

Development of Nutritional Snacks (*Sev*) Supplemented with *Horse gram flour* and its Organoleptic Evaluation

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Abstract- Today is world of processed foods (snacks) that are less healthy food. The main aim of the study was development of healthy and nutritious haircare supplement snacks (*Sev*) from various supplementary products like flaxseed flour ,almonds flour ,pumpkinseeds flour ,gram flour , rice flour, horse gram flour curry leaves powder ,moringa leaves puree, carrot puree ,amla puree, beetle leaves puree The main objective to incorporate rice flour is to provide crispiness and instant energy to the sev whereas horsegram flour is excellent source of protein (22.22%), iron (7.03mg/100g) and calcium (mg/100g). It also contains natural phenols, flavonoids and antioxidants. Also spinach puree increases iron content and it is rich source of iron (90mg/100g) and antioxidants (19.80%). The proximate composition of *sev* prepared by incorporating all these raw materials was reported as moisture (2.96%), crude protein (15.33%), crude fat (23.48%), crude fiber (7.66%) and ash (12.877%) content. Total minerals such as calcium were observed as 190.86mg/100g.

Keywords: *Sev*, horsegram flour, spinach puree, flaxseed flour, almonds flour, pumpkinseeds flour, curry leaves powder, moringa leaves puree, carrot puree, amla puree, beetle leaves puree

1. INTRODUCTION

Snack foods are playing a vital role in our day to day life. These are the items eaten for pleasure and during relaxation (Vinothini K, *et al.*, 2015). *Sev* is one of the popular Indian snack food item. It is available in small pieces of crunchy noodles made from chickpea flour paste which is seasoned with turmeric and chilli powder and deep-fried in oil. These noodles vary in thickness. This popular snack being tasty and tempting is simultaneously full of fats as it is deep fried (Raut S. S. and Sengupta R., 2014) [21]. The high oil content is often not essential for product quality and is disadvantageous for both the food processor as well as the consumer. Hence, reducing oil content of these products is an area of interest to researcher (Priya *et al.*, 1996).

As per 'The State of Food Insecurity in the World 2012', India remains home to the largest number of

undernourished people in the world: 217 million (17.5% of its population) as of 2012.

With growing concern of diet, weight control, hair care and general health, government bodies are recommending to the peoples and making a conscious effort to eat healthier, natural snacks such as fruit, vegetable, nuts and cereal grains while avoiding high-calorie, low-calorie nutrient junk food (Raut S. S. and Sengupta R., 2014) [21]. Legumes have been considered as a rich source of protein throughout the world and contain approximately three times more proteins than cereals. Chickpea (*Cicer arietinum* L.) is one of the top five important legumes based on whole grain production (FAO, 2000). It is an important component of the diets of those individuals who cannot afford animal proteins or those who are vegetarian by choice. It is also cholesterol free and a good source of dietary fibre, vitamins, minerals (Jukantil *et al.*, 2012) [13]. Horsegram [*Macrotyloma uniflorum* (L.) Verdc] is an underutilized indigenous legume and one of the highly nutritious vegetable pulse crop with ethno-medicinal values in India, which is commonly known as Kulattha (Sanskrit) (Bhartiya *et al.*, 2015) [5 It is also a good source of thiamine (vitamin B1), riboflavin (vitamin B2) and niacin (vitamin B3) Depa *et al.*, (2008). Spinach has a high nutritional value and is extremely rich in antioxidants. It also contains different carotenoids like lutein, β carotene, violaxanthin and 9'-(Z)-neoxanthin and has high concentration of vitamins like A, E, C, and K. They also possess folic acid and oxalic acid (Kavitha *et al.*, 2013) [14]. Carrots are a particularly good source of beta carotene, fiber, vitamin K1, potassium, and antioxidants (1). They also have a number of health benefits. They're a weight-loss-friendly food and have been linked to lower cholesterol levels As published in (9 biotin-rich foods to add to your diet (medicalnewstoday.com), Almonds are a strong source of biotin, and their benefits for hair are always expanding. Flaxseed is a good source of protein, fiber, biotin In the light of above

discussions, a study was carried out for the development of healthy snack product

OBJECTIVE

The main objective of the study is to develop a healthy and nutritional snack sev to compensate the use of hair care supplements such as biotin tablets etc., by providing all vital nutrients for hair growth in the sev prepared.

