



Foods and Nutrition News

Acharya N.G. Ranga Agricultural University

Vol.III

August, 2005

No. 2

SUPPLEMENTARY FOOD THROUGH PUBLIC DISTRIBUTION SYSTEM (PDS) – SAFEGUARDS CHILD'S HEALTH AND NUTRITION

Foods and Nutrition play a leading role in the life of young children. The child needs adequate amounts of nutritious food to support his rapid growth. The family, as the basic social unit, influences the development of eating behaviour throughout the life cycle. Lack of awareness by the mother and family members regarding the need and importance of supplementary food for the young child seems to be one of the major contributing factors for malnutrition among under five children. The intensity is more so in rural areas due to the compounding factors like illiteracy, poor sanitation and poverty.

Several supplementary foods for children, are available in the market but are not within the reach

of the low income groups. Many low cost supplementary food formulations with locally available foods are being developed by Nutritionists and Dietitians all over the country. However, very few of them had been successfully transferred to the end users.

The public Distribution system (PDS) in India has become nucleus of the Food and Nutrition Policy since 1970 and emerged as the most successful programme in providing essential commodities to the low income groups at subsidized prices.

While it works well with adult food why not for supply of supplementary food for welfare of young children who are the future citizens

While PDS works well with adult food why not for supply of supplementary food for welfare of young children who are the future citizens



"PUSHTI", a wheat-soya based less bulk and nutrient dense supplementary food with good shelf life was developed. The sale of 'PUSHTI' was tested through PDS with the concept of promoting self reliance in rural community and also to create awareness in rural poor of their nutritional requirements.

PREPARATION OF PUSHTI

PUSHTI was prepared in powder form by mixing the popped wheat, roasted deoiled soy flour (edible grade) and sugar in the proportion of 70 : 10: 20 as detailed in Fig. 1.

