SEED PIONEERS END TO END OPERATION OF FOOD PROCESSING UNITS WITH SOLAR POWER

Prof. M. Ramakrishna Rao

The design and development of solar cabinet dryer has given a good impetus to solar food processing technology. Seven models of solar cabinet dryers were designed and developed depending upon the size, capacity and climatic condtions. SEED developed and standardised 96 solar dried products based on fruits, vegetables and forest produce using the solar cabinet dryers and the data is preserved for these products in the data bank of 'SEED'. This has great potential to significantly reduce of post-harvest losses of fruits and vegetables. 250 dryers of various sizes are installed in the country. This has helped microenterprises to start the processing of fruits and vegetables with zero energy cost and accomplish long preservation and shelf life of the food products. This technology helped in women empowerment and create gainful job opportunities in the rural sector. This endeavor is actively supported by Core Support Scheme of Department of Science & Technology, Government of India with financial assistance and also through various Government projects by different Central Government agences.

During the period, SEED has made great progress and was successful in introducing new innovations in solar food processing technology. Alongside using solar energy based cabinet dryer for dehydration of fruits & vegetables, we successfully integrated Solar energy to operate the downstream and upstream small scale food processing equipment like pulpers, transfer pumps, pulverisers and heat sealing equipment etc., in conjunction with the dehydration process. This successful small processing system interfacing with other smaller capacity food processing equipment was installed as a demo model with 10 KW roof top solar power system. This innovative working prototype is working successfully at SEED R & D Center. These efforts will be continued in future to further scale up the solar power generation system and utilize the solar energy for full scale operation of a small and medium food enterprises.

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SEED

SEED COMMUNICATIONS

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FROM THE DESK OF EDITOR

ADDRESSING SUSTAINABLE HEALTH AND WELLNESS THROUGH SOLAR PROCESSED NUTRITIONAL AND FUNCTIONAL INGREDIENTS

Dr. I. Suresh

Recognition of the relation between diet and health lead to category of food products called health foods or functional foods or nutraceuticals. These Nutritional and functional foods are primarily considered as dietary supplements in the global markets. This is one of the fastest growing food products in the world and expected to grow at 10% (CAGR) in the next five years. Over the past few years, the high adoption rate of fast foods along sedentary lifestyle in emerging economies including China and India has led to the increase in the prevalence of cardiovascular disorders, diabetes, and obesity. As a result, the individuals among high socio-economic and upper-middle-class income groups are expected to perceive the nutraceuticals including dietary supplements as the alternatives to prescribed drugs.

Fruits and vegetables are excellent source of many vitamins, minerals and other natural substances, which play vital role in alleviating micronutrient malnutrition and health issues. India is Second largest producer of fruits and vegetables (F&V) in the world. However, a meager 4-5% of F&V are processed with very high incidence of post-harvest losses.There is an increasing interest in dietary supplements made using natural products like grains, fruits and vegetables. As fruits and vegetables are the excellent source of vitamins and miners with number of health benefits. These plant products also have number of biologically active constituents with hypocholesteremic, antidiabetic and anticancer properties. They can be processed to produce natural dietary supplements with various targeted benefits to different target population.

Use of solar energy in the agricultural area to preserve vegetables, fruits, and other crops is a practical, economical and a very responsible approach towards environment. Solar drying systems to dehydrate foods and other crops can add value, improve the quality of the product, and increase the shelf life without depending on conventional fuels and an opportunity for areas where availability of electricity is an issue. Innovative cabinet solar dryer developed by SEED can be efficiently adopted to process fruits, vegetables, cereals etc. Another innovative devise called blue filter developed by SEED can be used to retain micronutrients such as b-carotene, which otherwise leached out in direct solar radiation which contains the component of more U.V. light. Solar Food Processing Technology (SFPT) can be an excellent opportunity to process various agricultural and horticultural crops to produce ingredients for these nutritional and health supplements. SEED has successfully developed nutritional supplements using SFTP and demonstrated efficacy of these nutritional supplements. Adaptation of SFPT can be a excellent tool to produce nutritional and health supplements for different target groups. Nutritional supplements specific for different age groups and for different physiological status of the population such as puberty, women of child bearing age, pregnancy & lactation, etc can be developed processing of fruits, vegetables and other agricultural commodities using SFPT. Similarly, supplements targeting different diet related diseases such as diabetes, heath health, anticancer, antiaging, etc can be efficiently developed by processing appropriate agricultural commodities using SFPT.

SEED has already developed and commercialized some of the supplements and are being processed in rural areas. SFPT can be an excellent means to process fruits and vegetables in the production areas by the rural women and youth as an income generation activity as well as to produce these functional foods at the rural level.

