International Journal of Science and Healthcare Research
Vol.7; Issue: 3; July-Sept. 2022
Website: ijshr.com
Short Communication *ISSN: 2455-7587*

A Review: ICDS Programmes: To Develop a New Fortified Nutrient Rich Sugar Free Supplementary Food Product

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DOI: https://doi.org/10.52403/ijshr.20220709

ABSTRACT

Integrated Child Development Services (ICDS) is India's flagship programme for infant and young child health, nutrition and development. Supplementary Nutrition Programme (SNP) is one of the core components of ICDS. *Balshakti* (Energy Dense Micronutrient Fortified Extruded Blended Food) is provided as Take-Home Ration (THR) to children 7 months to 3 years. The feasibility of using a wheat flour mill to refine corn, soya, ragi, moong dal and chickpea was studied. Milling of wheat, ragi, rice, corn, chana dal, moong Dal, and soya grain resulted in fiber content from 1.93, 2.16,2.60 and 2.50 % in raw, finely milled and coarsely milled moong dal and ragi respectively. kcal obtain from BSR and BSM 455.66 & 435.22. Similarly, there was a fat, protein (1.74 &0.70) (25.79 &8.59) content from roasted material, according to ICDS Indian RAD for 12-23 month age group of infant have to required 1060 kcal and 16.7 g protein. our product (THR) provides 500 kcal and 12-15 g protein. aim was this new development to more nutrition and healthy food gave infant. 50% requirement fulfilled by this new product.

Key words: ragi, moong dal, ICDS, THR, protein, nutrition, BS

INTRODUCTION

India's Integrated Child Development Service's (ICDS) Supplementary Nutrition Programme (SNP) guidelines are based, in part, on the Indian Council of Medical Research's (ICMR) Recommended Dietary Allowance (RDA).[1] However, ICMR guidelines are not fully aligned with the World Health Organization (WHO) guidelines and require updating.[2] Additionally, there is significant variation in Take-Home Rations (THR) produced both across and within states, including multiple recipes and formulations that have variable adherence even to the current guidelines. An important factor to consider is that supplementary foods are frequently shared among family members, lowering the amount that beneficiaries themselves consume. Most supplementary foods are not energy-dense, and actual intake is frequently less than recommended, particularly for children under 12 months of age who have a smaller stomach capacity.[3]

Balshakti has been specially prepared to improve the nutritional status of children in the age-group of 6 months to 3 years normal and severely underweight children and 3-6 years severely underweight children. Daily 125 grams of Balshakti to normal weight and 185 grams to severely underweight children of age 6 months to 3 years' children are given per beneficiary.[8] 7 packets of 500 gm each of Balshakti meeting the 500 Kcal energy and 12-15 gram of protein is given to normal weight children and 10 packets meeting the 800 K. cal energy and 20-25 grams proteins are

given to severely underweight children of age 6 months to 3 years. As a Take-Home Ration, severely underweight children between the ages of 3 to 6 are given four of these packets (THR), every month.[10]

Age	Indian RDA for energy/proteins	Per person per day ICDS energy and protein norms for THR	Energy requirement from complementary foods for breastfed infants	Energy requirement from complementary foods for non breastfed infants
6 – 8 months	672 kcal/1.69 g per kg	500 kcal/12 – 15 g	200 kcal/day	625 kcal/day
9 – 11 months	672 kcal/ 1.69 g per kg	500 kcal/ 12- 15 g	300 kcal/day	686 kcal/day
12 – 23 months	1060 kcal/ 16.7 g	500 kcal/ 12- 15 g	550 kcal/day	894 kcal/day

Table: Comparison of Rd Allowances Complementary Feeding Norms &Checkpea Was Studied.

Selection And Identification

Ragi is a food grain used in parts of India, is considered a second-class cereal food. However, it is usually Affordable and is said to be generally accepted by the working classes. Studies show the whole grain to be high in calcium: 400 mg. per 100 g., but low in protein: 7 to 8 per cent. Ragi also contains considerable fiber. Some workers have reported over 9 per cent, mainly cellulose and hemicellulose.[22] Ragi flour contains approximately 3 per cent crude fiber, 7 per cent protein, and about 400 mg. calcium per 100 gm. Ragi is high in calcium which may be insufficient in the total diet.