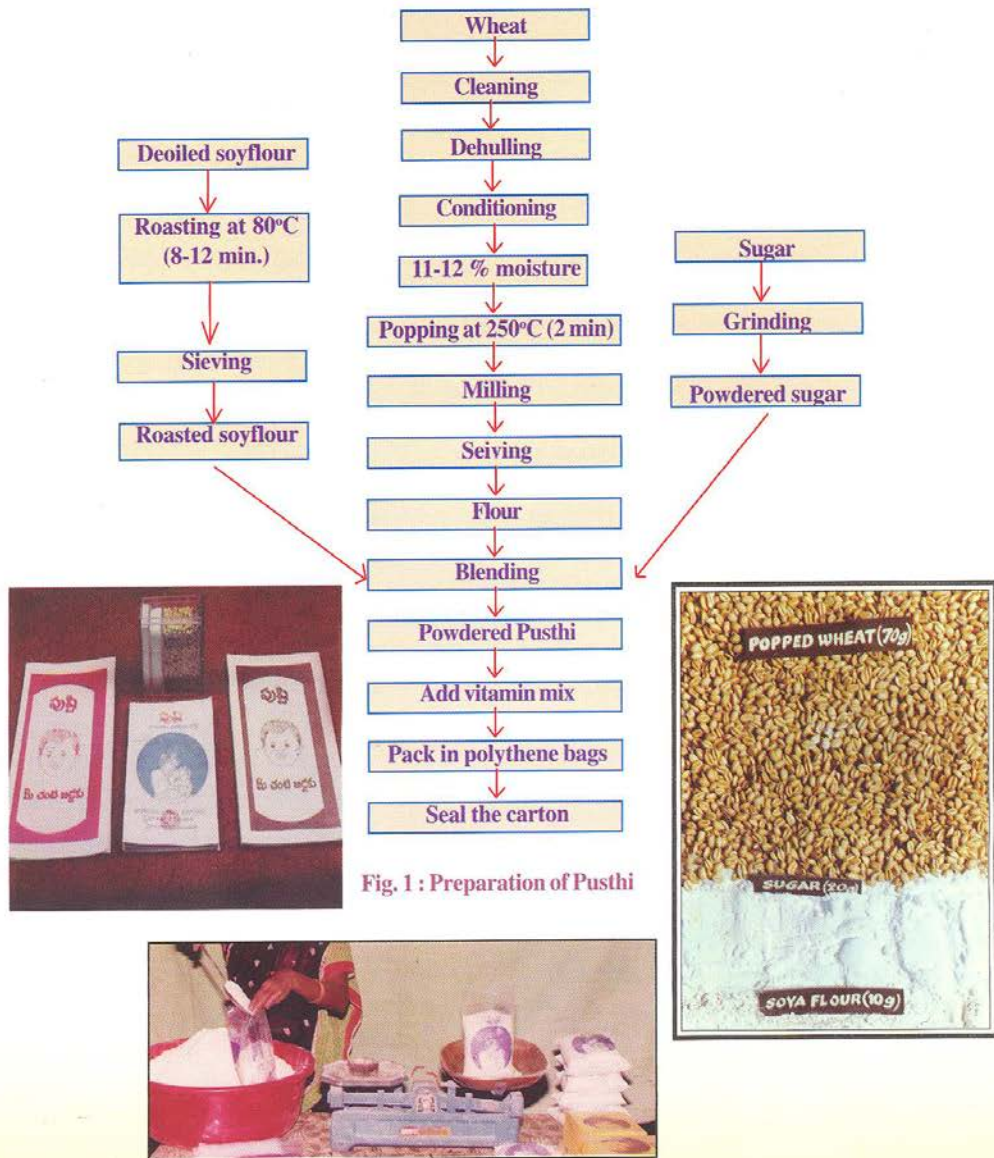


Fig. 1 : Preparation of Pusthi

Pushti had a calorie density of 3.7 Kcal per g on dry weight basis. The viscosity of slurry with 20 % solid concentration was 11×10^2 Cp units and was comparable to the viscosity of commercial mix Cerelac (Fig. 2).

The proximate composition of Pushti is in agreement with ISI specifications as shown in Table 1.

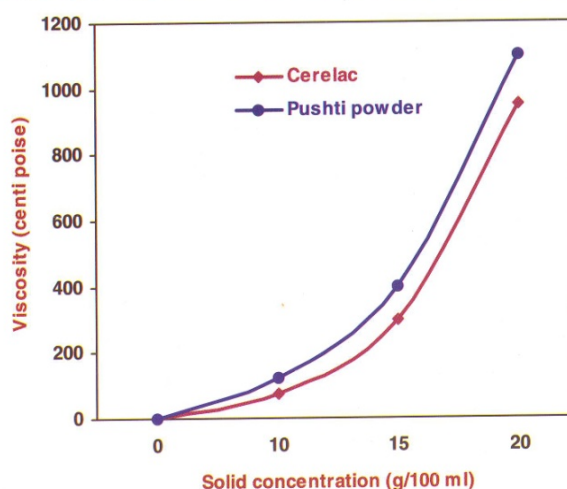


Fig. 2 : Viscosity of Pushti in comparison with commercial weaning food 'cerelac'

Table 1 : Proximate composition of Pushti (g / 100 g)

Nutrients (g)	Pushti	Cerelac	ISI specifications
Moisture	5.08	2.80	10.0**
Protein	12.98	14.40	14.0*
Fat	1.24	9.20	7.5**
Ash	1.53	0.91	5.0**
Fibre	0.88	0.92	1.0**
Carbohydrate	78.29	68.91	45.0*

Figures are mean values of five samples

* minimum level **maximum level

The digestibility coefficient (DC) of Pushti was 80.4 while the net protein utilisation (NPU) was 49.7.

The peroxide value of Pushti at 90th day of storage was 2.79 m.mol / kg fat, well within the ISI / PFA limits, the value recommended is 10 m.mol / kg fat. It was reported that 67 micron Low Density Polyethylene Film (LDPE) providing a shelf life of about seven months is

suitable for its end use of distribution of Pushti through PDS.

Cost of Pushti

Based on the prevailing rates of raw ingredients and labour charges, the cost of PUSHTI works out to Rs. 22/200 g, while the cost of commercial cerelac (200 g) pack is Rs. 86/-.

