Sensory evaluation and acceptability of noodles prepared from different food items

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■**ABSTRACT :** Noodles are no longer an alien food in India. An Indian Market Research Bureau report stated that 45 per cent of all household consume noodles. Thus, the present work is an attempt to increase the nutritive value of noodles, which is now becoming a favourite food item for children as well as adults. In this work, lack of nutrients in noodles has been compensated by adding a variety of cereal flours, vegetables and pulses and was prepared by using extrusion technology. After that sensory evaluation was performed by panel members. It was found that noodle prepared from Rajmah (kidney bean) with base cereal (mixture of refined flour and semolina) was most acceptable and has good nutritive value.

■**KEY WORDS:** Noodles, Nutrient, Sensory evaluation

Noodle is a type of food with a thin and elongated shape made from unleavened dough by using extrusion technology and usually cooks in boiling liquid. Noodles are widely consumed throughout the world and their global consumption is second only to bread (Kulkarni *et al.,* 2012). The increasing awareness among consumers about the nutritional value of foods prepared by using natural ingredients and consumed with convenience, has stimulated researchers to develop products of high nutritional value. Thus, this work is an attempt to develop and determine acceptability of the noodles prepared from different pulses and vegetables having good nutritional value. Cereals such as wheat flour, rice flour, maize flour, semolina, vegetables like spinach, cabbage and pulses such as kidney beans and lentil were selected for the preparation of different types of noodle. Spinach has always been an excellent food because of its high vitamin A, vitamin C, iron and valuable protein content (Brune and Dunkenberger,1970). It is filled with anti-oxidants. Cabbage is a flavourful cruciferous vegetable rich in a variety of essential nutrients. It has low calorie, little protein and no fat but contains fibre, antioxidants, vitamins and minerals. According to The World's Healthiest Foods, it is an excellent source of vitamin C and K. It is a good source of manganese, vitamin B_6, folate, vitamin B_1 and B_2, calcium, potassium, vitamin A and magnesium. Cabbage contains trace amounts of iron, zinc and manganese. It prevents obesity and related complication. Kidney bean is best source of protein and also elevates circulating cholecystokinin and stimulates enzyme secretion in body (Grant *et al.,* 2000). The high soluble fibre in kidney beans helps to eliminate cholesterol from the body. Lentils are economical food that is served the world. There are numerous varieties of lentils and all of these varieties are good source of protein, iron, folic acid and soluble fibre. It helps in reducing the risk of coronary heart disease and diabetes.

This study was undertaken to develop a variety of noodles enriched with addition of different cereals, vegetables and pulses. Prepared products were sensory evaluated for determining the acceptability. Nutritive value of the acceptable product was assessed in CFT (Centre of Food Technology), Allahabad.

Noodles are prepared in two phases:
Firstly, it is prepared by using only cereals for selecting

the base for further variation. Wheat flour, semolina, maize flour and rice flour were selected as are easily available at a reasonable cost. Five samples were prepared in which one sample was made of refined flour, served as control and other four test samples were prepared by incorporating selected cereals with refined flour in the proportion, 3: 1.Untrained panel members were selected to sensory evaluate the prepared noodles. Numeric scoring test was used for the evaluation of overall acceptability and quality of product. The selection of cereal noodle for further variation was done by calculation of highest score. In the second step, kidney bean and lentil were selected for incorporation because of their high protein content. Spinach and cabbage were chosen as children don't like but has high nutritional benefit. Four different variations of noodles were made by incorporating selected pulse (kidney beans or lentil)/ selected vegetable (spinach or cabbage) in most acceptable cereal base in the proportion of 1:1:2 *i.e.* any pulse or any vegetable, semolina and refined flour. Untrained panel members sensory evaluated these noodles and overall product acceptability and quality was determined by using numeric scoring test. The derivation of results and inferences from data involve analysis of variance. The nutritive value of most acceptable noodle has been determined by AOAC techniques in the Centre of Food Technology at Allahabad.

Sample B was control whereas sample A,C,D and E were test samples. All the test samples were more acceptable than the control one. Sample C which was prepared from semolina was most acceptable as it scored highest number, thus,

selected for further variation (Table 1). Semolina is good source of thiamine and folate and very good source of selenium. Semolina supplementation improves considerable fibre, associated with reduced plasma cholesterol and post prandial serum glucose and insulin responses (Sawsan *et al.,* 2010).

Sample A_1 prepared from incorporating kidney beans, semolina and refined flour as further variation, scored highest number and was most acceptable (Table 2). All the four samples had little variance in overall characteristics as F calculated value is less than F tabulated value at 1 per cent and 5 per cent level of significance. Among all the samples Rajmah noodles was found most acceptable and have good nutritive value which was determined through AOAC techniques (Table 3).

Conclusion:

This work is an attempt to develop different types of noodles by incorporating pulses and vegetables to enhance its nutritive value. Kidney bean and lentil were selected as they have high protein content. Spinach and cabbage were selected as they are not liked by children but has high mineral content which is beneficial for growing children. The variations of noodles were prepared by incorporating semolina, refined flour and respective pulse or vegetable in defined proportion. Untrained panel members were selected for sensory evaluation of products by using numeric scoring test. It was found that kidney bean (Rajmah) noodles was most acceptable than the other variations and has good nutrient content.

Table 1 : Total scores of noodles prepared from different cereals

Sample	Sample code	Scores
Wheat flour noodles	A	580
Refined flour noodles	B	550
Semolina noodles	C	620
Maize flour noodles	D	595
Rice flour noodles	E	570

Table 2 : Total and mean scores of noodles prepared from vegetables and pulses

Samples	Sample code	Total scores	Mean *
Rajmah noodles	A_1	810	81
Spinach noodles	B_1	800	80
Cabbage noodles	C_1	730	73
Lentil noodles	D_1	750	75

* Mean = Total score / Total number of panelist

Table 3 : Nutritive value of the most acceptable noodle

	Nutrients per 100 g					
	Protein (g)	Fat (g)	Carbohydrate (g)	Energy (kcal)	Crude fibre (g)	Iron (mg)
Rajmah noodles	8.3	1.27	209.3	885.83	1.77	77.1

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