

Sensory Evaluation of Nutritionally Potential High Protein Low Glycemic Index Noodles

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Abstract: Choosing to eat high-quality foods is more and more often becoming a lifestyle choice, and consumers look for new types of food that meet their expectations. As the perception of low glycemic index foods is gaining attention for the precise management of diabetes mellitus, efforts have been concentrated in this direction to fetch into light several foods of low glycemic index. Noodles are most favored food items among all age groups, having extensive shelf life and good marketable importance. In view of the above, in the current study, an effort was made to develop value added healthy noodles made with low glycemic index high protein ingredients like green gram flour, kidney bean flour etc. to replace the commercial noodles which are made with high glycemic index refined flour. Five different varieties of high protein low glycemic index noodles were prepared. Further evaluation of the sensory attributes and shelf-life of the low GI noodles revealed that the noodles prepared using the combination of green gram flour and wheat flour rated the maximum by the consumers and the product has shelf-life of three months without losing any organoleptic properties.

Index Terms: glycemic index, innovative idea, noodles, sensory evaluation, value added

I. INTRODUCTION

Today there is a substantial change in the lifestyle of people due to the fast industrialization, advanced socio-economic status, improved health amenities and long life expectancy. Economic prosperity together with sedentary lifestyles and shift in food patterns are causative to several chronic degenerative diseases such as diabetes mellitus, cardiovascular diseases, cancer, etc. Diabetes mellitus is a prominent disease and is now accepted as one of the widest growing threats to public health in almost all countries of the world (Anna & Marzena 2016, Ben & Alpert 2015, Surekha *et al* 2013).

Dietary variation, weight control and steady exercise are the main tactics in controlling diabetes, diet being the corner stone. Novel research findings in this area specify the potential assessments of diets in prevention of such disorders. Low glycemic index ingredients are now receiving consideration due to beneficial their consequence on human nutrition and health (Bharath Kumar & Prabhasankar 2017). Low glycemic index ingredients are those, which digest gradually and also release glucose into the blood steadily during absorption. Currently, the task is to identify hypoglycemic diet compliments to control blood glucose levels. As foods with low glycogenic index (GI) are well-known to result in low post-prandial glucose response in patients with non-insulin dependent diabetes mellitus, GI has been widely studied as a valuable means to identify foods that are suitable for diabetic people (Bora & Kulshrestha 2014, Khan *et al* 2009).

Noodles are commonly consumed throughout the world and their global utilization is second after bread because of its simplicity of preparation and deliciousness. It is consumed by maximum population regardless of age, region and life-style. As noodles are primarily made using refined wheat flour, it is not advisable for the people with diabetes because of its high glycemic index (GI) effect (Porwal *et al* 2014, Sardesai *et al* 2013). Noodles with a high GI breakdown more rapidly and result in a quick rise in blood sugar levels. Integration of low glycemic index components to these noodles will lower the glycemic response due to increase in the dietary fibre and protein content. The proposed innovative idea is to make noodles with low GI high protein ingredients so as to promote the awareness and understanding of the glycemic index and the benefits of lowering the average GI of the diet to manage diabetes and other chronic lifestyle related diseases (Archana & Singh 2016, Bharath Kumar & Prabhasankar 2018, Guinéet *al* 2016, Ofuya & Akhidue 2005).

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The incorporation of beans in the human diet offers an outstanding source of protein and dietary fiber and has potential for lowering glycemic load (Bharath Kumar &Prabhasankar 2016). In the current work, noodles were made with pulses such as Green gram flour, Kidney bean flour and finger millet flour, flour of mixed pulses along with nutritional enhancer like mushroom & soy flour. It also helps in expanding the diet pattern as some of the consumers are reluctant to consume these in its native form.

II. MATERIALS & METHODS

A. Raw Materials

Kidney beans, Finger Millet flour, wheat flour, Soya chunks and Mushroom were purchased from the local market.

B. Methods

The five different varieties of noodles prepared were Variety 1 (2:1; Green gram flour + Wheat flour), Variety 2 (2:1; Wheat flour + Mushroom paste), Variety 3 (2:1; Kidney Bean Flour + Wheat flour), Variety 4 (2:1; Finger Millet + Wheat flour) and Variety 5 (Mixed flour).

