



SEED COMMUNICATIONS

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FROM THE DESK OF EDITOR

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WHITHER FOOD PROCESSING INDUSTRY IN INDIA

Food processing industry is struggling hard to come up from the present poor state of affairs. There are two important factors namely, absence of food processing units to reduce the spoilage of fruits and vegetables and the rising energy costs which is affecting the growth of the food processing industry in India.

The study by ASSOCHAM titled "Horticulture sectors in India-state level experience" stated that the combined annual production of fruits and vegetables in India, estimated to be over 227 million tons is likely to cross over 337 million tons by 2021. Out of this 77 million tons are fruits and about 150 million tons are vegetables. Further, the study reveals that the post-harvesting losses of fruits and vegetables are worth over 2 lakh crores each year due to the absence of food processing units. These post harvesting losses are in the order of 13,567 crores in West Bengal and followed by Gujarat (11,000 crores), Bihar (10,700 crores) and Uttarakhand (10,300 crores). After these losses, only 22% reach fresh whole sale market and 5% are processed.

Another survey by Schneider Electric India and Alliance for an Energy efficient economy, revealed that the rising energy costs and irregular power supply have caused Indian industries an annual loss of Rs. 408 billion to the country's gross domestic product (GDP). Rising energy costs is further compounded by the lack of reliable grid supply.

Last one decade, the scenario of food processing industry has not changed appreciably because of the above two reasons. We should remember that the agricultural economy is a fragmented economy in the country with small land holdings by farmers. Besides this, Food Processing Industry is capital intensive and energy intensive. Finally this lands up with

unrealistic approach and policies by Government which is looking only at the prospect of large food processing industry.

SEED implemented an alternative approach of microenterprises in solar food processing with rural farmers and women as stakeholders. This effort is based on innovative high efficient SEED solar cabinet dryers.

SEED has designed and developed a range of solar cabinet dryers starting from 8 kg to 200 kg maximum capacity. SEED is planning 500 kgs solar cabinet dryers which will be introduced soon into the market. R&D division of SEED has already processed 70 new products of fruits and vegetables on commercial scale, using five different drying processes.

SEED has established about 200 solar cabinet dryers with 100 microenterprises in 18 states in the country. This includes export of 4 commercial model solar dryers to Australia, Malaysia, Mauritius and Saudi Arabia.

The technology developed in SEED laboratories is disseminated through training programmes to rural entrepreneurs regularly. These programmes assist the micro-entrepreneurs to maintain a high quality of products.

The Government should help the rural women with this innovative technology by establishing rural enterprises and should offer the financial assistance on liberal terms to self help groups and local NGOs in promoting the solar processed food products.

Prof. M. Ramakrishna Rao
Founder General Secretary

COMBAT MALNUTRITION AMONG CHILDREN

Prof. P.N.Murthy

Introduction

A study conducted on 5516 children ages 0 – 6 years in 12 districts of Andhra Pradesh on the nutritional status of children. The study shows 40% i.e., 2250 were under nourished. Out of the 40% under nourished children, 18% severely underweight and 23% are moderately underweight. The study report reiterates radical changes and better regulation of child development service centers as the need of the hour. The statistics reveal further nutritional deficiency in children in primitive tribes 52% are under nourished and of which 25% are severely underweight, in nomadic tribes 53% are undernourished of which 37% are severely underweight. Among the rural poor 43% are under nourished and among the urban poor 32% are undernourished. Another report in The Hindu on 26th March, 2014 the National Human Rights commission basing on the media report has issued the notices to authorities of severe malnutrition among children in four districts of Haryana 37.4% of children were found to be under weight and 42.8% suffered from stunted growth. The study of Post Graduate Medical Education & Research, Chandigarh said that four districts of Haryana had alarming situation of malnutrition among children. Further Mr. Rakesh Gupta, Mission Director, National Rural Health Mission said that children with severe acute malnutrition were nine times likely to die than well-nourished children. In Haryana 53% of the deaths under age of 5 were due to malnutrition.

The above surveys and statements give the disturbed news about the children regarding malnutrition and under nourished state of affairs. Childhood malnutrition is a massive crisis caused by combination of factors including inadequate or inappropriate food intake, childhood diseases, faulty child care practices, over population poverty, destruction of environment, lack of education, gender inequality, inaccessible medical care and improper care during illness: all contributing to poor health and millions of deaths annually. Vitamin A and Iron deficiency are highly prevalent in all segments of population in India.

