost reduces 60 per cent usage of eggs in case of egg noodles and do not provide higher protein content but also improve the amino acid balance as revealed by Itapu (2003). The crude protein was quite similar to 13.75 to 14.83 per cent of noodles which was used 10-40 per cent

millet flour in *Aestivum semolina*, as revealed by Agarwal *et al.* (2004). Crude fat was 0.4 to 0.6 per cent and significantly differed ($P=0.05$) with other ratios. Midha and Mogra (2007) reported crude fat of vermicelli 1.2 to 2.7 per cent which was quite higher to the present study while working with MGS (Malted wheat flour: green gram dhal: spinach powder). The crude fat 1.07 to 3.48 of noodles was quite higher to present investigation as revealed by Agarwal *et al.* (2004). Crude fibre was 13, 12.84 and 12.24, respectively. The result showed that crude fibre of 75:20:05 pasta was non-significantly different from 85:10:05 pasta. Midha and Mogra (2007) reported crude fibre 2.2 to 2.4 per cent of vermicelli which was lower to the present study. The crude fibre of pasta was quite lower to 9.2 per cent of noodles. Ash was 2.4, 2.2 and 1.6 per cent, respectively and 75:20:05 pasta was non-significantly different from 85:10:05 pasta. Midha and Mogra (2007) reported ash was 2.9 to 5.8 per cent of vermicelli which was quite higher to the present study. Carbohydrate of pasta was very quite different and non-significantly different from other ratios. Starch of all groups was quite similar and non-significantly different. In present investigation, it was lower to 35.53 to 40.10 as reported by Kavitha *et al.* (2006). Calcium was 124-127 mg per 100 g and non-significantly different to other ratios. The results are lower from the findings of Midha and Mogra (2007) and also lower values (Kavitha *et al.*, 2006). Iron of was in range of 12-12.3 mg, and non-significantly different. The results are lower with the findings by Midha

Table 1 : Proximate composition of wheat based pasta incorporated with soy flour with 05% spinach powder

Treatments	Moisture (%)	Crude protein (%)	Crude fat (%)	Crude fibre (%)	Ash (%)	Carbohydrate (%)	Starch (%)	Calcium (mg/100g)	Iron (mg/100g)
WWF:DSF:SP 75:20:05	6.99	14.55	0.80	13.00	2.40	62.26	16.60	127.00	12.30
WWF:DSF:SP 80:15:05	7.83	13.86	0.60	12.84	2.20	62.67	16.40	125.00	12.02
WWF:DSF:SP 85:10:05	9.49	13.44	0.40	12.24	1.60	62.83	16.20	124.00	12.00
C.D. ($P=0.05$)	1.421	0.840	0.041	0.694	0.767	2.377	0.422	5.34	0.718

Table 2 : Organoleptic evaluation of wheat based pasta incorporated with soy flour with 05 per cent spinach powder

Treatments	Colour	Taste	Flavour	Texture	Over all acceptability
WWF:DSF:SP 75:20:5	6.90	7.00	7.50	8.00	7.20
WWF:DSF:SP 80:15:5	7.00	7.60	7.80	8.00	7.60
WWF:DSF:SP 85:10:5	7.00	7.60	8.00	8.00	7.60
C.D. ($P=0.05$)	0.542	0.487	0.403	0.363	0.216

and Mogra (2007).

Organoleptic evaluation:

Table 2 showed the score for colour was 6.9 to 7 and non-significantly different. In the present study, pasta of colour was quite lower to 8.9 as reported by Kavitha *et al.* (2006). Taste was 7 to 7.6 and significantly different (P=0.05) in comparison to other ratios. Midha and Mogra (2007) reported the taste 7.5 to 7.9 which was quite similar to the present study. The flavour was 7.5 to 8.0. The result showed that flavour of 75:20:05 pasta was non-significantly different (P=0.05) in 85:10:05 pasta. The flavour of pasta was quite similar (8.8) as reported by Kavitha *et al.* (2006). Agarwal *et al.* (2004) revealed the flavour as 7.80 which was similar to the present study. The score for texture of pasta was 8. The result showed that texture of pasta was non-significantly different (P=0.05) in comparison to other ratios. The texture of pasta was similar to 8.8 as reported by Kavitha *et al.* (2006). The score for over all acceptability of was 7.2, 7.6 and 7.6, respectively. The sensory score of pasta was significantly different (P=0.05) in comparison to other ratios. Agarwal *et al.* (2004) revealed the overall acceptability 8.30 which was higher to the present study.

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LITERATURE CITED

- Agarwal, P., Singh, G. and Srivastava, S. (2004).** Effect of incorporating foxtail millet (*Setaria italica*) on the cooking characteristics of noodles. *Beverages & Food World*, 18 -19.
- AOAC. (1995).** *Official methods of analysis*. Association of official Analytical Chemists Inc., Arlington USA.
- Chung, H.Y., Rasmussen, H.M. and Johnson, E.J. (2004).** Lutein bioavailability is higher from lutein-enriched eggs than from supplements and spinach in men. *J. Nutrition*, 134(8): 1887-1893. PMID:15284371.
- Clausi, AS. (1971).** Cereal grains as protein sources for developing highly acceptable high-protein foodsvaise apko sab pata hai. *Food Technol.*, 25:63-67.
- Itapú, Suresh (2003).** Soy flour in bakery food products. *Processed Food Industry*. pp. 36-40.
- Kavitha, B., Kanchana, S., Vennila, P. and Kumar, S. (2006).** Development of extruded products using soya meal maker flour. *Soya Update*, 3(5):1-6.
- Langsdrof, A.J. (1981).** Economic of soya protein products and outlook. *JACOS.*, 58(3):338-340.
- Midha, S. and Mogra, R. (2007).** Quality evaluation of value added vermicelli. *J. Food Science Tech.*, 44 (2): 220–223.
- Paulson, T.M. (1961).** A study of macaroni products containing soy flour. *Food Technol.*, 15:118-121.
- Siegel, A., Bhumiratana, A. and Lineback, D.R. (1975).** Development acceptability and nutritional evaluation of high protein soy supplemented rice noodles for children. *Cereal Chemistry*, 52: 801-811.
- Sowbhagya, C.M. and Ali Zakiuddin, S. (2001).** Vermicelli noodles and their quality assessment. *J. Food Sci., & Technol.*, 38(5): 423-432.

