

Exploring the Nutritional Benefits of Multigrain Health Mix for All Age Groups

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Abstract— This study investigates the nutritional richness and therapeutic potential of a multigrain health mix tailored for infants from 8 months onwards, with applicability across all age groups. The health mix, formulated with red rice, ragi, urad dal, broken wheat, pumpkin seeds, almonds, sago seeds, cashews, oats, Bengal gram, and barnyard millet, encompasses a diverse array of essential nutrients crucial for optimal growth and development. Employing traditional processing techniques, the research assesses experimental mixes' composition and sensory attributes, utilizing a 9-point hedonic scale with 15 untrained panellists. Proximate analysis reveals significant levels of energy, protein, carbohydrates, fats, iron, moisture, total ash, and crude fibre, providing valuable insights into its nutritional profile. The study highlights the versatility of the health mix in meeting the nutritional needs of individuals across different life stages and emphasizes its role as a cornerstone for holistic well-being.

I. INTRODUCTION

Health mix, often referred to as infant cereal or baby porridge, represents a blend of essential nutrients carefully formulated to support the unique requirements of infants. Comprising a variety of grains and legumes, the health mix offers a balanced nutritional profile crucial for the rapid growth and development observed during infancy. At the heart of this health mix lies a carefully curated selection of grains, pulses, and seeds, each brimming with essential vitamins, minerals, and antioxidants crucial for supporting the unique nutritional needs of infants, from the iron-rich red rice to the calcium-packed ragi and the protein-laden black urad dal. As caregivers seek to provide the best possible nutrition for their little ones, the quest for wholesome and nourishing meal alternatives takes precedence. In this pursuit, a multigrain health mix emerges as a beacon of nutritional excellence, offering a symphony of flavors and vital nutrients essential for optimal growth and

development. This research embarks on a voyage to explore the nutritional richness and therapeutic potential of a health mix crafted with red rice, ragi, urad dal, broken wheat, pumpkin seeds, almonds, sago seeds, cashews, oats, Bengal gram, and barnyard millet, tailored specifically for infants from 8 months onwards, yet suitable for consumption by individuals across all age groups.

Moreover, including nutrient-dense seeds and nuts such as pumpkin seeds, almonds, and cashews enriches the health mix with a plethora of micronutrients and healthy fats, contributing to cognitive development and immune function.

Combined with fiber-rich oats, sago seeds, and Bengal gram, this concoction promotes digestive health and lays the foundation for lifelong dietary habits grounded in wholesome nutrition.

While specifically formulated for infants from 8 months onwards, the versatility of this health mix transcends age boundaries, catering to the nutritional needs of individuals across the lifespan. Whether it's providing a nourishing meal for growing toddlers, supporting the energy requirements of active adults, or nourishing the health and vitality of seniors, this multifaceted blend serves as a cornerstone for holistic well-being.

At its core, this health mix transcends age barriers, catering to the nutritional needs of children, adults, and seniors alike. Whether it's fuelling the rapid growth and development of young ones, supporting the active lifestyles of adults, or nurturing the health and vitality of seniors, this versatile concoction serves as a cornerstone for holistic well-being across the lifespan. A fusion of essential nutrients packed into a single meal emerges as the quintessential family porridge.

Crafted with a meticulous blend of cereals, pulses, and nuts, it caters to the discerning taste of today's health-conscious consumers. This amalgamation not only offers a symphony of flavor but also serves as an exemplary source of high-quality proteins and vital vitamins, guarding against a spectrum of nutrient deficiency disorders. Positioned at the forefront of promoting the holistic well-being of families, Health Mix stands as a beacon of nutritional excellence.

In this paper, we delve into the assessment of diverse experimental mixes derived from an array of locally sourced ingredients, employing traditional processing techniques.

II. METHODOLOGY

The concept of health mix was adopted by selecting the staple protein and energy supplement. Three mixes using a blend of cereal, protein, and oilseeds were formulated. Two formulations were created, variant A and variant B.

VARIANT A - Health mix was Formulated from red rice, Finger millet, black urad, broken wheat, tapioca pearl, Bengal gram, pumpkin seeds, cardamom, barnyard millet, foxtail millet, and pearl millet in the mentioned quantities.

VARIANT B - Formulated by reducing finger millet to 25g and increasing the quantity of red rice while maintaining the quantity of every other ingredient. Notably, sago seeds have been eliminated.

