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Organoleptic Evaluation of Value Added Products Prepared from Fresh Cauliflower Outer Leaves and Stems

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Abstract – **Green leafy vegetables occupy an important place among the food crops as these provide adequate amounts of many vitamins and minerals for humans. They are rich source of ascorbic acid, riboflavin, folic acid and minerals like calcium, iron and phosphorus. Health promoting Brassicaceae vegetables are major antioxidants due to their high Vitamin C and phenolic contents. This study is therefore being under-taken to formulate products by the incorporation of fresh cauliflower and cabbage outer leaves and stems, so their benefits can be available by including them in our daily dietaries. Two food products parantha and mathri were prepared by the incorporation of fresh cauliflower outer leaves and stems, the basic recipe of each product without incorporation of fresh cauliflower served as control the organoleptic evaluation of the products with regard to attributes of colour and appearance, body and texture, taste and flavour and overall acceptability were done using "Nine Point Hedonic Scale". Sensory evaluation of parantha with and without incorporation of fresh grated cauliflower stems showed that the overall acceptability was highest in T_1 (8.6) followed by T_0 (8.3), T_2 (7.6) and T_3 (7.1) are respectively and there was a significant difference, ($P<0.05$) between the control and treatments. The overall acceptability of T_1 was significantly better than control (T_0). Sensory evaluation of mathri with and without incorporation of fresh grated cauliflower stems showed that the overall acceptability was highest in T_1 (8.5) followed by T_0 (8.3), T_2 (7.7) and T_3 (7.0) respectively and there was a significant difference, ($P<0.05$) between the control and treatments. The overall acceptability of T_1 was significantly better than control (T_0).**

Keywords – **Value Added Product, Organoleptic, Analysis, Cauliflower.**

I. INTRODUCTION

Green leafy vegetables occupy an important place among the food crops as these provide adequate amounts of many vitamins and minerals for humans. They are rich source of ascorbic acid, riboflavin, folic acid and minerals like calcium, iron and phosphorus. There is a general belief among nutritionists and health professionals that the health benefit of vegetables should not be linked to any one compound or one type of vegetables, but rather a balanced diet that includes more than one vegetable is likely to provide better protection. All the vegetables may offer protection to humans against chronic diseases. With the exception of glucosinolates and thiosulfides, which are unique to the crucifers and alliums, the phytonutriceuticals content of a number of vegetables consist primarily of vitamin C, fiber, selenium, folate and polyphenolics (carotenoids and flavonoids). The main difference is that each vegetable group contains a unique combination and amount of these phytonutriceuticals, which distinguishes them from other groups and vegetables within their own group. The food processing industry produces large quantities of waste products. Over one million tonnes of vegetable trimmings from the vegetable processing industry are produced every year which can be used for value addition. They are inexpensively available in large quantities characterized by a high dietary fibre content resulting with high water binding capacity and relatively low enzyme digestible organic matter (Serena and Bach-Knudsen, 2007). Today's society, in which there is a great demand for appropriate nutritional standards, is characteri--zed by rising costs and often decreasing availability of raw materials together with much concern about environmental pollution. Consequently there is a considerable emphasis on the recovery, recycling and upgrading of wastes. This is particularly valid for the food and food processing industry in which wastes, effluents, residues, and byproducts can be recovered and can often be upgraded to higher value and useful products (Laufenberg *et al*., 2003). Domestic use or export of fresh or processed fruits and vegetables leave huge amounts of wastes, which are being ploughed back into the field and act as soil conditioner, or are left on the road side posing great threat to the environment. Otherwise, if used judiciously, these wastes may serve as good sources of nutrients for livestock (Wadhwa *et al.*, 2006). Many by-products may be useful as source of nutrients and potentially functional ingredients, giving the opportunity to obtain added value products. There is then a necessity to first study the composition of every by-product and its potential for future use (Dominguez Perles *et al*., 2010).

II. METHODS AND MATERIALS

2.1 *Procurement of Raw Materials: -*

The raw materials for the product development were collected from the Women's Hostel kitchen of SHIATS. Upper stem, stalks and leaf midribs of white cauliflower by-products were used in this investigation.

2.2 *Experimental site: -*

The present investigation was carried out in the Nutrition Research, Laboratory of the Department of Foods and Nutrition, Ethelind School of Home Science, SHIATS, Allahabad.