Pushti a supplement with tenacious therapeutic value

The therapeutic value of Pushti was assessed by determining the effect of different feeding strategies and duration of supplementation required to shift the child's grade of malnutrition to the next higher or normal grade. The study was conducted in 96 pre-school children from urban ICDS centres by dividing them into three groups. Pushti was administered for nine months on two groups through 'on spot' and 'take home' feeding strategies, while the third groups served with ICDS supplement. It was found that the intake of supplement by malnourished children was low in the beginning and improved thereafter. By 12 weeks, the consumption was double the normal quantity of supplement. The delivery of Pushti through on-spot strategy was found to be very effective in shifting all the grade III malnourished children to next higher grade by the end of the study period. The supplementation through take home strategy showed a decrease of grade II malnutrition from 68.8 to 43.8 and grade III malnutrition from 12.5 to 3.1 % resulting in an increase of normal + grade I malnutrition from 18.8 to 53.1 %. The group under 'take home' strategy showed better nutritional response in comparison with the group under ICDS supplementation.

Pushti, a supplementary Food feasible for sale through PDS

The feasibility for sale of Pushti through PDS was studied for nine months in two villages of Ranga Reddy district of Andhra Pradesh. One hundred and fifty three (153) pre school children from low income families were selected as subjects and Pushti was sold at 50 per cent subsidy @ Rs. 2.50 / 500 g packet. The quantity purchased and consumption of Pushti by children in the age group of 25-36 months was considerably more when compared to the other age groups as shown in Fig. 3. All the mothers though valued the supplement very well on the basis of taste, could not purchase adequate quantity even at 50 % subsidy. The income of

the family and the age of introduction of supplementary food showed significant influence on the sale of the

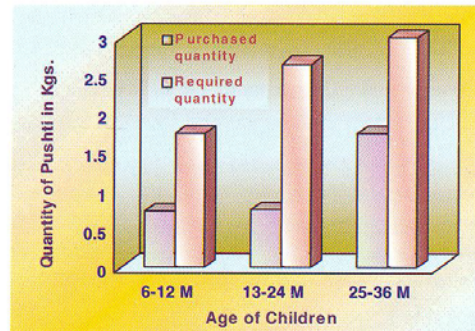


Fig. 3 : Sale particulars of Pushti through PDS

supplement. The literacy level and occupation of mothers have a positive correlation with sale of Pushti.

Impact of sale of Pushti through PDS on nutritional status of preschool children

The impact was assessed through diet survey, anthropometry and morbidity data. Pushti on an average has contributed 103 Kcal / day / child over a period of 9 months. Supplementation with Pushti resulted in a significant decrease in the incidence of grade III malnutrition from 11.3 % to 1.9 % in 6 to 12 months, 8.5 to 4.3 in 13 to 24 months and 7.5 to 1.8 in 25-36 months old children (Fig. 4, 5 & 6). There was a significant increase in normal + grade I malnutrition in all age groups.

The incidence of morbidity was found to be 12-15 episodes / child / year while the corresponding figure in control group was 14-21 episodes / child / year. However, the duration of sickness in both these groups was found to be similar of the order of 6-8 days / child / month.

The results of path analysis indicated the direct contribution of initial body weight and indirect contribution of Upper Respiratory Infection (URI) on the weight-for-age and weight-for-height per cent

standards of subjects. It was also found that the calorie, protein adequacy of the diet and calories from the supplement contributed their maximum effects both directly and indirectly to the weight-for-age and weight-for-height per cent standard of children. Upper Respiratory Infections (URI), diarrhoeal episodes contributed directly, while total episodes of morbidity and initial body weight contributed indirectly to the height-for-age per cent standard of children. Thus supplementation with Pushti has resulted in significant decrease in the incidence of 'Wasting'.

Pushti a sustainable supplement for alleviating malnutrition in pre school children

Pushti, a low bulk supplementary food with its high nutritive, therapeutic value and with good shelf-life is a suitable product for subsidised sale. Besides, it can be prepared at a relatively low cost by utilizing the available wheat and soybean. Thus sale of subsidized supplementary food through PDS is a viable alternative for providing food security to pre-school children of low income groups. Integration of Income generating programmes with supplementary food production at community level facilitates decentralization and contributes for the success of this approach. This can be achieved by establishing proper linkages between the department of Rural Development, Department of Food and Civil supplies besides ensuring the participation of community in

implementation of nutrition intervention programmes. The income generating programme such as DWCRA can be used to setup these units, which can be linked with PDS and ICDS centres for the supply of supplementary foods.

In addition, sincere efforts must be made to impart nutrition education to low income mothers to realize the importance of the usage of supplementary foods to their children.

