

ACADEMIC PROGRAMME 2018 Research and Development

In 2018 SEED guided four M.Sc., Food Science students from Gitam University, Visakhapatnam to complete their project work as their fulfillment of completion of the course. From two months all four students worked as part of the R&D team and fulfilled their project work.

These students worked on various aspects of shelf life studies and nutritional parameters. On various aspects of SEED newly developed solar dehydrated fruit bars - custardapple fruit rolls, pineapple fruit rolls, pomegranate with pineapple fruit rolls and mixed fruit rolls. They are trained in new product development, analysis of the properties, analysis of bio active elements, sensory evaluation and shelf life of the products.

S.No	Name of the student, Course and University	Title of Project
1	P. Madhuri	Studies on Physico chemical, Nutritional, organoleptic and Microbial analysis of Solar dehydrated Custard apple rolls.
2	M. Bindu	Analysis of physicochemical parameters and shelf life studies of solar dehydrated Pineapple rolls
3	G. Prasanna	Quality attributes of solar dehydrated pomegranate with pineapple fruit rolls
4	SheenShaji	Assessment of Shelf life studies of solar dehydrated mixed fruit rolls.



From Left to right: Mr. Sheen Shaji, P. Madhuri, G. Prasanna and M. Bindu

OBITUARY



'SEED' regrets for the sad demise of Prof. Anuragcharvedi, a Member of 'SEED' & Retired Dean of Home Science, Prof. Jayashankar Telangana Agricultural University 13th March 2018. We lost an excellent scientist, teacher and beloved colleague whose contributions are highly valuable in 'SEED'.



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Formerly Dy. Director, DFRL, Mysore

Development of Nutritional Supplements to Service Personnel to Combat Fatigue and Environmental Stress at High Altitude



Sri. N. Narayan Prasad
Formerly Dy. Director, DFRL, Mysore

The project was conceived and initiated on 30.05.2015 to address the Objectives listed below, specially with special reference to the problem of oxidative stress experienced by soldiers stationed at High Altitude regions caused by extreme climatic conditions like low temperatures, low atmospheric pressures etc., through food appropriately enriched with nutrients and nutraceuticals

OBJECTIVES:

- To design and formulate certain Nutrient Supplements in the form of Ready-to-eat Bars by blending various food items such as Cereals, Pulses, Fruits, Vegetables etc which are known to be rich in Vitamin- C, β - Carotene, Vitamin E, Iron and Selenium, Pre-processed with Green Energy, in appropriate proportions to combat the Oxidative Stress normally encountered among Military Personnel, particularly stationed at High Altitudes.
- Nutrient Supplements will be in an easy to reconstitute and in compact form - Dehydrated Powders packed in suitable Flexible Packaging Material for long Shelf Life while facilitating transportation.
- The Antioxidant Rich Nutrient Barspacked in suitable Flexible Packaging Material for long Shelf Life while facilitating transportation shall be tested for their Antioxidant Potential, Shelf Stability and Organoleptic Quality as well as stress alleviation through experimentation with laboratory animals – Albino Rat Models.
- In case, the animal experiments show promising results, it will be subjected for field trials with soldiers during the final stage of the project.

During the first phase of the project two types viz., Ragi based and Moong based Antioxidant Rich Nutritive [ARN] Bars weresuccessfully developed using ingredients derived essentially from solar dried natural foods. The nutritional and health bars thus developed were calculated / evaluated to deliver about 50% RDA of nutritional and anti-oxidant components like Vitamins C, E, Selenium, Zinc, Iron, Carotenoids, Polyphenols and Flavonoids etc., per serving of 30 g per person per day in addition to his/her normal ration per day. On rigorous testing these bars have been found to be microbiologically safe and stable and the sensory attributes were rated as very good even at the end of 210 days of storage period and varied conditions without any significant changes of the antioxidant components /nutrients levels. During the second phase of the study the efficacy of the ARN bars in combating the oxidative stress induced in animals [Albino Rats] subjected to Swimming Exercise. These studies have been carried out at normal atmospheric conditions of temperature and pressure since the simulated high altitude conditions could not be created at the laboratory level due to inherent practical difficulties. The biochemical indices employed to assess the Oxidative Stress combating potential of our products formulated with solar dried natural raw materials have clearly indicated that these are very effective in mitigating the oxidative stress induced consequent to swimming. The project and the product have shown great promise for effectively using for personnel working at high altitudes to address the problems of oxidative stress and fatigue.



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SEED Participation in National and International Events

Mrs. R. Shyamala

Food Processing Industry Conclave 2018, Vijayawada

SEED was invited to participate at the **Food Processing Industry Conclave 2018** organized by The Federation of Telangana and Andhra Pradesh Chambers of Commerce and Industry at Vijayawada from 4th to 6th January, 2018. A comprehensive presentation on 'Innovative Solar Drying' was made by Dr. M. M. Krishna outlining the great economic and environmental advantages of the unique technology for appropriate applications aimed at value addition, higher income generation and overall prosperity of the farmers and rural households. The center of attraction at the Expo was the SEED Solar cabinet dryer and Solar dehydrated food products.

