

Development and Nutrient Analysis of Ready-To Prepare Egg White/Milk Powder Based Rice roti Mix

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ABSTRACT

Objective: The present study aimed for assessing development of ready to prepare rice roti lunch mixes based on egg white/milk powder along with other ingredients in different proportions. Also nutrient analysis of best accepted products.

Results: The both egg white/milk powder based rice roti mix was subjected to sensory evaluation, both rice roti mix with high protein in milk powder based rice roti mix content using pulses, egg/milk powder and other ingredients remained constant. Protein content was high in milk powder based rice roti mix (24.58 gm) when compared to egg white powder (10.53 gm). Energy content was 167 Kcal and 372 Kcal egg white and milk powder based mix respectively. Other nutrient content had negligible amount i.e. moisture, ash, iron, zinc and calcium but magnesium (8.9 mg) content is high in egg white powder based rice roti mix compare to milk powder based (6.48 mg). The product was stored for shelf life study for a period of 30 days at ambient temperature. The stored product was subjected for sensory evaluation, which revealed that the mixes can be kept for three months both in ambient and refrigerated temperature without affecting quality. . **Conclusion:** Development of wholesome ready to prepare lunch mixes will help the parents to prepare nutritious healthy lunches without depending on commercially available ready mixes.

Key words: Ready-to-prepare lunch mixes, sensory evaluation, nutrient analysis, shelf life study.

INTRODUCTION

According to international law, a 'child' means every human being below the age of 18 years. This is a universally accepted definition of a child and comes from the United Nations Convention on the Rights of the Child (UNCRC), an international legal instrument accepted and ratified by most countries³.

The present scenario of health and nutritional status of the school-age children in India is very unsatisfactory. The national family health survey (NFHS) data show that 53 per cent of children in rural areas are underweight and this varies across states.

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The percentage of underweight children in the country was 53.4 in 1992; it decreased to 45.8 in 1998 and rose again to 47 in 2006.

A school going children should have about one third of their daily nutrient requirements at lunchtime. This means they need food that is going to provide them with enough energy, protein, vitamins and minerals. It's preferably that, a healthy packed lunch should contain a mix of different food groups and it should be non-messy, easy to eat and less time consuming.

Since the economic reforms in the 1990s women have been streaming into urban workforce, initially as Government office employees and eventually in the booming service sectors and in professional jobs. In the last fifteen years, the number of women in total workforce has doubled due to economic necessity. However, the negative effect of this is an inefficient time allocation of the working mothers towards their children (Das 2014). Busy and fast paced schedules, working mothers find difficulty in packing homemade lunch for their children.

The quantity and quality of packed lunch of high school children plays very important role on nutritional status of these

children. Thus development of ready lunch mixes is important to save time and energy of the mothers as it is easy to prepare and nutritious. Development of wholesome ready to prepare lunch mixes will help the parents to prepare nutritious healthy lunches without depending on commercially available ready mixes.

MATERIALS AND METHODS

Preparation of mixes

Ready to prepare lunch mixes were formulated using different food groups. Two types of rice roti mix was prepared using egg white powder or milk powder along with other ingredients in different proportions. The variation of mixes was showed in the following tables. Vegetables were dried in oven between 40 °C and 60 °C respectively. The formulation was planned for 100 gm, using wheat flour as the base ingredients. The rice flour was replaced with other ingredients at different levels. Total quantity of the mix was 100 gm in all the variations. The ratio of the ingredients was planned as low, medium and high protein using pulses and egg/milk powder at different levels. Other ingredients remained constant.

Table 1: Composition of milk/egg white powder based akki roti mix variations

Akki roti mix with MP/EP	Quantity(gm)		
	AMP-1/ AEP-1	AMP-2/ AEP-2	AMP-3/ AEP-3
Rice flour	76	68	58
Defated soya flour	5	7	10
Green gram flour	9	12	16
Milk/ egg white powder	3	5	7
Shepu	1.5	2.5	3.5
Onion	3	3	3
Carrot	1	1	1
Coriander	0.5	0.5	0.5
Curry leaves	0.5	0.5	0.5
Chilli	0.5	0.5	0.5

AMP- Milk powder based akki roti mix

AEP – Egg white powder based akki roti mix

Preparation of rice roti from rice roti lunch mix

Dough was prepared by adding of 100gm of roti mix and 40ml of water then kneaded to soft dough consistency and rested for 5 min.