Initiative of SEED in Nutritive supplementary drink

SEED has launched a programme, under Bharat Dynamics Ltd sponsorship to formulate nutrition supplement which can provide 20% of RDA of micronutrients to the students for one academic year to Smt. Mallavarapu Seetamma Zilla Parishad High School of Tholkatta. The formulated drink consists of protein, Vitamin-A, Vitamin-C, Iron, Calcium, for children 6 – 16 years using solar

processed natural foods to increase bioavailability of vital nutrients for the target group. A number of natural foods such as malted ragi, defatted soya flour, solar dehydrated tomato, carrot, amla powders, skimmed milk, cashew nut, and sugar in right proportion to get the desired nutrition drink and supplied in the form of 30gm powder per day per student. This could be mixed in the boiling water of 200 ml to make a drink. The following table - I gives the proper composition of protein and micronutrients in the serving size of 30g.

Table – I:

	Protein (g)	Calories (Kcal)	Fat (g)	Carbohydrate (g)	Vitamin A (IU)	Calcium (mg)	Iron (mg)
Composition	12.7	346.8	1.2	74.2	6942.8	227.7	7.1
RDA	50	—	—	—	10000	800	9
% RDA	25%	—	—	—	69%	28%	79%
% RDA/serving 30 gm	8%	—	—	—	21%	9%	24%
Amount serving 30 gm	3.8	104	0.4	22.3	2083	69.3	2.1

Evaluation of Nutritive Drink:

The Nutritive drink was served to 200 students of Smt. Mallavarapu Seetamma Zilla Parishad High School, Tholkatta Village, Rangareddy District, Andhra Pradesh for evaluation of efficacy and acceptance of Nutritive Drink developed by SEED. One serving of Nutritive Drink viz., 200ml consisting of 30g of Nutritive Drink Supplement was served to school children for a period of 6 months with support of BDL under CSR program. The acceptability of Nutritive Drink was rated by school children. 30% of them rated as excellent, 35% rated as very good, 25% rated as good and 10% rated as average.

The efficacy studies were carried out by random selection of children by their physical appearance and the medical tests were carried out initially and after 6 months for their Serum Calcium level, Hemoglobin and BMI. Serum Calcium level has improved by 80% and Hemoglobin by 6%.

Conclusion

The efficacy of the nutritive drink is well established and SEED would like to popularize and promote this nutritive drink for the malnutrition children to meet at least 20% of RDA for health and well-being of the students.

FUTURE ACTIVITIES

- Foundation day celebrations & New Solar Dried Products Launching on 23rd April, 2014 from 5-7 PM at FAPCCI, Red Hills, Hyderabad.
- Two days Workshop on Sensitization of NGOs in Food processing technology on 20th - 21st May, 2014
- Three days Training programme on Solar Food Processing of fruits for Value Addition. Mango, Chikku (Sapota) and Pineapple on 21-23 June, 2014

ACADEMIC PROGRAMMES AT SEED

Internship Programs for University Students

Project Students (2013 - 2014 Batch)

GITAM University, K. L. University, Satavahana University,
Andhra University & Y.S.R. Horticultural University



(Left to Right)

A. VIJAY GOWTHAM, S. HAREESH, D. NARAYANA, M. BHARATHI, A. HANEESHA,
T. Y. SWETHA, P. APARNA, J. RAJITHA, D. NAVYA SRI, L. SUHASINI

Solar Food Processing is a new technology and the universities are not fully equipped with solar equipment and well trained faculty in this new discipline. SEED is only full fledged Laboratory in the country where the students are exposed to the useful and purposeful training in the application of Solar Energy through solar dryer and solar food processing technologies.

SEED has been organising research projects for the students of M.Sc. and B. Tech. for their partial fulfilment of their Degree as a part of Academic program. In this semester total 10 students were enrolled and two students from each university like K. L. University, Vijayawada, GITAM University, Visakhapatnam, Satavahana University, Karimnagar, Andhra University, Visakhapatnam, Acharya N.G. Agriculture University, Hyderabad to complete their project work in SEED Laboratory.

STUDENTS EXPERIENCES

The internee students expressed their views on the training programme are:

"Our project work in SEED has been a very nice experience where we have learnt how to preserve fruits and vegetables by various methods. SEED has good laboratory where we learned to handle various techniques to analyse the physico-chemical parameters by following the experimental procedures. SEED has good library with various text books and international journals. We are pleased and happy to be interns at SEED".

T.Y. Swetha & D. Narayana, M.Sc. Food Science & Technology, GITAM University, Visakhapatnam.

"Our learning experience at SEED has been good. The comparative study on dehydration of carrot powder & Tomato Powder using different techniques such as 1) solar dehydration, 2) osmo-solar dehydration, 3) osmo-shade dehydration, 4) hot air oven dehydration has been good experience. We are learning analysis of physico-chemical parameters microbiological quality, nutrient facts has given us knowledge for our future career".