2. MATERIALS AND METHODOLOGY

Ingredients used in the development of nutrient rich Sev were of good quality and free from contamination. All the ingredients were procured from the local market of Chennai. The main ingredients used were Chickpea flour, Horsegram flour, Flaxseed flour, almond flour, Curry leaves, Carrot, amla Spinach, Salt, Spices (Chilli powder, ajwain), Edible vegetable oil and Water. The main equipments used are an electronic weighing balance, soxhlet extractor and Hot air oven. The equipments used were from Department of Food Science laboratory at M.O.P.Vaishnav College for Women, Chennai

2.1 Preparation of Spinach, amla and carrot puree

- Fresh spinach leaves, amla and carrot were collected from local market followed by sorting of leaves, peeling of carrots and chopping of amla.
- They were washed properly and blanched.
- Blanched carrots, amla and spinach were grinded using home scale grinder to form puree.

2.2 Preparation of Flours

- All the nuts were procured from local market and weighed at equal amounts
- They were then roasted slightly and finely ground to make flour
- The prepared flour was used for further process

2.3 Preparation of dough

Dough sample was prepared from soft flour of chickpea, almond, flaxseed, pumkinseed obtained by adding the requisite of puree prepared and fat, salt, chilli powder and ajwain at the rate of 3g, 3g, 0.5g, 0.5g respectively to 100g of flour and fried by extrusion through a hand operated extruder in to 300 ml of hydrogenated oil at $175 \pm 5^{\circ}\text{C}$ for 45-50

seconds with turning after few seconds to ensure even frying.

2.3 Preparation of nutrient rich SEV

The steps used for the preparation of nutrient rich sev were discussed in

Fig.1

Raw materials (Chickpea flour, Horsegram flour, Flaxseed flour, almond flour, Curry leaves, , Salt,)

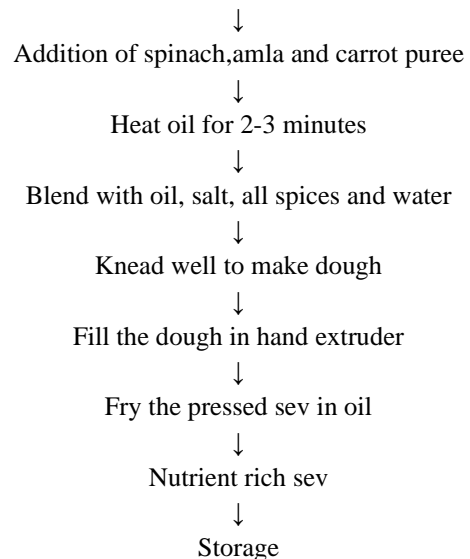


Fig 1: Flow chart for the preparation of nutrient rich Sev



3. ORGANOLEPTIC ACCEPTABILITY OF DEVELOPED VALUE ADDED SNACKS (SEV)

All the developed value added food products were organoleptically evaluated for their colour, texture, appearance, taste and overall acceptability by using 9-point Hedonic scale. On the basis of organoleptic acceptability, acceptable value-added healthy snacks were further evaluated for their proximate composition.

4. PROXIMATE COMPOSITION

The proximate composition of food products were determined by employing the standard methods of

analysis AOAC, (2000). Crude protein was estimated by standard method of (AOAC 2000) using KEL PLUS Automatic Nitrogen Estimation System. The micro Kjeldahl method was employed to determine the total nitrogen and the crude protein (N x 5.95). Crude fat was extracted using petroleum ether using the Automatic SOCS Plus Solvent Extraction System. The ash and crude fibre contents were determined based on methods outlined in AOAC, (2000).

5.RESULT OF PROXIMATE ANALYSIS

Proximate analysis	Results in percentage
Moisture %	2.96 % / 100g
Fat %	23.48 % / 100g
Carbohydrates %	7.86 % / 100g
Protein %	15.33 % / 100g
Fiber %	7.66 % / 100g
Calcium (mg)	190.86mg/ 100g

6.CONCLUSION

In conclusion, this study showed that nutritious snacks can be made using chickpea flour, horsegram flour, flaxseed flour, almond flour, curry leaves, spinach, carrot, and supplements together with bengal gram flour and wheat flour. Up to 18% out of 20% of sensory evaluators preferred sensory acceptance. Consumption of food products containing such supplements can go a long way in improving the nutritional status and health of the population, especially for individuals suffering from Protein Energy Malnutrition. The proximate composition of sev developed from all of these key elements was reported as moisture (2.96%), crude protein (15.33%), crude fat (23.48%), crude fibre (7.66%), and ash (12.877%) content. Total minerals, such as calcium, were measured at 190.86mg/100g. The prepared sev can be used as both a snack and a hair care supplement, since it has a high level of biotin, carotene, and antioxidants.

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