Table 4 Ingredients for Health mix

Ingredients	Measurements VARIANT A	Measurements VARIANT B
Red rice	25g	50g
Ragi	50g	25g
White corn	25g	25g
Black urad	25g	25g
Broken wheat	50g	50g
Tapioca pearl	25g	25g
Bengal gram	25g	25g
Tiny kernels	25g	25g
Cardamom	5g	20g

Pumpkin seeds	10g	10g
Wheat	50g	25g
Almonds	10g	25g
Cashews	10g	25g
Barnyard millet	25g	25g
Foxtail millet	25g	25g
Pearl millet	25g	25g
Oats	25g	25g
Sago seeds	50g	nil

Procedure:

All ingredients were thoroughly washed to remove dust and impurities. They were then sun-dried by spreading them in a single layer on a clean surface exposed to direct sunlight. To ensure even drying, the ingredients were turned regularly and protected from contaminants, with care taken to bring them indoors overnight to prevent dew. Almonds, sago seeds, oats, and cashews were roasted separately in a cast iron pan to remove moisture and enhance their nutty flavour. This dry roasting process also helped extend shelf life by reducing moisture content and preventing spoilage. Cardamom was added to provide a pleasant aroma. The cereal grains and other ingredients were procured in a single batch from the local market in Chennai and then finely ground into a powder to create a Health mix. This powder can be prepared by heating it with milk or water for consumption.

SENSORY EVALUATION

The health mix, prepared using various formulations, underwent a sensory evaluation to assess quality attributes including appearance, texture, flavour (taste and aroma), aftertaste, and overall acceptability. This evaluation was conducted by 15 untrained panelists, who used a 9-point Hedonic scale, where 1 indicated the lowest score (dislike extremely) and 9 the highest score (like extremely).

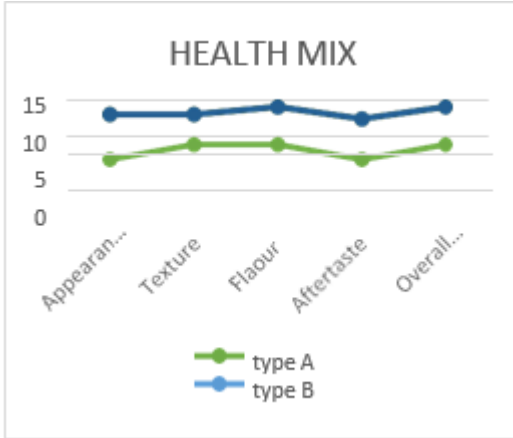
III. PROXIMATE ANALYSIS

AOAC (Association of Official Analytical Chemists) used to determine moisture (8.06), energy (414.3, fat (11.05), carbohydrates (64.4), protein (14.28), iron

(7.4), total ash (2.18) and crude fibre (3.4).

IV. RESULT AND DISCUSSION

Sensory valuation:



Sensory characteristics scores for health mix. Since variant A was more acceptable based on the evaluation, a proximate analysis was carried out for it.

Proximate analysis:

It involves quantifying the content of carbohydrates, fats, proteins, and crude fibre, providing valuable information about its nutritional composition and potential health benefits. This analysis serves as a crucial tool for formulating balanced diets, meeting dietary recommendations, and promoting overall health and well-being.

S. No	PARAMETERS	TEST METHOD	UNIT	RESULT
1	Energy	ALPL/FD/SOP/067	Kcal/100g	414.3
2	Fat	AOAC 21st Edn 2016, 920.85	g/100g	11.05
3	Carbohydrates	ALPL/FD/SOP/065	g/100g	64.4
4	Protein	IS:7219:1973	g/100g	14.28
5	Iron	ALPL/FD/SOP/068	mg/100g	7.4
6	Moisture	FSSAI Lab Manual	g/100g	8.06

7	Total ash	FSSAI Lab Manual	g/100g	2.18
8	Crude fibre	AOAC 21st Edn 2016 Chapter 32 962.09	g/100g	3.4

Proximate analysis for Variant A

CONCLUSION

In conclusion, the formulated multigrain health mix offers a promising solution for meeting the nutritional needs of infants and individuals of all ages. Its well-balanced blend of grains, pulses, seeds, and nuts provides a rich source of essential nutrients necessary for growth, development, and overall well-being. The use of traditional processing methods maintains both nutritional value and sensory appeal. Sensory analysis results show favourable acceptance, highlighting the mix's potential as a nutritious dietary option. With its versatility and nutritional benefits, the health mix represents a model of holistic nutrition, promoting healthier eating habits and improving the quality of life for families. Further research into its long-term benefits and potential applications could enhance nutritional interventions and dietary recommendations.

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