Prepare the dough by mixing the above ingredients and salt using water



With the help of manual noodle making machine, make fine noodles from the dough



Grease the baking tray, bake at 220°C for 20 min

C. Sensory evaluation

The product development will be successful only when it is accepted by the consumer. Sensory evaluation was undertaken with fifty members of age group 20-60 years. The experimental study consent was taken from all the subjects participated in the sensory evaluation of the product. Developed products were evaluated for sensory attributes such as color, texture, flavour, taste and overall acceptability (Kaur & Kaur 2019).

D. Shelf-life study

The various noodles prepared were stored at room temperature and sensory evaluation was carried out for every month up to a period of four months.

III. RESULTS & DISCUSSION

The number of low-GI diet is very inadequate, and broader range of low-GI products will be essential to make a well-balanced low-GI diet practicable (Bharath Kumar & Prabhasankar 2015, Mamata *et al* 2012, Nazni & Singh 2014). The objective of this work was to make noodles by substituting refined flour alone or in combination with flour made from

pulses, to achieve a nutritious, fibre rich low glycemic index noodles (Fig-1). Comparison of sensory attributes (Colour, Texture and Flavour) between the five different varieties of noodles is shown in Fig- 2.a-c.



Fig-1: High protein low GI noodles

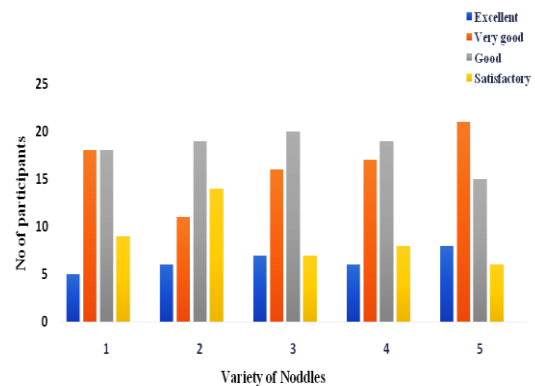


Fig- 2a: Comparison of the colour attributes

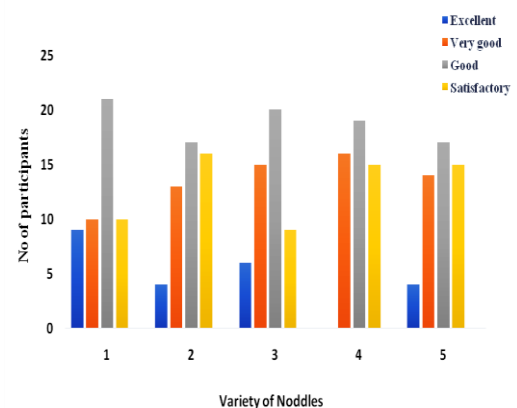


Fig- 2b: Comparison of the texture attributes

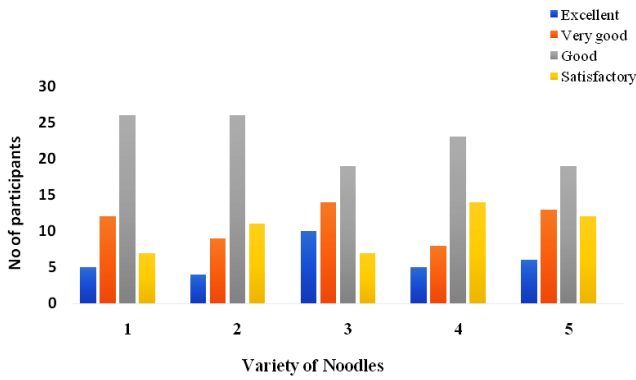


Fig- 2c: Comparison of the flavour attributes

The results of sensory evaluation (Fig- 3 a-e) revealed that the Variety 1 noodles scored the maximum although the other varieties were also liked by the consumers. Thus, value addition of functional nutrition ingredients such as pulse flour has supported the value-added noodles under low GI group of foods effectively.

