

Enhancing nutritional quality of extruded product by incorporating an indigenous composite powder

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Nutrition and diet are important factors in combating deficiency diseases among children. The incidents of protein energy malnutrition and micro-nutrient deficiencies especially vitamin A and iron are common among under five aged children in India. There is a strong thrust to develop such snacks which not only provide maximum nutrient but also must be liked by this group. Extruded products are most popular in children. In present study an effort has been made to develop a ready to cook extruded product using an indigenous composite powder rich in micronutrients. This composite powder named "Udaipur AICRP Mix" was developed by Foods and Nutrition unit of AICRP on Home Science and is rich in vitamin A and iron. This powder was prepared from dried carrot, spinach, mint, lotus stem, rice flacks, and niger seeds. The reference extruded product was prepared with wheat, bengal gram and maize flour in the ratio of 30, 25 and 45 per cent, respectively. Whereas in experimental products, Udaipur AICRP Mix (UAM) powder was added in different ratio *i.e.* 5, 10, 15 and 20 per cent with the replacement of maize flour. Addition of UAM up to 10 per cent in raw material was found most acceptable at nine point hedonic rating scale. The mean scores for organoleptic characteristics of sweet and savory snack developed with composite flour ranged from 7.8 to 8.7 at nine point hedonic rating scale. The control and experimental product were analyzed for their proximate and iron composition by the standard method. Results revealed that the protein, fat, energy and iron content for reference was 12.25g, 1.45g, 381 kcal and 4.58 mg, respectively. While with addition of UAM 10 per cent, contain protein 15.31g, fat 4.0g, energy 410 kcal and iron 11.68 mg. The extruded product stored for three month for its shelf life evaluation and showed no significant difference in organoleptic quality during the storage of product.

Key Words : Extruded, Cold extrusion, Composite powder, Sweet snack, Savory snack, Micronutrient, Iron rich mix

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INTRODUCTION

Snack foods now comprise an important part of the daily nutrient and calorie intake especially for children. Extrusion cooking is used extensively in the manufacture of ready to cook and eat snacks/ breakfast cereals and has dramatically transformed the cereal industry, the key being quality extruded products offered to consumers at competitive price (Lin *et al.*, 2002). Convenience food usually titled as junk foods, empty energy foods etc. Food industries thus making all the efforts

to enrich their foods with various nutrients to deny this label.

Drying of vegetables and fruits during season and their use in off season is a traditional practice. Most of the vegetables are seasonal, but their demands retained throughout the year. Preservation of fresh vegetables at homestead level is quite expensive and less feasible. Drying is the traditional and most convenient practice to increase the longevity of products. This is a common practice which has been used since ancient India. A micronutrient rich (vitamin A and iron) powder has been developed under All India Coordinated Research Project on Home Science, Foods and Nutrition Udaipur. This indigenous powder mix named "Udaipur AICRP Mix"(UAM) contains - carrot, lotus stem, rice flakes, niger seeds, spinach and mint powder in the ratio of 1:9:3:4:2:1, respectively (AICRP, 2001 and Jain *et al.*, 2010).

In India although mid day meal schemes have been introduced in schools where fortification of food such as iodized salt is served to promote growth and development in children

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