Ragi is considered as Super food for under developed immunity system of Children and provides various nutrients. It contains high levels of fiber, minerals and vitamins and has eight times more calcium than other cereals. Ragi also contains important amino acids, isoleucine, leucine, methionine and phenylalanine which are deficient in other starchy meals. Ragi is gluten free flour.[23] Making this product sugar free by using a natural plant-based sweetener Stevia with bulking agent erythritol which makes the product suitable for diabetic and calorie conscious humanity

The Moong Bean came under the category of pulse and is related to the family of Fabaceae. It is round in shape and small in size and prepared in the same manner as other bean. It can be eaten up whole or as a split seeds and is widely absorbed in Southern Europe and in Asian countries.[24] Moong Bean contains high protein content compared to chick and has minimum anti-nutritional factors. There are different types of sweets, savoury and snacks products where moong dal is being used. Different Moong bean-based products consumption rate is very high.[24]

Analysis

Fat content of BS was determined using Mojonnier method as described in BIS Handbook [20]. Titratable acidity of the sample was measured according to the procedure mentioned in BIS Handbook [20]. The total nitrogen was determined using semimicro Kjeldahl method. Ash and Total solids (TS) content were determined by procedure described in BIS handbook, analysed by using the standard policy of AOAC. [19]

Microbial Analysis

Yeast and mould count, coliform count and total count was determined (as per manual of Dairy Bacteriology ICAR 1972)

Statistical Analysis

The data obtained during different phases of this study was analysed using completely randomized analysed using Analysis of Variance (one way ANOVA) and Critical difference (C.D) in excel software. [3]

SENSORY EVALUATION

The product was submitted to the sensory evaluation by semi-expert panel of 10 jury using a 9-point hedonic scale scorecard. The selection criterion was that the subject had to be familiar with the product as well as show similar kind of behaviour between sensory evaluation sessions. BS (100 gm) were served. The samples were tempered to 23±2°C. The sample were labelled with random 3-digit codes. The order of presentation of samples was randomized across judges.

RESULT AND DISCUSSION

In this part of the study three source of BS were screened for their suitability. In addition to the above sources, one BS sample was prepared in the laboratory. The method use for preparation of BS is described in method. The samples of product obtained from the three sources termed as BS1, BSR and BSM were mixed. All the samples of BS were analyzed for their proximate composition: fat, protein, nitrogen, ash and moisture content. Etc.
The average composition of BS is presented according, analysis.

SR. NO	NAME OF MATERIAL	MOISTURE%	PROTEIN%	FAT %	FIBER%	ASH %	AIA %	CARBS%	kcal
1	BS	3.134	11.05	10.5	0.13	1.63	0.18	-	518.2
2	BSR	6.736	15.23	15.8	0.09	2.13	0.83	63.14	455.66
3	BSM	7.237	16.39	14.2	0.11	1.69	0.09	60.46	435.22

Table: Critaria Chosen for Process Optimization of BS Manufactiure

Sr. no	Product	Coliform	Spc 10^{-3}	y/m
1	GROUP A (BS 1)	Nil	5	0 to 0
2	GROUP B (BSR)	Nil	125	0 to 0
3	GROUP C (BSM)	10	9	0 to 0
4	GROUP D (BSC)	Nil	5	0 to 0

ENERGY OF BS:

The FAQR (Webb et al., 2011) recommended energy-dense foods with good protein content and an appropriate inclusion of essential micronutrients as necessary (albeit not always sufficient) to achieve defined nutrition goals among vulnerable populations. They, thus proposed changes in the current nutritional and energy profile of BS so that 100 gm of it could provide 455.66, 435.22 kilocalories as energy, 15.23 ,16. 39 g protein and 15.8, 14.2 g fat. They further suggested inclusion of other cereal blends, in addition to it, the availability of staple foods must be ensured so that nutritionally enhanced foods add to it rather than replacing them as sources of energy and nutrition in the local food supply.