International Conference on Innovation, Incubation and Industrialization, Visakhapatnam

SEED was a special invitee at a very important International Conference on Innovation, Incubation and Industrialization organized by the Association of Lady Entrepreneurs of India-2018, at Visakhapatnam from 17 to 19 January, 2018. SEED participated at this international event as a special invitee in the backdrop of the keen interest of SAARC Countries in Solar Cabinet Dryers. The

Conference inaugurated by Sri N. Chandra Babu Naidu, Hon'ble Chief Minister of Andhra Pradesh was attended by a large galaxy of participants from SAARC Countries- Policy makers, Bureaucrats, Entrepreneurs and Self help groups

Mrs. R. Shyamala, Gen Secretary, SEED made a comprehensive presentation on the innovative Solar dehydration technology and its application to agri-horticulture produce for value enhancement and shelf life extension. She explained how this low cost and green energy based technology can bring in a plethora of economic benefits to a large cross section of people – farmers, rural entrepreneurs, self help groups etc.

The Solar Cabinet Dryer and solar dried food products displayed at the expo was the most visited and the center of attraction at the event.

The interest evinced by the visitors was so high, they even bought the Solar Cabinet Dryer, SDM – 8, showcased at the Expo. Mrs. Shyamala and team met with and had detailed discussions on the benefits and applications of solar food processing technology with more than 1000 women entrepreneurs, farmers, self help groups etc., who were keen to start micro enterprises in food processing.



R & D ACTIVITIES

Seed's Research Log Book - Development Of Pineapple Fruit Rolls

INTRODUCTION:

The pineapple (Ananascomosus) is a tropical plant with edible multiple fruit consisting of coalesced berries, and the most economically significant plant in the Bromeliaceae family.

Fresh pineapple is often expensive because of its delicate nature. Pineapples continue to soften at appropriate temperatures after harvesting. The shelflife of fully maturedpineappleis short and limited to 4-6 days and the average yield of processing ranges from 45-55%.

Pineapple is commonly found in Indian market and is being consumed raw and also processed into various food products, including jam, juices, puree, powder and nectar. An innovative and new approach is to convert the pineapples into ready to eat and nutritious bars. This would help the farmers realize better revenue through significant value addition.

HEALTH BENEFITS OF PINEAPPLE:

Pineapple is low in calories, while being a rich source of fibre. Pineapple is an excellent source of antioxidants. Pineapple fruit contains a proteolytic enzyme bromelain that digests food by breaking down protein. Bromelain also has anti-inflammatory, anti-clotting and anti-cancer properties. Studies have shown that consumption of pineapple regularly helps fight against arthritis, indigestion and worm infestation. Pineapple is also known for its high level of manganese. The Manganese mineral is an essential element for energy production, while protecting cells from free radicals.

Ingredients: Pineapple pulp, Sugar, Citric acid, Pectin, KMS, Maltodextrin , water.

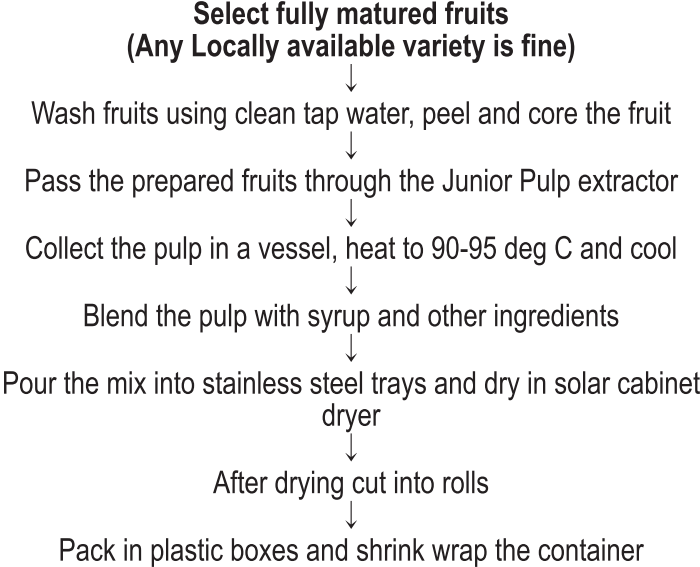
Preparation of Pulp:

Fully matured, soft and fresh pineapples were selected, washed, peeled, thorny eyes were removed and cut them into pieces. These pieces were made into pulp using pulp extractor.

Pineapple puree was heated at $90 \pm 5^{\circ}\text{C}$ while stirring with an automatic pot stirrer.

Bar Preparation: The pulp obtained was collected in a vessel and blended with sugar syrup and other classII preservatives and spread into a stainless steel trays which is to be solar dried for 16 sunny hours for 2 layers and cut into convenient rolls/bars and packed in suitable packing material for long shelf life

FLOW CHART: 1

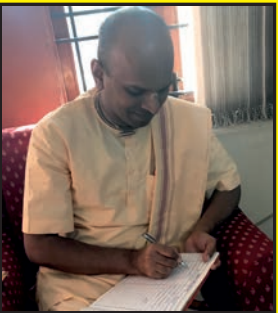


SOLAR DRYING DATA SDM 50

S. No.	Product	Drying Conditions						
	Items	Loading Capacity Kg /m2	Per Tray kg	Yield (%)	Finished product Moisture (%)	Drying Hrs	Cabinet Temp. (°C)	Ambient Temp. (°C)
1	Pineapple fruit bar (2 layers)	7	2	40	12	16	55	32

BY BHARATHI AND SREENIVASULU

VIP Comments:



SWAMY YAGNESHWARADASU
AKSHAYAPATRA FOUNDATION

Yagneshwar Dasu
The Akshaya patra foundation.

It's an excellent initiative helping rural men and women... Looking forward to work with you in near future.