2.3 *Development of Food Products: -*

Two food products *(Parantha, and mathri)* were prepared with fresh cauliflower outer leaves and stems. For

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each product, the basic recipe (control T_0) had three variations, T_1, T_2, T_3 respectively, where the amount of one or more ingredients was varied.

2.4 *Sensory Evaluation* –

Sensory evaluation of the food products for their acceptability was done by a panel of 5 judges. The score card based on the 9 point Hedonic Scale was used for sensory evaluation on the basis of evaluation of attributes like Colour and Appearance, Body and Texture, Taste & Flavour and Overall Acceptability (Shrilakshmi, 2010).

2.5 *Statistical Analysis* -

Analysis of variance technique (ANOVA), Critical Difference and t-test were used to analyse the data (Gupta and Kapoor, 2002).

III. Results and Discussion

The results of sensory evaluation of parantha and mathri prepared with fresh cauliflower outer leaves and stems are listed in (table 1 and table 2).

PARANTHA

Colour and Appearance

Table 1 shows that the mean sensory scores of *parantha* in relation to colour and appearance indicates that T_1 had the highest score 8.7 followed by T_0 (8.2), T_2 (8.0) and T_3 (7.3). It is quite obvious from the table that the treatment T_1 (*wheat flour*+ fresh grated cauliflower stem) was liked very much whereas treatment T_3*wheat flour* + fresh grated cauliflower stems was liked moderately regarding the colour of *parantha.*

Body and Texture

Table.1 shows that the mean sensory scores of *parantha* in relation to body and texture indicates that T_1 had the highest score 8.5 followed by T_0 (8.3), T_2 (7.4) and T_3 (6.8). It is quite obvious from the table that the treatment T_1 (*wheat flour*+ fresh grated cauliflower) was liked very much whereas treatment T_3 of *wheat flour* + fresh grated cauliflower stems was liked moderately regarding to body and texture of *parantha*

Taste and Flavour

Table.1 shows that the mean sensory scores of *parantha* in relation to taste and flavour indicates that T_1 had the highest score 8.6 followed by T_0 (8.3), T_2 (7.6) and T_3 (7.1). It is quite obvious from the table that the treatment T_1 (*wheat flour*+ fresh grated cauliflower stems) was liked very much whereas treatment T_3 (*wheat flour* + fresh grated cauliflower stems) at the ratio 100:25 of wheat flour+ fresh grated cauliflower was liked moderately regarding the taste and flavour of *parantha.*

Overall Acceptability

Table.1 shows that the mean sensory scores of *parantha* in relation overall acceptability indicates that T_1 had the highest score 8.6 followed by T_0 (8.5), T_2 (7.4) and T_3 (7.2). It is quite obvious from the table that the treatment T_1 (*wheat flour*+ fresh grated cauliflower stems) was liked very much whereas treatment T_3 (*wheat flour* + fresh grated cauliflower stems) at the ratio 100:25 of wheat flour+ fresh grated cauliflower was liked moderately regarding to overall acceptability. Abul-fadl (2012) reported that beef sausage trial containing the upper stem flour at level of 7.5% had the highest sensory scores especially for appearance, taste, tenderness, juiciness, and overall acceptability, followed by trials containing leaf midrib flour at level of 2.5 and 5% as compared with other trials.

MATHRI

Colour and Appearance

Table 2 shows that the mean sensory scores of *mathri* in relation to colour and appearance indicates that T_1 had the highest score 8.5 followed by T_0 (8.4) T_2 (7.8) and T_3 (7.1). It is quite obvious from the table that the treatment T_1(white refines flour+ fresh grated cauliflower stems) was liked very much whereas treatment T_3*wheat refined flour* + fresh grated cauliflower stems was liked moderately regarding the colour and appearance of *mathri*

Body and Texture

Table.2 shows that the mean sensory scores of *mathri* in relation to body and texture indicates that T_1 had the highest score 8.4 followed by T_0 (8.2), T_2 (7.5) and T_3 (7.0). It is quite obvious from the table that the treatment T_1 (*white refined flour*+ fresh grated cauliflower stems) was liked very much whereas treatment T_3 of *white refined flour* + fresh grated cauliflower stems was liked moderately regarding the body and texture of *mathri.*

