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FORMULATION AND STANDARDIZATION OF PROTEIN RICH HEALTH MIX POWDER

[1]Ms. S. Basheerunnisa, [2] M. Elameswari
[1]Assistant Professor, [2]Student
[1]PG Department of Nutrition and Dietetics,
[1]Jamal Mohamed College, Tiruchirappalli, India

Abstract :

Protein is a macronutrient, and it is essential for building muscle mass. Protein is commonly found in animal products, and plant products as well, such as nuts and legumes. These are large, complex molecules that play many critical roles in the body. They do most of the work in cells and are required for the metabolic functions, structure, and regulation of the body's tissues and organs. Quinoa comes from the Chenopodiaceae family. It has potential health benefits and exceptional nutritional value: a high concentration of protein (all essential amino acids are highly bioavailable), unsaturated fatty acids, a low glycaemic index, minerals, vitamins, and other beneficial compounds. It is also gluten-free. It has a higher protein content and a higher lysine content. Quinoa supplementation is useful for boosting performance in athletes. It is an important source of minerals and vitamins and has also been found to contain compounds like polyphenols, phytosterols, and flavonoids. The quinoa is incorporated with green gram dhal, horse gram dhal, black gram dhal, peanut, soyabean, jaggery, pistachio, almond, and milk powder. This protein-rich health mix with high acceptance in sensory evaluation has the highest protein content of 19.679mg, which helps to improve the protein level. This protein rich health mix contains good sources of energy, protein, fiber, calcium, fat, carbohydrate, iron, vitamins, and minerals. Hence this protein-rich health mix will be beneficial for athletes.

IndexTerms **- Quinoa, Protein, Benefits, Protein rich health mix.**

I. INTRODUCTION

Protein is a macronutrient that is essential to building muscle mass **(Nagamani Manjunath, 2021)**. Protein are development of muscle, help with bone metabolism, maintain ideal weight, prevent heart related diseases, control sugar level, promote the brain function, slow down ageing process, improve immune system, Hormone balance, prevent hair damage, makes skin healthy, eliminate anxiety **(Dt. Ms. Shilpa Marwah, 2023).** Protein also helps repair and strengthen muscle tissues, which is important to build lean muscle and may reduce the risk of injury **(Lilian E and Abugoch James, 2009).** Quinoa has a higher protein content and has a high lysin content **(Jennie Upton,2023).**

Now here we are initiating the development of "Protein rich health mix". Adding equal proportion of quinoa, green gram dal, soya bean, horse gram, peanut, black gram, green gram, jaggery, almond, milk powder. In this health mix nutritional adequacy are good sources of protein, fibre, calcium, fat, carbohydrate, iron, vitamin and minerals.

II. OBJECTIVES

- To select the protein rich ingredients. To formulate and standardize the health mix powder.
- To evaluate the organoleptic properties of the health mix powder incorporated in food products and analyze the antioxidant activity, nutrient composition, phytochemical, protein content for formulated product.
- To study the shelf life of the health mix powder in various packaged materials.

III. REVIEW OF LITERATURE

Quinoa*(Chenopodium quinoa willd)* has a higher protein content than many cereals (Poaceae: the grass family) and has a high lysine content in contrast to cereals which are low in lysine. It is relatively disease-free. Health benefits of Quinoa are, reduce inflammation, it helps control sugar level, lower cholesterol, Gluten-Free and Low-FODMAP (fermentable oligo-, di-, mono-saccharides and polyols)**. (Jennie Upton,2023).** Horsegram has excellent therapeutic properties and traditionally used to cure kidney stones, asthma, bronchitis, leucoderma, urinary discharges, heart diseases, piles etc **(A Bhartiya, JP Aditya, et al ,2015).**

Soyabean proves to be the most popular means of relief from Protein Calorie Malnutrition (PCM) as protein from animals is beyond the cost many people can afford, **(EF Fabiyi, 2006).** Black gram is a nutritious legume and also a good source of protein **(Goswami, K., & Shukla, et al. (2021).** Green gram dhal rich in essential amino acids, antioxidants, and nutrients that may help reduce blood pressure, LDL cholesterol levels, and heart disease risk. **(Ryan Raman 2023)**

IV. MATERIALS AND METHODS

A) Source of Raw materials

Protein rich health mix ingredients were collected from the local areas of trichy district.

B) Development and standardization of Protein rich health mix

Quinoa, green gram dal, black gram dal, horse gram dal, soya bean, almond, pista, peanut, jaggery, milk powder was used for the development of health mix.

C) Flow chart for development of Protein rich health mix powder

Collections of raw materials

⇩

Dry roast each ingredients

⇩

Grind it to a powder

⇩

Sieve to get a perfect smooth powder

⇩

Store the health mix powder in air tight container

Plate 1: Protein rich health mix powder

D) Sensory evaluation of Protein rich health mix

In this study, standardized Protein rich health mix was organolepticlly analysed for its acceptability such as its appearance, colour, flavor, taste, texture by semi-trained panelists comprising 20 members including staffs and students at Jamal Mohamed (autonomous), Tiruchirappalli.