Training Program On
'SOLAR FOOD PROCESSING OF FRUITS & VEGETABLES FOCUS ON NUTRITIONAL FOOD SUPPLEMENTS.
September 4 – 7th, 018.

Ms. R. Shaymala

Malnutrition is an endemic problem in South Asia and Sub Saharan Africa, often assuming epidemic proportions. Micronutrient malnutrition was generally addressed by administering appropriate synthetic vitamins and minerals. However, there is a significant shift in recent times from synthetics to naturals in addressing malnutrition in view of better acceptability, physiological tolerance and improved bio-availability of nutrients. Solar dried nutrient dense fruits, vegetables and other nutrient rich foods etc., assume great significance in this context. In view of the changing dynamics in favour of naturals for addressing macro and micro nutrient malnutrition, the training program held from 4-7 Sept. 2018 by SEED was specially tailored towards production of solar dried natural nutrient rich food ingredients for use in formulating Nutritional Supplements – for different age groups and physiological conditions. Over the years, SEED has developed special capability and expertise in development of nutritional supplements based on solar dried natural nutrient rich fruits and vegetables etc.

This training program was designed for prospective food processing entrepreneurs. 23 participants participated in the program with various back grounds- academia, food industry personnel, self-help groups, graduate students, NGO s etc.

Topics covered by the expert faculty consisted of Nutritional Supplements for different target groups, Selection of Ingredients for Nutritional Supplements; Processing of Ingredients for Nutritional and health supplement using Solar food processing; Design of Health Supplements & Nutritional Supplements; Fundamentals of Product Development etc., in addition to entrepreneur development opportunities with solar processed products. The participants were also introduced to the SEED Incubation center facility which can givestrategic support to the startupbusiness and help speed up the process from concept to market. The wide array of targeted resources and support services available at SEED Incubation Center and R&D facilities were also explained.

The training program gave an opportunity to the participants for gaining hands on experience in processing of Tomato, Ragi, Carrot, Pineapple, Mango and Fig.

The training concluded with a valedictory program and awarding of certificates. The response of the participants was overwhelming and there was overall appreciation for the programme.

SEED COMMUNICATIONS
A Quarterly News Letter

SKILL DEVELOPMENT PROGRAMMES IN SOLAR FOOD PROCESSING CONTRIBUTIONSBY 'SEED'

Ms. R. Shyamala & Dr. Y. Sreenivasulu

Solar Energy has emerged as a major non -conventional energy source for diversified uses – water heating, water pumping, street lighting, household cooking, etc. This renewable energy source has made a big impact in the area of food processing in recent times. Society for Energy, Environment and Development (SEED) worked intensely on perfecting the application of Solar energy for drying foods and developed an innovative solar cabinet dryer which was patented in 211911. The Solar cabinet drying systems have since been scaled up from a demo model to a capacity 500 kg . As a result of sustained R&D efforts, SEED has successfully developed processing technologies for over 96 products based on fruits, vegetables, forest produce etc., using Solar cabinet dryers. The technology is constantly being upgraded and scaled up for making the systems more efficient for drying and for improved retention of sensitive nutrients.

Skill Development programmes

Solar food drying systems are becoming systems of choice since the technology is highly innovative with zero energy cost and zero carbon emission. More than 250 SEED Solar Dryers are operating across the country and elsewhere in the world. This has created a need based opportunity to train manpower in the skills and process technology for solar powered food drying systems.

Skill development programmes aimed at processing technology and operational controls were planned and implemented for entrepreneurs across the country and also from abroad. SEED was successful in increasing the awareness levels in respect of the innovative low cost technology through several training and communication programs conducted over the last 15 years. Dedicated and focused development programs for skills enhancement, process technology and operational controls immensely helped in increased entrepreneur development and further capacity creation.

'SEED' conducted 69 training programs to impart appropriate skills and knowledge in Solar food processing technology for self-help groups, small farmers, NGOs and rural entrepreneurs.

The focus of the training programs was broadly as follows:

- Skill development for entrepreneurship and employment generation through small scale food processing enterprises.
- Solar food processing technology of a variety of fruits and vegetables for value addition and preservation including organic fruits and vegetables.
- Solar processing technology- Entrepreneurship opportunities.
- Planning and promotion of agro and food enterprises.
- Solar Food Processing for production of natural ingredients for use in formulating Nutritional Supplements.

SEED has so far trained about 600 entrepreneurs in Solar Food Processing at its main facility in Hyderabad and at its Extension center in Tholkatta village. The beneficiaries are evenly distributed among rural women (30%), entrepreneurs (20%), small farmers (20%), NGOs (15%) and SHGs (15%)

SEED is committed to further enlarge its training and skill development programs in content and expansion of solar cabinet dryers programmes for value addition, preservation and reducing post-harvest losses of fruits & vegetables.