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## Chemical evaluation of health mix foods developed from quality protein maize

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### Abstract

To study the effect of Health Mix Foods on three type of food Mixture prepared viz- Health Mix food-I (Maize -1000gm, Wholemung -100gm, Skimmed milk powder -300 gm, chocolate powder-100 gm, Sugar powder-400 gm), Health Mix food- II(Maize - 1000gm, Bengal gm-100 gm, gingelly seed- 150 gm, Skimmed milk powder -300 gm, chocolate powder-100 gm, Sugar powder-400 gm)and Health Mix Food-III(Maize- 1000gm, Wholemung -100gm, Skimmed milk powder -300 gm, chocolate powder-100 gm, sugar powder-400 gm).The study was conducted on 30 respondent selected randomly of age group 18-45, only female sex group in some rural areas of selected village of palamu district (Jharkhand). Health Mix foods developed for farm women under home scale processing methods and these foods prevents from malnutrition disease. These foods were evaluated for proximate composition. The moisture content in all three health mix foods was below the safe moisture level. Health Mix foods -II contain highest amount of fat (8.4%), Fiber (2.28%) and crude protein (15.82%) Comparatively Health Mix foods II and I. The Health Mix I contain Carbohydrate (83.67%) in complex form. Highest amount of fat (1.9%) contain in Health Mix foods I than other two Health Mix foods.

**Keywords:** Quality Protein Maize, Proximate composition, Health mix foods, Nutrient, Protein

### Introduction

Malnutrition continues to be the major health problem of the developing world included India (Bhraman, 1999) [1]. Our farm women populations suffers from a number of nutrition related problem like – diabetes, Hypertension, Cardiovascular, Kidney failure, anemia and osteoporosis etc. Anemia and Osteoporosis resulting most often, into the practice are common problem of form women population. Many theories have been prepared behind those entire problems. One of the most important is free radical playing on important is free radical which refers to the increased level of free radical playing on important role in the pathogenesis of farm women aging. Malnutrition result from imbalanced between needs of an intake of nutrients. In India, Gender inequality in nutrition in present from infancy. Malnutrition is related to poverty, less income, Lack of awareness and illiteracy (Pant, 2002) [2]. Health mix food contains high protein, calorie, and low fat and high fiber. High calories and protein diet are helpful in increasing of technology to better performance work and as well as these food should be rich in other nutrients especially protein because it is urgently required to present free radical damage to the body along with combating other protein deficiency problem. Keeping all these points in view, it has been planned to develop the health mix food from quality protein maize and to taste them for the acceptability as judged by colour, flavor, texture, taste and general acceptability.

### Materials and methods

**Materials:** Quality protein maize (*Zea mays*), wholemung (*Phaseolus aureus* Roxb), Bengal gram (*Cicer arietinum*), Gingelly seeds (*Sesames indicum*) and Groundnut (*Arachis Hypogaea*) were used for the study. Quality proteins Maize were obtained from the department of plant breeding, Birsa Agriculture University, (Kanke) Ranchi. Other food materials were obtained from the local market of Palamu district of Jharkhand.

**Preparation of materials:** Quality protein maize was processed under different processing methods, viz. soaking, Alkali treatment and roasting. At first, maize grains were soaked for 5 minute in double amount of 1 percent lime water. Heat treatment was given to it for 30 minutes. Then, it was kept overnight. Next morning, the grains were washed for 4 times and kept in the sunlight for drying. After drying the grains were roasted till the desirable flavor was obtained.

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**Green gram & Bengal gram pulses-** Green gram & Bengal gram pulses were soaked in double amount of water for 4 hour. Water was drained off and the pulses were kept in the sun for drying. Then it was roasted on low flame till the 9 desirable flavor developed.

**Gingelly seeds and Groundnut** –Gingelly seeds and Groundnut were cleaned, washed, dried and roasted to improve the digestibility and palatability.

#### Formulation of Health mix Foods

**Health mix Foods -I** The ingredients required were: Maize - 1000 gm, Wholemung-100 gm, Skimmed milk powder- 300 gm, Chocolate powder- 100 gm, Sugarpowder-400 gm.

#### Result and discussion

**Table 1:** proximate composition of health mix foods developed from Quality Protein Maize Proximate composition (%)

Health mix foods	Moisture	Ash	Fat	Crude Fibre	Crude protein	Carbohydrate
Health mix food I	3.07	1.9	2.94	1.46	8.39	83.67
Health mix II	2.90	1.8	8.04	2.28	15.82	71.36
Health mix III	3.41	1.7	5.06	2.02	10.41	78.50