E) Nutrient Analysis of protein rich health mix

The protein rich health mix was subjected to analysis for the nutrients in laboratory. The nutrient content like protein, energy, fat, carbohydrate, calcium, iron and fibre are analysed in Trichy Research Institute of Biotechnology (P) Ltd.

F) Nutritive value calculation of Protein rich health mix

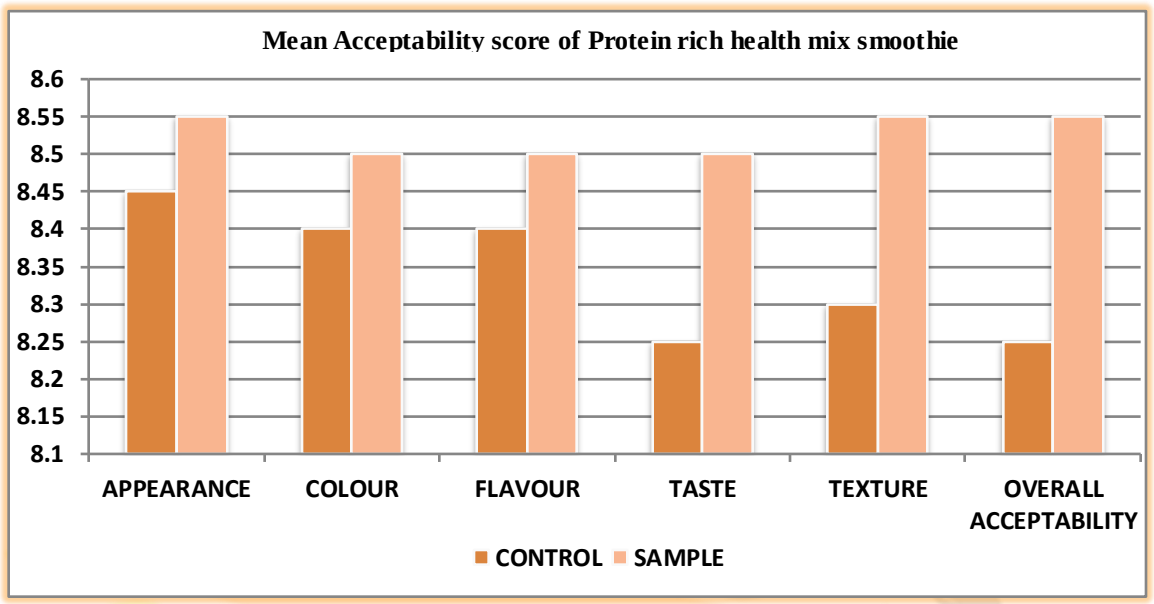
The nutritive value of protein rich health mix such as protein, energy, fat, carbohydrate, calcium, iron and fibre were analysed. The nutritive value of the standardized protein rich health mix was calculated using nutritive value of Indian foods.

V. RESULT AND DISCUSSION

I. Sensory evaluation and mean acceptability score of Protein rich health mix incorporated smoothie

The sample 50g of Protein rich health mix incorporated smoothie were prepared. The figure 1 showed the overall acceptability of protein rich health mx incorporated smoothie.

Figure 1: Mean Acceptability score of Protein rich health mix smoothie



II. Nutrient composition of Protein rich health mix

Table I: Nutrient composition of protein rich health mix

S.NO	NUTRIENT	VALUE/100 g
1.	Energy	71.1 kcal
2.	Protein	20.2g
3.	Fat	22.5g
4.	Carbohydrate	28.3 mg
5.	Calcium	664.4295 mg
6.	Iron	0.7mg
7.	Fibre	23 g

Table II: Nutritive value calculation of protein rich health mix incorporated smoothie

Ingredients	Quantity (g/ml)	Energy (Kcal)	Protein (g)	Fat (g)	CHO (mg)	Calcium (mg)	Iron (mg)	Fibre (g)
Banana	50	53.18	0.75	0.18	11.71	4.37	0.18	1.17
Milk	100	72.9	3.26	4.48	4.94	118	-	-
Jaggery	10	35.37	0.19	0.02	8.49	10.7	0.46	0
Protein rich health mix	10	36.75	1.95	1.10	4.57	21.88	0.61	1.21
Almond	5	30.46	1.04	2.95	0.53	11.5	0.23	0.65
Total		228.66	7.19	8.73	30.24	166.45	1.48	3.03

VI. CONCLUSION

In conclusion, the incorporation of protein rich health mix powder into the smoothie was well accepted by many peoples due to its thickening effect without altering the flavor. The protein content in health mix powder not only contributes to the smoothie texture but also offers potential health benefits, such as, help with prevent heart related diseases, control sugar level, promote the brain function, improve immune system. So this Protein rich health mix will be beneficial for sports person.

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