



# Central Institute of Post Harvest Engineering & Technology Ludhiana

Our Slogan: Produce, Process and Prosper

CIPHET E - Newsletter for July 2011  
Vol. 6 No. 7

## Director's Column



Dear All

One of our colleague, Dr. M.R. Manikantan, Senior Scientist has been awarded the coveted Jawaharlal Nehru Award for Outstanding Doctoral Thesis Research in Agricultural and Allied Sciences, 2010 in Agricultural Engineering.

Achieving a new landmark in research, the institute has developed an ohmic heater for stabilization of rice bran oil. The technology, which would help in scale up the production of rice bran oil and increasing its shelf life, is first of its kind in the country.

A Chennai based entrepreneur obtained the technology of making biscuits and bread from black rice, the variety which is widely consumed in China.

Ms. Jaswinder Kaur Saini, Private Secretary was relieved after qualifying service of twenty years.

The institute published its "Annual Report (2010-11)" and "CIPHET News (April-June, 2011)". These documents highlight the significant progress of the institute in research and extension activities.

With best regards

**R.K. Gupta, FIE**  
Director (Acting)

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## **CIPHET Scientist Received the Jawaharlal Nehru Award**

The Jawaharlal Nehru Award for Outstanding Doctoral Thesis Research in Agricultural and Allied Sciences, 2010 in Agricultural Engineering was awarded to Dr. M.R.Manikantan, Senior Scientist, FG&OP Division, CIPHET, Ludhiana. He received the award from Sh. Sharad Pawar, Union Minister of Agriculture, Sh.Harish Rawat and Sh.Charan Das Mahant, Union Ministers of State for Agriculture on 17<sup>th</sup> July, 2011 on the occasion of ICAR Foundation Day Ceremony. Dr.



M.R.Manikantan has developed high barrier and more strong nanocomposite films from commercially available polymer bases such as polypropylene and polyethylene by industrially viable melt intercalation method using the advanced nanocomposite technology. This study was chosen by him as commercially available polymer based food packaging materials exhibit oxygen and water vapor permeability and migration of polymer compounds into the foodstuff. Dr. M.R.Manikantan carried out the research work under the guidance of Dr. N.Varadharaju, Professor and Head, Post Harvest Technology Centre, Agricultural Engineering College and Research Institute, Tamilnadu Agricultural University, Coimbatore-3.

## **Ohmic heating technology for processing of rice bran**

Achieving a new landmark in research, the institute has developed an ohmic heater for stabilization of rice bran oil. The technology, which would help in scale up the production of rice bran oil and increasing its shelf life, is first of its kind in the country. On July 2, 2011 CIPHET Director Dr R. K Gupta transferred this technology to V. Gowathaman of Chennai.



Senior Scientists Dr Devinder Dhingra and Dr Sangeeta Chopra, who have developed ohmic heater for rice bran, said that ohmic heating is most advanced technology available anywhere in the world. Through, ohmic heating many important ingredients can be preserved and also its shelf would get improved manifolds. This method of heating is also good for large scale production. Mr. V. Gowthaman , who got the technology, said that he oil processed through ohmic heating is far superior than conventional methods.

## **Biscuits and bread from black rice technology**

The institute on July 4, 2011 transferred the technology of making biscuits and bread from black rice, the variety which is widely consumed in China and is also known for its health benefits. Dr P.R Bhatnagar, Project Coordinator (APA), today transferred the technology to V. Gowthaman of Chennai. The biscuits and bread developed from the black rice would be rich in anti-oxidants, fibre and anti-aging properties. Senior Scientist Dr Mridula Devi, who has



standardized the process, said that biscuits and bread developed from black rice would also be useful for cancer patients due to presence of anti-oxidants. Black rice is unique grain and has lot of health benefits. Black Rice is a heirloom rice cultivated more in China. It looks black when it is raw but after cooking its colour changes to deep purple.

## **Personalia**

Ms. Jaswinder Kaur Saini, Private Secretary was relieved on 20-07-2011 after qualifying service of twenty years.