Taste and Flavour

Table.2 shows that the mean sensory scores of *mathri* in relation to taste and flavour indicates that T_1 had the highest score 8.6 followed by T_0 (8.4), T_2 (8.0) and T_3 (6.9). It is quite obvious from the table that the treatment T_1 (*white refined flour*+ fresh grated cauliflower stems) was liked very much whereas treatment T_3(*white refined flour* + fresh grated cauliflower stems) at the ratio 100:25 of wheat flour+ fresh grated cauliflower was liked moderately regarding the taste and flavour of *mathri.*

Overall Acceptability

Table2 shows that the mean sensory scores of *mathri* in relation overall acceptability indicates that T_1 had the highest score 8.5 followed by T_0 (8.3), T_2 (7.7) and T_3 (7.0). It is quite obvious from the table that the treatment T_1 (*wheat refined flour*+ fresh grated cauliflower stems) was liked very much whereas treatment T_3(*wheat refined flour*+ fresh grated cauliflower e stems) at the ratio 100:25 of *wheat refined flour* + fresh grated cauliflower stems was liked moderately regarding to overall acceptability. The same result was found in the study conducted by Kaveri et.al (2004) that papad containing highest per cent of defatted soy flour obtained lowest scores. Swati Verma et.al (2012) also reported the same results fresh vegetable mathri. According to the results, the fresh vegetables mathri showed the highest overall acceptability i.e. 7.8 ± 0.19 and the score was fall in the range of like very much.

References

[1] Abul Fadl, M.M., (2012).Nutritional and Chemical Evaluation of White Cauliflower by- Products Flour and the Effects of its addition on Beef Sausage Quality. Journal of Applied Sciences Research, 8(2): 693-704.

[2] Domínguez-Perles, R., M.C. Martínez - Ballesta, M. Carvajal, C. García - Viguera and D.A. Moreno, 2010. Broccoli - derived by - products -a promising source of bioactive ingredients. Journal of Food Science, 75(4): C383- C392.

[3] Gupta, S.C. and Kapoor, V.K. (2007),Fundamentals of applied st-

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-atistics 4th revised edition, Chand & Son, pp: 5.1-5.50.

[4] Kaveri, G.V., Gupta, S., Lakshmi, J.A. and Prakash, J.2004. Physiochemical characteristics and sensory attributes of wheat-based "Papads" incorporated with green leafy vegetables. Journal of Food Quality 27: 459 - 470.

[5] Laufenberg, G.,B. Kunz and M. Nystroem, 2003. Transformation of vegetable waste into value added products: (A) the upgrading concept; (B) practical implementations. Bio resource Technology, 87:167-198.

[6] Serena A, Bach-Knudsen KE (2007). Chemical and physicochemical characterization of co products from vegetable food and agro industries. Animal Feed Science and Technology 139:109-124.

[7] Shrilakshmi, B. (2010). "Food Science" New Age International (P) Limited Publishers, Pp-172.

[8] Swati Verma and Shashi Jain (2012).Fortification of Mathri with Fresh and Dehydrated Vegetables and Assessment of Nutritional quality. The Rajasthan Journal of Extension Education, 20: 155-158.

[9] Wadhwa, M.,S. Kaushal and M.P.S. Bakshi, 2006. Nutritive evaluation of vegetable wastes as complete feed for goat bucks. Small Ruminant Research, 64: 279-284.

Table1. Average sensory score of different parameters in control and treated sample of fresh cauliflower "*Parantha*".

Parameters	T_0	T_1	T_2	T_3	Result
	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE	
Colour and appearance	8.2 ± **0**	8.7 ± **0.07**	8 ± **0.11**	7.3 ± **0.70**	S
Body and texture	8.3 ± 0.07	8.5 ± **0.07**	7.4 ± **0.37**	6.8 ± **0.27**	S
Taste and flavour	8.5 ± **0.070**	8.6 ± **0.08**	7.4 ± **0.20**	7.2 ± **0.14**	S
Overall acceptability	8.3 ± **0.12**	8.6 ± **0**	7.6 ± **0.12**	7.1 ± **0.07**	S