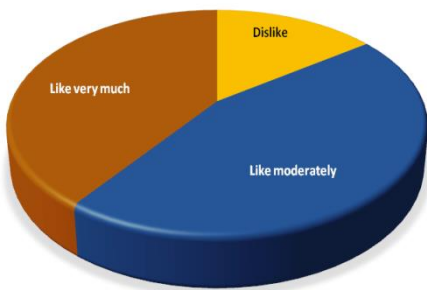


Fig- 3a: Sensory Evaluation of Variety 1 noodles

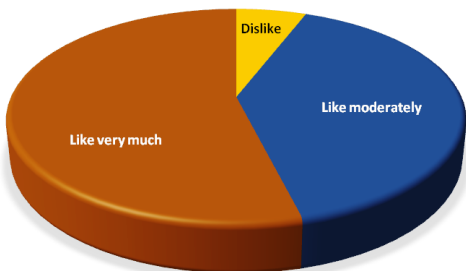


Fig- 3b: Sensory Evaluation of Variety 2 noodles

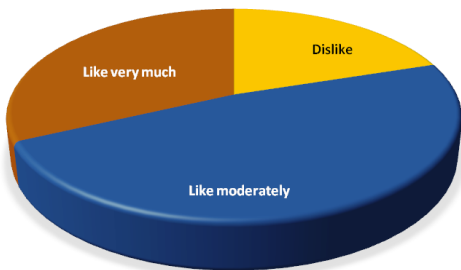


Fig- 3c: Sensory Evaluation of Variety 3 noodles

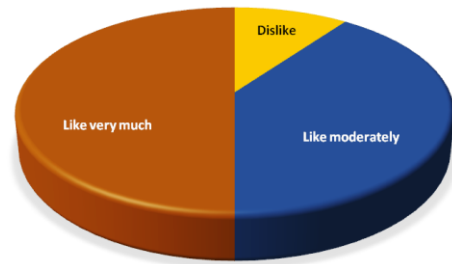


Fig- 3d: Sensory Evaluation of Variety 4 noodles

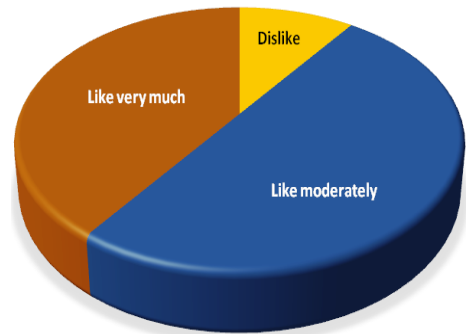


Fig- 3e: Sensory Evaluation of Variety 5 noodles

Although all the different varieties of noodles tested for the flavour attributes scored approximately the same score, Variety 1 noodles scored the maximum as these noodles were made from Green Gram flour which imparts good aroma while baking. Results of sensory attributes of the various noodles prepared in the present study are in tune with the previous research findings (Jood 2015, Kumar &Prabhasankar 2016, Devi *et al* 2011, Durgadevi &Nazni 2012). The various noodles prepared retained its organoleptic properties up to the test period of three months.

CONCLUSION

The increasing market of specialized food products shows that the ultimate users are seeking minimal processed food with additional nutritional values. Future demand of specialized food products depends on consumers perception of the relationship between diet and disease. The aim of this present study is to prepare specialized and value-added food products which can supplement to the normal diet. Taking the above facts into account with the health benefits offered by the various ingredients, product like low glycemic index protein rich noodles was made. Since all the materials used in the above-mentioned products are nutritionally well known, the acceptance by the consumer was satisfactory. It was found through sensory evaluation study that Green Gram noodles was the most liked product on a 9-point hedonic scale. Through this study, it can be concluded that there is a very extensive variety of approaches that can be used to amend food products so as to accomplish desirable health benefits. The future scope of the work includes the use of other pulses for the development of

low glycemic index protein rich noodles and to enhance the nutritional value through the incorporation of iron- rich ingredients like dry fenugreek leaves, drumstick leaves etc. so as to combat the anemia among adolescent girls.

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