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Processing, Formulation and Market Testing of Nutri Biscuits for Fewer than Threes

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Abstract

Reducing child malnutrition requires nutritious food, breastfeeding, improved hygiene, health services, and (prenatal) care. Poverty and food insecurity seriously constrain accessibility of nutritious diets, including high protein quality, adequate micronutrient content and bioavailability, macro-minerals and essential fatty acids, low anti-nutrient content, and high nutrient density. Largely plant-source-based diets with few animal source and fortified foods do not meet these requirements and need to be improved by processing (dehulling, germinating, fermenting), fortification, and adding animal source foods, e.g. milk, or other specific nutrients. The first 6 months is the most critical period in a child's life. Breast milk is adequate to meet the energy and nutrient requirements of infants. 70% of energy requirements of a child is met by breast milk alone. Calories and other nutrients are needed to supplement the milk until the child is ready to eat only adult foods. At this stage, weaning is initiated. It's observed that calorie protein malnutrition among infant are prevalent in many parts of India and is mainly due to inappropriate and inadequate feeding practice and ignorance of mother. Hence it's necessary to find out viable and useful weaning foods that are suitable for infants. For this, the samples were collected from the rural area. A standard method was followed for the preparation, organoleptic evaluation; sensory analysis, statistical analysis and the ranking test were performed. The results showed that the biscuits had good taste and better nutritive value. The cost of the developed biscuit was 7.50 Rs/- a very less price compared to that of other weaning foods like cereals, farex, which was 30 Rs/- and 40 Rs/- respectively.

Keywords: Rs; Organoleptic evaluation; Sensory evaluation

Introduction

The treatment of malnutrition, as well as its prevention, among fewer than three children require consumption of nutritious food, including exclusive breastfeeding for the first 6 months of life and in combination with complementary foods thereafter till at least 24 months of age, an hygienic environment (clean drinking water, sanitary facilities), access to preventive (immunization, vitamin A supplementation etc) as well as curative health services, and good (prenatal) care. In this paper, the focus is on possible options for providing a nutritious diet, realizing the constraints faced by children below three who lack diet in nutrition.

The first year of life particularly the first 6 months is the most critical period in a child's life. Breast feeding is the prerequisite for child's survival throughout the critical period of life [1]. Breast milk is adequate to meet the energy and nutrient requirements of an infant upto four to six months of age. Thereafter, milk alone is no longer sufficient to meet its nutritional requirements. 70% of energy requirement of a child is met by breast milk alone. Calories and other nutrients are needed to supplement the milk until the child is ready to eat only adult foods [2]. At this stage, weaning is initiated. It's observed that calorie protein malnutrition among infant are prevalent in many parts of India and is mainly due to inappropriate and inadequate feeding practice and ignorance of mother [3].

Hence, introduction of weaning foods along with breast feeding is necessary to infants from the age of 4-6 months onwards. Supplementation of adequate nutrients and calories to young babies prevents malnutrition. There are a number of commercial weaning formulas, which are being used by mothers now-a-days overlooking the high nutritive value of locally available millets and cereals. Hence this present study is taken up by the researcher to see the feasibility of "Development of weaning biscuits for fewer than threes". Hence the researcher performed the work in the following way.

- To formulate and standardize weaning biscuits prepared with easily available foods.
- To test the acceptability in children and mothers.

Methods and Materials

Sample selection

A village named venkata reddy palem in the vicinity of Acharya Nagarjuna University was chosen for this study. For standardization of biscuit, the basic recipe was taken as standard and to this food alteration is done at various levels (Figure 1 and Table 1).

Organoleptic evaluation

Scientific method of sensory food analysis is very important. Attributes like flavor, taste, smell, odor, astringency, bitter etc are evaluated by the following methods like Difference test, Threshold and Dilution sensitivity tests.

Sensory evaluation

For this study, 10 members were chosen and an appropriate time (11am or 3.30pm) is chosen for sensory evaluation. A score card was prepared with color, flavor, texture, taste, and acceptability and was