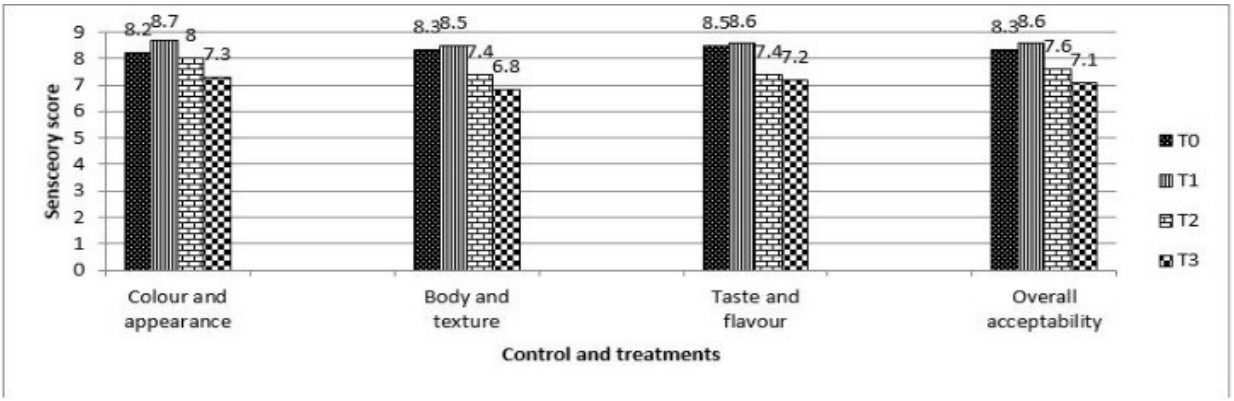

Fig.1. Average sensory score of different parameters in control and treated sample of fresh cauliflower "*Parantha*.

Table 2. Average sensory score of different parameters in control and treated sample of fresh grated cauliflower "*mathri*".

Parameters	T_0	T_1	T_2	T_3	Result
	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE	
Colour and appearance	8.4 ± **0.08**	8.5 ± **0.07**	7.8 ± **0.27**	7.1 ± **0.17**	S
Body and texture	8.2 ± **0.11**	8.4 ± **0.18**	7.5 ± **0.34**	7.0 ± **0.17**	S
Taste and flavour	8.4 ± **0.24**	8.6 ± **0.17**	8.0 ± **0.30**	6.9 ± **0.17**	S
Overall acceptability	8.3 ± **0.09**	8.5 ± **0.12**	7.7 ± **0.23**	7.0 ± **0.18**	S

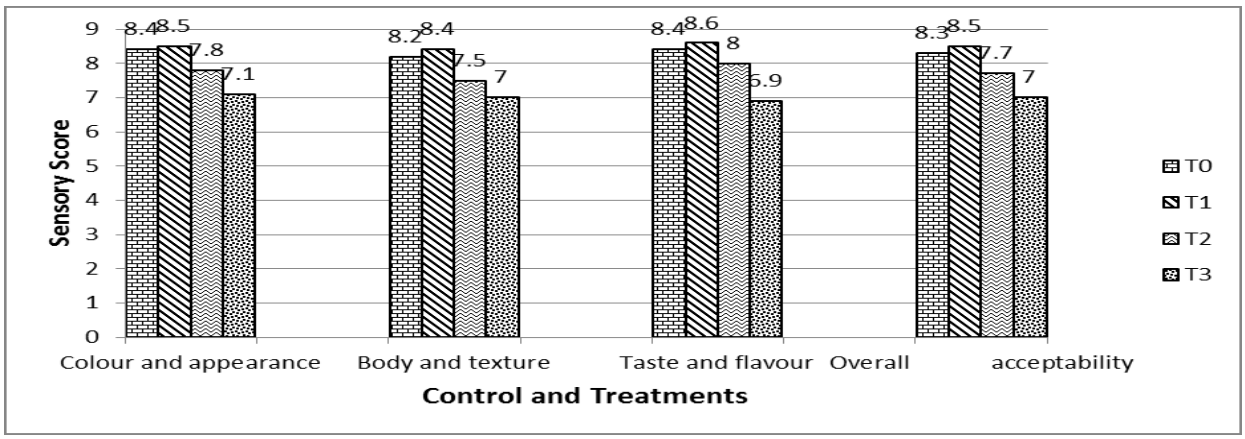

Fig. 2. Average sensory score of different parameters in control and treated sample of fresh grated cauliflower "*mathri*"

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