J. Rajitha & M. Bharati, M.Sc. Food Science & Technology, Satavahana University, Karimnagar.

"As Biotechnology students we are not well versed about Food technology. Undergoing a project here helps us in emolument of knowledge in several aspects of food processing like selection of raw material, processing, packaging. The R&D team here is very helpful in attaining empirical knowledge along with theoretical back up, not only these empirical sessions but also the lectures that are given by the adepts are very useful. The environment here is very adaptable and the whole team of SEED always try to embold people who have zeal in learning. Working here for a period of 6 months is a very good opportunity in our career".

P. Aparna & A. Haneesha, B. Tech. Biotechnology, K. L. University, Vijayawada.

VIP COMMENTS



"A wonderful exposition of low technology of high order is made simple for application in the field level benefiting rural community, my sincere compliments and congratulations for the praiseworthy efforts of dedicated group of professions in serving the Society and Nation".

Dr. D.R. Prasada Raju, Scientist 'G', Adviser & Head (TMC, SEED Division and GLP), Department of Science & Technology

Need and Challenge of Setting up a Rural Food Processing cum Training Centre: Experience of Dangoria Charitable Trust

Dr. Ms Mahtab S. Bamji



Dangoria Charitable Trust (DCT), Hyderabad, established in 1981, runs a hospital for women and children, a Home for the Aged and a tiny award-winning Food Processing cum Training Centre (under Mahila Udyog society) in Village Narsapur, Medak district of Andhra Pradesh, India. Besides the above activities DCT also does extension work in the area of Health, food & nutrition and environment security, in villages of 4 surrounding mandals.

DCT ventured in to food processing on realising the need for a low-cost complementary food for infants and children. In a survey, almost 20% of resource-poor rural mothers fed expensive branded foods, to their infants and children, when they could achieve better results with home-cooked cereal pulse-vegetables/fruits, combinations. However, rural mothers are stressed for time and it was thought that a convenient low-cost, ready-to-cook complementary food would reduce their drudgery, and help child nutrition. A cereal-pulse product fortified with iron, under the brand name Poshana was developed and is marketed through health clinics and hospitals besides other outlets. Users were advised to add vegetables and fruits as source of vitamins and minerals.

Fortification of Vegetables and Fruits

Millet-like ragi, jowar, bajra etc have become orphan grains due to policies which favour fine cereal. Yet they are nutritious being rich in protein, minerals and B-complex vitamins. Ragi (finger millet) is exceptionally rich in calcium. Sprouting (malting) enhances the bioavailability of minerals like iron, calcium and zinc. Malted grains have to be dried and roasted.

Solar Drying Technology

Apart from ragi malt, Mahila Udyog makes a variety of other cereal-millet-legume-based ready to eat/cook nutritious products.

India ranks among the top 2 countries of the world for the production of vegetables and fruits. However, apart from insufficient production to meet the need of its large population, almost 40% is lost post-harvest, with an estimated loss of Rs. 2 lakh crore each year. Small rural food processing units would not only address the problem of post-harvest losses, but also generate employment for women, and contribute to food and nutrition security.

Solar drying is an eco-friendly technology, which can dehydrate vegetables and fruits without needing any energy, enhance shelf life, and preserve micronutrients. Cabinet type solar driers with solar panels to facilitate rapid removal of moisture, (like the ones developed by SEED) though more expensive than cheaper black box type, are ideal. DCT is making extensive use of a solar drier, purchased from SEED to dry malted ragi, a variety of green leafy vegetables (GLV), tomatoes and 'amla' (Indian gooseberry). The solar dried GLV are converted into chutney powders (karap podis) (curry leaf, mint, gongura-hibiscus) which are used as embellishment with rice, idli, dosa etc and can be added to sandwiches and used as condiments. Solar-dried tomatoes are used for making pickle with long shelf life. Solar dried amla is used for making 'supari'. Use of a specially designed blue shield helps to cut off UV radiation and preserves Beta carotene (provitamin A) in GLV.

Major problems

Frequent power failure, non-availability of artisans to maintain machinery, and marketing. To make rural food processing which is so essential for country's economy and nutrition security, these limitations should be addressed. Instead of beaming at large centralised storage and processing facilities, setting up decentralised facilities is a more viable solution for a country like India. Innovations like the cabinet solar drier of SEED which need no maintenance are a boon.

**Dr. Ms Mahtab S. Bamji, INSA Honorary Scientist,
Dangoria Charitable Trust, Hyderabad
Director Grade Scientist, Retd. National Institute of Nutrition,
Hyderabad, India.**