The proximate composition of all the three health mix foods – Health mix food-I, Health mix -II and Health mix -III the moisture content in all three health mix foods varied from 2.90 to 3.41 per cent. It was observed to be the highest in health mix foods – III (3.41) followed by 3.07 percent in health mix foods- I and 2.90 per cent in health mix food –II. The ash content of health mix foods varied from 1.7 to 1.9 per cent. It was found to be the highest (1.9%) in health mix food -I followed by 1.8 per cent in health mix food -II and 1.7 per cent in health mix food -III. The fat content of health mix food developed from QPM varies from 2.94 to 5.06 per cent. Health mix food II was more percentage (8.04) in respect health mix food III (5.06%) and Health mix-I (2.94%).Crude fibre contained and varied from 1.46 to 2.28 per cent, Health mix food-II contented more fibre in compare to other two health mix food groups. Proteins were more important and differ from 8.39 to 15.82 per cent. In three health mix food percentage of protein was more in health mix food-II (15.82)in respect to Health mix food –III (10.41) and Health mix food-I(8.39).In health mix food carbohydrate was found in more per cent of health mix food-I in compare to other health mix foods (II&III). For nutritional quality the food were analyzed for proximate composition (moister, fat, ash, crude fibre, crude protein and total carbohydrate content). The moister content is the main factor which decides the keeping quality of food. The higher moister content is the favorable medium for microbial growth which spoils the food. The health mix foods developed from Quality protein maize were analyzed for proximate composition. The moister content was found to be around 3.07 to 3.41% which is below even the safe moister level i.e. 8-12%. These health mix food cane surely be kept in good condition for long period if stored in tight container after sealing. The ash content health mix food which shows the mineral composition varied from 1.7 to 1.9 per cent. It was found to be the highest (1.9%) in health mix food I followed by 1.8 per cent in health mix food II and 1.7% in health mix food III. The range of crude fiber content is all the three health mix foods develop from Quality protein maize was between 1.46 and 2.02 per cent. The highest crude fiber content was in health mix food- II (2.28) and the lowest

**Health mix Foods - II** The ingredients required were: Maize - 1000 gm, Bengal gram-100 gm, Gingelly seeds-150 gm, Skimmed milk powder- 300 gm, Chocolate powder- 100 gm, Sugarpowder-400 gm.

**Health mix Foods –III** The ingredients required were: Maize -1000 gm, Wholemung-100 gm, Groundnut -100 gm, Chocolate powder- 100 gm, Skimmed milk powder- 300 gm, Sugarpowder-400 gm.

All three health mix foods, were evaluated chemical composition i.e. moisture(%)-Hot air oven method, Ash(g)-use polar and non polar solvent, Crude fibre (g)- N-sulphuric acid and N-sodium hydroxide, Crude protein(g)-Macro-kjeldahl method and carbohydrate content by the standard method of national institute of nutrition (1983).

was in health mix food I (1.46).The presence of crude fiber in health mix food is essential to prevent constipation. Here health mix food I contains very high amount of fiber sowing their suitability of the rural women. The fat content was observed to be 8.04 per cent in health mix food II followed by 5.06 per cent in health mix food III and 2.94 per cent in geriatric mix I. The highest protein content (15.82%) was found in health mix food II. On the contrary, carbohydrate content was the lowest (71.36%) in health mix food II. The percentage of carbohydrate content was 83.67 in health mix food I and 78.50 in health mix food III. Carbohydrate, fats and proteins in the food are the chief source of energy which are required for physical activity. In addition, protein is essential for showing down the aging process and to prevent malnutrition among the rural women population. But the protein should contain balanced amino acid which determines its quality. Here all the health mix food has been developed from quality protein maize with balanced amino acid composition.

The crude protein content was highest in health mix II. But the level of protein in other two foods also per 100 k. cal was more than minimum adequate level. Not only Quantity wise, but quality wise all three health mix foods were better. Generally, in carbohydrate many materials of sugar are combined together and often found in the form of many materials of sugar are combined together and often found in form of oligosaccharide and polysaccharides. The oligosaccharide and polysaccharides, on enzymatic reaction are broken down in to simple sugar. These sugars after converting into glucose are oxides to liberate energy. Hence it is very essential to know the amount of search and glucose present in the food. In case of diabetic patient, complex carbohydrate with lower amount of glucose is recommended so as to release minimum amount of glucose. The calorific value of all three health mix food developed from quality protein maize was between 392.7 k cal to 420.68 k.cal per 100 g. In all the three health mix foods, the contribution of carbohydrate was maximum for calorific value of the food. But the highest calorie contributing from carbohydrate in health mix food I (334.68%) followed by health mix III

(314.0%) and health mix food II (285.04%). The share of fat for calorific contribution was highest in health mix food II (72.36%) followed by Health mix food III (45.54%) and health mix food I (45.54%). But the Share of protein for calorific contribution was the highest (63.28%) in Health mix food II; followed by health mix food III (41.64%) and Health mix food I (33.56%). The availability of nutrient per 100 k.cal was determined to find out whether the nutrients are available in sufficient amount to meet the requirement of the rural women. The level of protein per 100 k.cal in all three health mix foods is above the adequate level of 2.06 g and 0.68 g per 100 k.cal for female and male beneficiary, respectively. The fat content of health mix food I and II did not meet the recommended adequate level. This health mix foods can be given with milk. In case of beneficiaries who are recommended to take low fat diet, the foods should be given with water.

### Conclusion

Nutritional qualities the food were analyzed for proximate composition (moisture, fat, ash, crude fiber, crude protein and total carbohydrate content). Generally, In carbohydrate many molecules of sugar are combined together and often in the form of oligosaccharides and polysaccharides, on enzymatic reaction are broken down into simple sugar. These sugars after converting into glucose oxidized to liberates energy. These health mix foods better for farm women health purpose and generate entrepreneurship.

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