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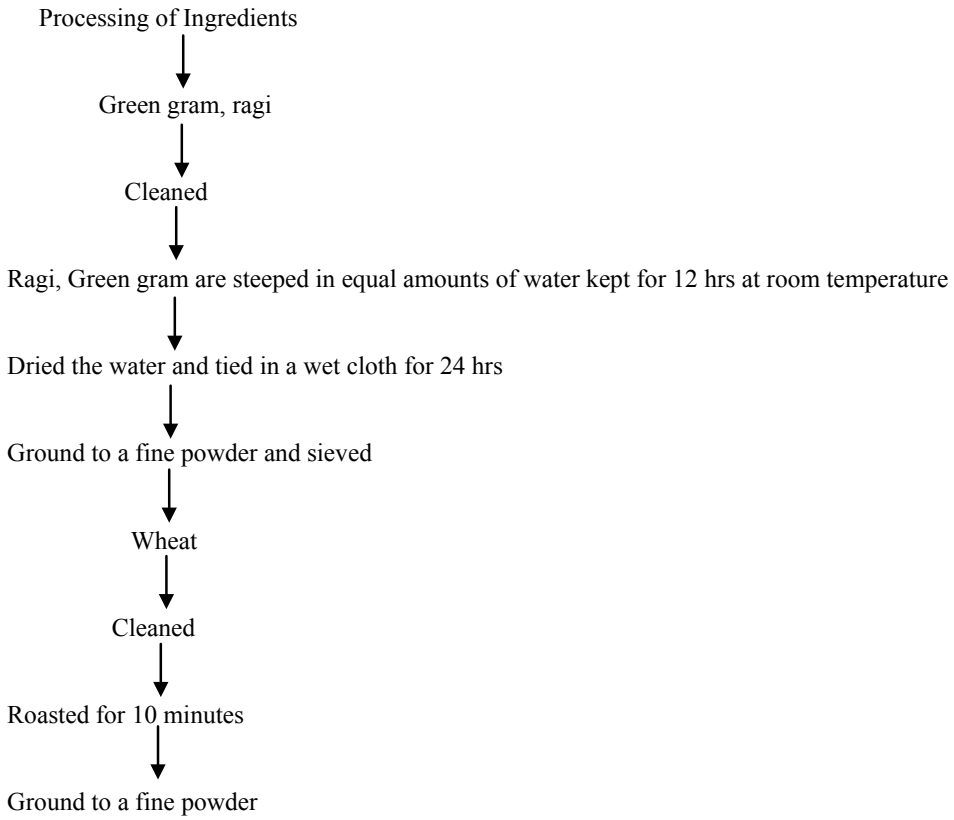

Figure 1: Processing of ingredients.

S. No	Type of recipe	Wheat (g)	Ragi (g)	Green gram (g)	Skim milk powder (g)	Fat (g)	Sugar powder (g)	Baking powder (g)	Essence (vanilla flavor)
1	I-biscuits	80	10	-	10	50	30	3	Few drops
2	II-biscuits	80	-	10	10	50	30	3	Few drops
3	III-biscuits	80	7.5	2.5	10	50	30	3	Few drops
4	IV-biscuits	80	2.5	7.5	10	50	30	3	Few drops

Table 1: The composition of the recipe is given below.

S. no	Weaning foods	Rs. cost /180g
1	Weaning biscuits (developed in the lab)	7.5/-
2	Cerelac	32.8/-
3	Farex	40.5/-
4	Nestum	24.5/-

Table 2: Cost comparison of developed weaning biscuits with commercial products.

presented to the panel members. Later, they were asked to fill with tick marks according to their sensory evaluation.

Results and Discussion

Standardization of weaning foods

Biscuits are made and standardized in the lab. To this, sugar and skim milk powder were added to increase the nutritive value and sugar also played the role of calorie increase. The overall cost of the biscuits worked out to be Rs 7.50/-

Nutritive value

With the changes made in nutrient composition in the different biscuits, there were some changes in the villages in protein content. In venkata reddy palem, a poor village where, a very few mothers (5%) used commercially weaning foods, the cost of developed recipe was compared with commercial weaning foods and it was said to be cheaper than the marked product (Table 2).

Pasricha [4] reported that an Indian young toddler could satisfy his energy needs if feed with a normal Indian pulse and therefore we have an urgent need to device ways of making infant/toddler have diets as rich as possible with time costs, fuel and utensil constraints that operate in a poor home.

Summary and Conclusion

Standardization of weaning foods

- The weaning biscuits were developed with locally available cereals (wheat, ragi, green gram), and skim milk powder is added to improve the protein and calorie values.

- The cost of developed weaning biscuits is very cheap (34 paise/ biscuit of 83g vs 60 paise / biscuit of same weight).
- Of all the 4 varieties, the 2nd recipie is high in protein as it had high green gram amounts.

Acceptability

- All the 4 varieties of the biscuits are well accepted by the experts in lab, and by children and mothers in the field trial.

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