K. Krishna Kumari and P. Geervani

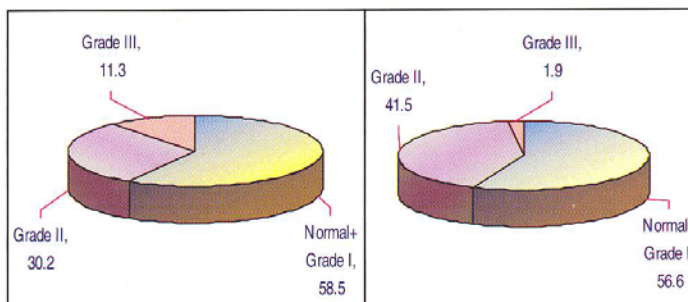


Fig.4 : Nutritional status of children 6-12 months before and after supplementation

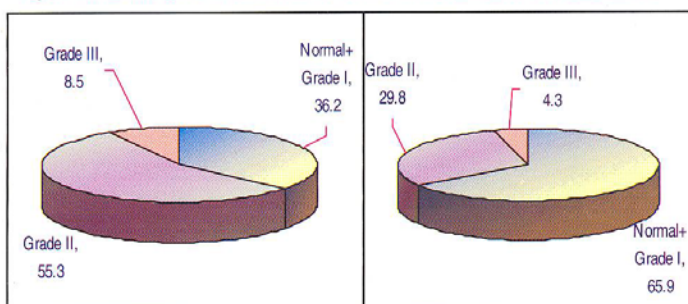


Fig.5 : Nutritional status of children 13-24 months before and after supplementation

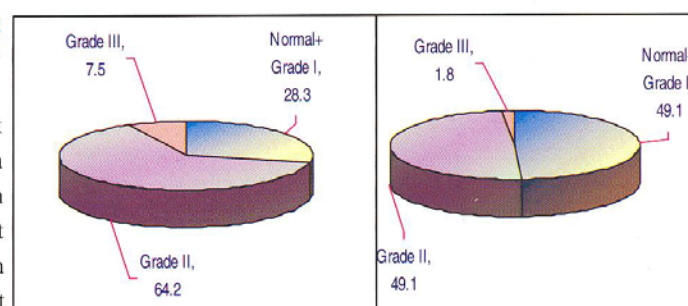


Fig.6 : Nutritional status of children 25-36 months before and after supplementation

EVENTS

National workshop on value addition to foods: Fruits and Vegetables

The second National workshop in the series of the Food Plus 2005 was organized on value addition to fruits and vegetables by AFST (1) Hyderabad chapter on 1st October 2005 at Hotel Taj Residency, Hyderabad. The workshop was organised by ANGRAU and AFST(I), Hyderabad Chapter. The programme was inaugurated by Dr. Y.S. Rajasekhara Reddy, Hon'ble Chief Minister of Andhra Pradesh.

Dr Vijaya Khader, President of AFST I and Dean of Faculty of Home Science, ANGRAU welcomed the dignitaries and the delegates of the workshop. Dr. A.S. Bawa, Director DFRL, Mysore delivered the Key Note Address. The Souvenir was released by Dr. S. Raghuvardhan Reddy, Vice Chancellor, ANGRAU, Hyderabad. The proceedings were conducted in three technical sessions viz., Value addition - Opportunities and Technology Issues, Quality Standards - Regulations and Policies, Packaging and Marketing Strategies.



Release of Home Science Faculty – Profile

The profile of Home Science Faculty of Acharya N.G. Ranga Agricultural University was released on 2nd July 2005 by Dr S.Raghuvardhan Reddy, the Vice Chancellor, ANGRAU at College of Home Science, Hyderabad. The profile comprised of all the academic, research and extension activities including the technologies developed by the faculty. The function was presided over by **Dr. (Mrs) Vijaya Khader**, Dean of Home Science, ANGRAU. **Dr. (Mrs) S. Renuka**, Associate Dean, College of Home Science delivered welcome address. The University Officers and Faculty Members of Home Science participated in this event

Dr. (Mrs) V. Vimala, Professor and Head, Department of Foods and Nutrition, Post Graduate and Research Centre, College of Home Science, Hyderabad, retired on 31st May, 2005 on super annuation.