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rice roti were rolled and cooked till golden brown with oil.

Sensory evaluation of the product

Developed products were evaluated by 20 semi-trained panel members from the division

of Food Science and Nutrition, GKVK, UAS, Bangalore 560065. The products were evaluated for appearance, texture, color, taste and overall acceptability using 9 point hedonic scale.

Analysis of nutrients of rice roti lunch mix

Best accepted formulated mixes were subjected to macro and micro analysis. Macro nutrients such as moisture, protein, fat and ash were analysed by using standard procedure⁵. Energy and carbohydrate content of the formulated products were calculated. Micronutrients such as iron, calcium zinc and magnesium were also analysed.

Shelf life study of rice roti mixes

The best accepted formulated mixes were studied for shelf life. The mixes were packed in polythene pouches (120 gauges) stored at room temperature. The shelf life study carried out for 30 days and evaluated for prepared products by sensory attributes.

RESULTS AND DISCUSSION

Lunch mixes were developed and evaluated. Two type of rice roti mix was developed using rice flour, dried vegetables and pulse powder

along with egg white/milk powder at different combinations. In case of milk powder based akki roti mix 60 per cent of rice flour and 40 per cent of remaining ingredients showed higher sensory scores. Using 78 per cent of rice flour and 22 per cent of vegetables in egg white powder based mix got highest scores when compared to milk powder based roti mix. This might be because of egg powder which was responsible for the better texture of the roti.

Table 1. Nutrient composition per 100gm of 78 per cent rice flour and 22 per cent of remaining ingredients and 60 per cent of rice flour and 40 per cent of remaining ingredients mix was prepared and nutrient composition is depicted in table. Protein content was same high in milk powder based chapati mix (24.58 gm) when compared to egg white powder (10.53 gm). Energy content was 167 Kcal and 372 Kcal egg white and milk powder based mix respectively. Other nutrient content had negligible amount i.e. moisture, ash, iron, zinc and calcium but magnesium (8.9 mg) content is high in egg white powder based chapati mix compare to milk powder based (6.48 mg).

Table 1: Nutritive value of egg white powder/milk powder based akki rot mix

Nutrients/100gm mix	Products (2 rotis)	
	Egg white powder	Milk powder
Moisture (%)	4.352	5.67
Protein (g)	10.53	24.58
Fat (g)	0.899	1.09
Ash (g)	1.302	2.59
CHO [•] (g)	29.3	66.06
Energy ^{••} (Kcal)	167	372
Iron (mg)	1.079	1.21
Calcium (mg)	65.15	160.2
Zinc (mg)	0.52	0.51
Magnesium (mg)	8.9	6.48

• CHO calculated by difference method.

•• Energy calculated based on CHO, protein and fat content

Shelf life study of the best accepted products was carried out by packing the mixes in polythene covers (HDPP 120 gauge) and stored under ambient condition for 30 days. At ambient condition acceptability of lunch mixes slightly changed in all the sensory attributes when compared to initial stage. The storage

condition did not affect the acceptability of lunch mixes but the acceptability was affected by storage days. These findings are in line with the findings of Mohammed *et al.*⁴ studied on development and evaluation of long shelf-life ambient stable chapathies without the use of chemical preservatives.

CONCLUSION

Due to urbanization and changing life styles and lack of knowledge of parents and children, the Consumption pattern is changed from cereals based homemade foods to more expensive processed foods and market influence of popular fast foods. Lack of nutrition knowledge and unawareness about nutrition are the main reasons for under nutrition in the community. Therefore, there is need for nutrition intervention that aims at educating the school children healthy food habits. Involving the parents in nutrition training programme is more effective in improving the nutritional statue of the children. Thus changes in the dietary pattern due to urbanization in turn influenced the parents in packing their children's lunch box, which affect the nutritional status of the children. Development of wholesome ready to prepare lunch mixes will help the parents to prepare nutritious healthy lunches without depending on commercially available ready mixes.

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