

ACCEPTABILITY TRIALS WITH READY TO EAT FOODS IN A RURAL AREA

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ABSTRACT

Acceptability trials with three types of recipes was carried out on 184 young preschoolers (6 months to 35 months) residing in four nearby villages around Hyderabad. Results of this study indicated that among the 3 types of supplementary foods (Sweet Ready Mix, Sweet Ready Mix with Amylase and Therapeutic food tested here, the Therapeutic food was more acceptable (taste, smell and bulk) to the children. The criteria for acceptability of the food was defined as the ability of 75% of the children to consume 75% or more of the food supplement at one sitting for 70% of the days of the trial. The Therapeutic food, a calorie dense supplement, met the above criteria. The acceptability was poor for the Sweet Ready Mix and Sweet Ready Mix with Amylase (<4%) mainly due to quantity rather than taste and smell as revealed by the mothers. The mothers of the children also liked the taste and smell of the therapeutic food better. Consumption of the therapeutic food caused minimal side effects like diarrhea and vomiting when compared to side effects after eating Sweet Ready Mix and Sweet Ready Mix with Amylase in children.

Key words: Acceptability, Supplementation, Nutritional Status, Side Effects.

Many supplementary feeding programmes for preschool and school age children are now in operation in several parts of the country. The diets of preschool children in our country on an average show a deficit of about 300 calories and 3-4 g (marginal) of protein(1). Food supplements are based on either locally available foods or on imported food stuffs, such as CSM, Bulgar wheat, etc. Some new preparations like Sweet Ready Mix (SRM), Sweet Ready Mix with Amylase (SRMA) and Therapeutic Food (TF) are being manufactured by A.P. Foods, Hyderabad for use in Supplementary Feeding Programme. It was, therefore, considered necessary to conduct a field trial to assess acceptability of these new food preparations in the community. Accordingly, a study was undertaken with the following objectives to assess: (i) the acceptability of each of the different recipes by children of different age groups and nutritional grades; (ii) the quantity of each of the recipe that can be consumed by children at one sitting; and (iii) the attitude of the parents/guardians towards the supplement (i.e., taste, smell and quantity).

Material and Methods

The study was carried out in four villages (Korremal, Pratapa Singaram, Katchavani Singaram, Parvatapur) situated 15-20 km away from Hyderabad city, during October 1990 to April 1991. A total of 184 children between the ages of 6 months

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to 35 months were enrolled, weighed(2) (on TANSI beam balance) and graded in terms of weight-for-age deficit according to the classification suggested by the Indian Academy of Pediatrics(3).

Each one of the three recipes, was fed to children as 'Laddus' (sweet ball) for ten consecutive days and consumption pattern was closely observed.

Criteria for Acceptability

The food preparation was considered acceptable only when 75% of the children consumed at least three-fourths of the preparation served for 70% of the days attended. The children were closely observed while consuming the supplement "on the spot" for a reasonable length of time by the investigator. The leftover food, if any, was weighed and recorded in case of each beneficiary. The child was allowed to take the leftover food home. The reaction of the mothers to the supplement in terms of taste, smell and bulk (quantity) were also elicited. Information on morbidity of children was collected everyday from the parents for the period of feeding of each recipe.

Seventy seven grams of Sweet Ready Mix and Sweet Ready Mix with Amylase each provided 300 calories and 8-10g of protein. Cooked preparation of Sweet Ready Mix weighed 130 g while Sweet Ready Mix with Amylase weighed 124 g. However, 64 g of therapeutic food provided the required calories and proteins, and when cooked weighed only 70 g (*Table I*). Thus, two sweet balls of 65 g of either Sweet Ready Mix or Sweet Ready Mix with Amylase or one ball of 70 g of therapeutic food was distributed to the children every day for ten consecutive days during the study period.

Results

Out of the 184 children enrolled for the study, 32 were below one year, 72 were between 1 and 2 years and the rest of 80 children were between 2 and 3 years of age. Analysis of their nutritional status showed that 68.5% of them were in normal or Grade I, 17.9% were in Grade II and 13.6% were in Grade III and IV according to IAP classification using NCHS standards.

The average daily consumption of Sweet Ready Mix, Sweet Ready Mix with Amylase and Therapeutic foods was 51.6 g, 53.2 g and 69 g, respectively by the children. The therapeutic food was more acceptable compared to Sweet Ready Mix and Sweet Ready Mix with Amylase irrespective of age (*Table II*) and nutritional grades and was statistically significant ($p < 0.001$) except in the age groups of 6-11 years (*Table III*). It was also observed that there was little difference between the intake of Sweet Ready Mix and Sweet Ready Mix with Amylase except in the case of children in nutritional grades III and IV. More than 90.0% of the required quantity of the therapeutic food was consumed by the children irrespective of their age and nutritional grade (*Tables IV & V*), whereas it was less in case of either Sweet Ready Mix with Amylase (66.1-72.6%) or Sweet Ready Mix (60.5-68.3%).