Dr. P. Rajyalakshmi, Professor, Department of Foods and Nutrition, PG & Research Centre, took over charge as the Head, Department of Foods and Nutrition, PG & Research Centre, College of Home Science and Director of Center of Advanced Studies from 1st June, 2005



Seminars/Workshops attended by the Faculty

Dr. M. Usha Rani, Assoc. Professor and **Dr. K. Uma Maheswari**, Assoc. Professor participated and presented a paper on “**Coping strategies for household food security in dryland areas**” in the workshop on **National Consultation on Food Security for the poor** organized during 27-29th June 2005 by Centre for Agrarian Studies and Disaster Mitigation, National Institute of Rural Development, Rajendranagar.

Dr. Anurag Chaturvedi, Senior Scientist (Nutrition), Post Harvest Technology of Horticultural Crops, ANGRAU on a USAID Scholarship attended a training programme on Food and Agri-Business Management at Coonoor, Tamilnadu (Module I : 16th – 22nd May 2005) and Cornell University, Ithaca, New York (Module 2 : 13th -22nd June 2005).



She had also participated in the National Seminar on ‘**Capacity Building of Agribusiness sector in India**’ held at ANGRAU, 22-24 June, 2005 and presented a paper on “**Radiation Processing in Food Security, Safety and Trade**”.

The College of Agriculture and Life Sciences (CALs) at Cornell University, Ithaca, N.Y., USA in partnership with Hyderabad, India-based Sathguru Management Consultants conducted this program involving leading universities, research institutions, national and state governments and prominent agriculture based companies from India and other countries in Asia. The programme deliverables were information on the concept of the integrated food chain to the public sector, enhancing leadership abilities of the academicians and the private sector, enhancing leadership abilities of changing practices in global agribusiness and helping the NGOs towards integration with stakeholders in the total food chain.

Training Programmes organized for Rural Enterprises

The Department of Foods and Nutrition, Center of Advanced Studies, ANGRAU initiated a project on “Biotechnology for Nutritional Improvement – Popularization of Sorghum Enterprises for Income Generation and Nutrition” funded by A.P. Netherlands Biotechnology Programme with the objective to popularize sorghum and improve the socio-economic status of sorghum farmers in semi-arid areas of Mahabubnagar and Nalgonda districts of Andhra Pradesh. Under this project it is proposed to establish sorghum enterprises in rural areas for which beneficiaries were identified with assistance from NGOs in the operational areas. Two programmes were organized at College of Home Science during 16th – 28th May 2005 to impart training in skill development and capacity building for setting up of sorghum enterprises. These trainings focused on sorghum dehulling technique and utilization of dehulled sorghum in preparation of snack and bakery products and included demonstration and hands on experience in use of dehuller, production of dehulled sorghum semolina and flour and skill development in snack and bakery products preparation. Two batches of 20 women each belonging to Self-Help Groups from Nalgonda and Mahabubnagar districts participated in the training programmes.

Another training programme on preparation of amylase rich malted flours from wheat, sorghum, maize



and soybean was conducted at Sirivaram village, Anathapur district on 10-07-05.

ANNOUNCEMENT

A training programme on Current Scenario and Future Strategies for Nutrition Research will be held by the Centre of Advanced Studies, Department of Foods & Nutrition, Post Graduate & Research Centre from January 18th to February 7th 2006. Free Boarding & Lodging will be provided. The nominations of participants from State Agricultural University Teachers may be sent on or before 31st December, 2005 to :

The Director
Centre of Advanced Studies
Post Graduate & Research Centre
ANGR Agricultural University
Rajendranagar, Hyderabad - 500 030
Ph: 040-24015317 / 23244058 / 23230781
Fax No. 040-24018653
Email : rajyalakshmi peram@yahoo.co.uk

The Food and Nutrition News is published by the Centre of Advanced Studies, Department of Foods and Nutrition, College of Home Science, ANGR Agricultural University. The funds for the centre are granted by the Indian Council of Agricultural Research, New Delhi.

For correspondence Address to
FOODS AND NUTRITION NEWS
Mail to

Editor : **Dr. P. Rajyalakshmi**
Director
Centre of Advanced Studies
Post Graduate & Research Centre
Acharya N.G. Ranga Agricultural University
Rajendranagar, Hyderabad - 500 030

Issue Editor : **Dr. K. Krishna Kumari**
Associate Professor
Administrative Office
ANGRAU, Rajendranagar
Hyderabad - 500 030