ANALYSIS AFTER DAYS	VARIABLES	P-VALUE	STATUS OF NULL HYPOTHESIS	FINDINGS
SAME Days	Colour & Appearance	0.03	Rejected	There is difference in Colour & Appearance of BS at various ing. of BS in over Control
	Flavor	0.01	Accepted	There is difference in flavour of BS at various ing. of BS in over Control
	Body & Texture	0.08	Rejected	There is difference in body & texture of BS at various ing. of BS in over Control
	Overall Acceptability	1.10	Rejected	There is difference in overall acceptability of BS at various ing. of overall acceptability BS in over Control
After 7 Days	Colour & Appearance	0.05	Accepted	There is difference in Colour & Appearance of BS at various ing. of BS in over Control
	Flavor	0.01	Accepted	There is difference in flavour of BS at various ing. of BS in over Control
	Body & Texture	0.01	Accepted	There is difference in body & texture of BS at various ing. of BS in over Control
	Overall Acceptability	0.06	Accepted	There is difference in overall acceptability of BS at various ing. of overall acceptability BS in over Control
After 25 Days	Colour & Appearance	0.49	Rejected	There is difference in Colour & Appearance of BS at various ing. of BS in over Control
	Flavor	0.09	Rejected	There is difference in flavour of BS at various ing. of BS in over Control
	Body & Texture	0.54	Rejected	There is difference in body & texture of BS at various ing. of BS in over Control
	Overall Acceptability	0.29	Rejected	There is difference in overall acceptability of BS at various ing. of overall acceptability BS in over Control

SUMMARY AND CONCLUSIONS

The first volume of the Evaluation Study on Integrated Child Development Schemes by the Programmed Evaluation Organization reports on complaints about quality and quantity of food provided under SNP. The SNP is supposed to provide hot cooked meals and micro- nutrient-fortified and energy-dense food called Take- Home Ration (THR) across the country. Specifically, the program stipulates that THR should meet 50% of the daily

Recommended Dietary Allowance (RDA) per beneficiary Anganwadi workers, anganwadi assistants, supervisors, child development project officers (CDPOs), and district programme officers make up the ICDS team (DPOs). According to the Indian RAD for the 12- to 23-month age group of infants, 1060 kcal and 16.7 g protein are necessary for Anganwadi Workers, a woman chosen from the neighbourhood who serves as the program's frontline honorary worker. There are 500 calories and 12–15 g of protein in our product (THR). aim was this new development to more nutrition and healthy food gave infant.50 % requirement fulfilled by this new product.

Thus It Can Be Concluded On The Basis Of This Study Of BS i.e. moong and ragi Using The Standardized Products Were Found To Contain Higher Levels Of protein, fat, Vitamins Compared To Control. It Is a Good for children (With Considerable Amount Of protein, fat and energy, (466 ,435 Respectively). The Good Texture and Flavour Of product Is Depends Open The roasting and moisture. To Complete the Final Product, It Is Necessary To Maintain The Process, And Storage Temperature. Up to 60days the product quality was good, that's why the final product was ok or not ok for human consumption Based On Sensory Evaluation Score Studies and physicochemical analysis, The Developed Products Have Good Potential For Marketing

component	Value obtained from 125g /day	Recommended daily requirement (1-3 years)	% requirement fulfilled by BS
Energy (kcal)	550	1060	51.89
Fat (g)	13	27	52
Protein (g)	13	16.7	77.84
Vitamin A (mcg)	200	400	50
Thiamine (mg)	0.35	0.50	70
Riboflavin(mg)	0.4	0.60	66.66
Niacin (mcg) Vitamin C (mg)	5.5 20	8 40	68.75 50
Folic acid (mg)	50	80	62.5
Iron	6.5	9	72.22
calcium	300	600	50 %

Acknowledgement: None
Conflict of Interest: None
Source of Funding: None

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How to cite this article: Binal Pandya, Neha Tarpara. A review: ICDS programmes: to develop a new fortified nutrient rich sugar free supplementary food product. *International Journal of Science & Healthcare Research.* 2022; 7(3): 49-55.
DOI: *https://doi.org/10.52403/ijshr.20220709*

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