It was observed that 91% of the children confirmed to the acceptability criteria in case of therapeutic food when compared to a very low acceptability of Sweet Ready Mix (2.2%) and Sweet Ready Mix with Amylase (3.6%). The difference in acceptability was highly significant. A closer look at the data showed that except in 6-11 months age group (66%), almost all the children were meeting the criteria of acceptability for therapeutic food recipe

TABLE I—The Composition of Different Foods

Ingredients	Type of food		
	Sweet ready mix (SRM)	Sweet ready mix with amylase (SRMA)	Therapeutic foods (TF)
Wheat (g)	60	60	45
Full fat soya (g)	15	15	15
Vanaspathi (g)	—	—	15
Sugar (g)	25	25	25
Vitamin premix (g)	0.04	0.04	0.04
Calcium carbonate	0.33	0.33	0.33
Amylase	—	+	—
<i>Nutrients per 100 g</i>			
Protein (g)	13.0	13.0	12.6
Fat (g)	4.3	4.3	18.8
Carbohydrate (g)	74.3	74.3	62.0
Energy (Kcal)	390.0	390.0	470.0
Moisture (g)	4.0	4.0	4.0
Mineral matter (g)	2.5	2.5	1.4
Fibre (g)	1.9	1.9	1.2
Vitamin A (IU)	1250.0	1250.0	1250.0
Thiamine (mg)	0.44	0.44	0.44
Riboflavin (mg)	0.76	0.76	0.76
Iron (mg)	7.35	7.35	7.55
Calcium (mg)	200.0	200.0	200.0

+ indicate present.

— indicate absent.

irrespective of age and nutritional grade.

Discussion

Any food product must be acceptable to the parents of beneficiary children, no matter how nutritious it is, to be used successfully for community feeding. The need for considering mother and child as one unit has been stressed for the purposes of acceptability trials(4). Tastes are learnt and

not inherent or inherited. The mother or guardian's preferences play a dominant and determining role in the choice of food for the young child(5,6). The taste and smell of therapeutic food was liked by a majority of the mothers (83 and 77.3% respectively) followed by Sweet Ready Mix with Amylase (29.9% each) and Sweet Ready Mix (24.7 and 20.6%). Majority of mothers (91%) felt that the children can

TABLE II—Average Consumption of Supplementary Food (Uncooked Weight in g) by Age and Type of Food

Age (mo)	Type food		
	Sweet ready mix (SRM)	Sweet ready mix with Amylase (SRMA)	Therapeutic foods (TF)
6-11	49.5 ± 9.60 (18)	50.9 ± 16.71 (29)	58.6 ± 18.37 (29)
12-23	51.1 ± 8.14 (54)	51.0 ± 8.01 (63)	70.2 ± 11.15 (67)
24-35	52.6 ± 8.50 (65)	55.9 ± 12.26 (76)	71.8 ± 9.25 (77)
Pooled	51.6 ± 8.70 (137)	53.2 ± 11.9 (167)	69.0 ± 12.75 (173)

Figures in parentheses indicate the number.
TF vs SRM; TF vs SRMA. $p < 0.001$.

TABLE III—Average Consumption of Supplementary Food (Uncooked Weight in g) by Nutritional Grade and Type of Food

Nutritional grades	Type of food		
	Sweet ready mix (SRM)	Sweet ready mix with Amylase (SRMA)	Therapeutic foods (TF)
Normal and Grade I	51.9 ± 8.81 (106)	53.8 ± 13.08 (114)	68.3 ± 12.72 (118)
Grade II	51.4 ± 8.01 (25)	51.3 ± 8.22 (32)	72.1 ± 10.34 (32)
Grade III and IV	46.6 ± 8.80 (6)	52.9 ± 10.49 (21)	68.1 ± 15.55 (23)
Pooled	51.6 ± 8.70 (137)	53.2 ± 11.97 (167)	69.0 ± 12.35 (173)

Figures in parentheses indicate the number.
TF vs SRM; TF vs SRMA. $p < 0.001$.

consume the entire quantity of therapeutic food. However, they felt that the quantity of Sweet Ready Mix and Sweet Ready Mix with Amylase was too bulky for young preschoolers. Studies conducted earlier also showed similar results(7).

Analysis of morbidity data showed that only 2.0% of the children each had diarrhea and vomiting after consuming the therapeutic food compared to more

episodes in case of Sweet Ready Mix (15.9 and 5.5%) and Sweet Ready Mix with Amylase (8.8 and 2.7%), respectively.

The study clearly indicated that the children were able to consume on an average, more than suggested quantity per day of therapeutic food (and more than 90% of the children were able to eat more than 75% of the quantity for more than 70% of the days they attended) with minimum side effects. Hence, the therapeutic food which can hereafter be called as 'Calorie Dense Food' should be considered as the best recipe for young children in the nutrition component of ICDS scheme.

TABLE IV—Average Consumption of Supplementary Food (% of Required Quantity) by Age and Type of Food

Age (mo)	Type food		
	Sweet ready mix (SRM) (77g)	Sweet ready mix with Amylase (SRMA) (77g)	Therapeutic foods (TF) (64g)
6-11	64.3	66.1	91.6
12-23	66.4	66.2	109.7
24-35	68.3	72.6	112.2
Pooled	67.0	69.1	107.8

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TABLE V—Average Consumption of Supplementary Food (% of the Required Quantity) by Nutritional Grade and Type of Food

Nutritional grades	Type of food		
	Sweet ready mix (SRM) (77g)	Sweet ready mix with Amylase (SRMA) (77g)	Therapeutic foods (TF) (64g)
Normal and Grade I	67.4	69.9	106.7
Grade II	66.8	66.6	112.7
Grade III and IV	60.5	68.7	106.4
Pooled	67.0	69.1	107.8

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NOTES AND NEWS

ATAXIA-TELANGIECTASIA-CALL FOR CASES

We have established a diagnostic test for this disorder, which can be used for prenatal diagnosis. It is based on the sensitivity of the cells to radiation and other mutogenic agents. We have successfully carried out prenatal diagnosis in two cases. We would be willing to accept cases for diagnosis, including prenatal diagnosis, and would appreciate if you refer the cases to us, at the following address:

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 Professor of Pediatrics and
 Officer-in-Charge,
 Department of Pediatrics,
 Genetic Unit,
 Old Operation Theatre Building,
 AIIMS, New Delhi 110 029.

or

Miss Madhumita Roy Chowdhury,
 Department of Pediatrics,
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