## **Publications of the Month**

**CIPHET Annual Report (2010-11):** The executive summary of the annual report 2010-11 is as under;

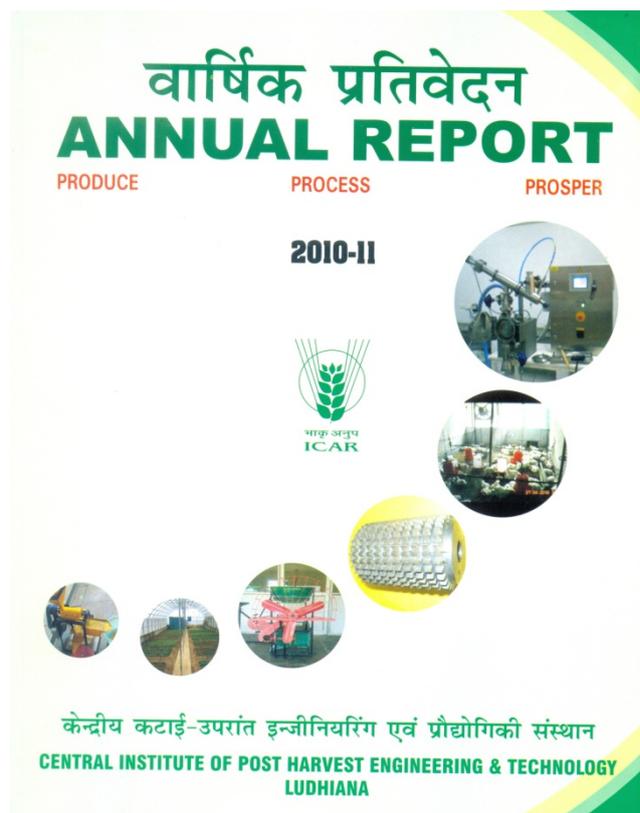
The institute made significant progress in research and extension activities during the reported period of 2010-11. These activities were accelerated through in house and externally funded projects. The research projects covered the areas of value addition of food grains, oilseeds, spices, fruits and vegetables, storage of fruits and vegetables, environment control of cattle and poultry houses, development of tools and equipments for banana, mango and other crops, non-destructive techniques for quality determination and diversified value added products from meat. Dissemination of technologies were done through licensing of technologies, publications, presentations and training of entrepreneurs and farmers.

Physicochemical and microbiological quality of nine varieties of fresh & stored mangoes was evaluated for nondestructive study of quality of mango. A common maturity index was formulated for prediction of maturity of mangoes. One hundred and twenty seven bacterial and 20 fungal strains were isolated from mango surfaces. A rapid method for prediction of adulteration of mango juice was developed. Pomegranate peel extract showed potential application as antimicrobial agent. A pelletizer of 10-15 kg/h capacity has been tested for making pellets from rice straw, bagasse, cotton stalk and sweet sorghum without use of binder. An integrated pilot plant has been installed for hydrolysis and fermentation of crop residues. The process of partial mechanical dewatering prior to dehydration was optimized to get minimum energy consumption and maximum pungency retention in drying of onions. The best combination was 59.43 % dewatering and drying at 68.29 0C for Agrifound dark red onion.

The effect of fan-pad and fan-fogger cooling systems was observed to be significantly better for broiler production than control. The average body weight of broiler chicks after 6th week was 16 % and 10.4 % more in fan-pad and fan-fogger cooling systems than that in control and the mortality of chicks kept in shelters cooled by the cooling systems was significantly

low. The effect of fan-pad and fanfogger cooling systems was found to be better for increasing milk production in cattle as compared to control group.

Energy bar samples rich in Omega-3 fatty acid have been prepared from mixture of flaxseed, cereals, and pulses with varying levels of sweeteners and were found to be acceptable. Cryogenic grinder was used to prepare ground spices from black pepper, coriander, turmeric, fenugreek and cinnamon seed at low temperature. Process protocols were developed for value added products from pearl millet and barley including *daliya*, *suji*, *atta*, instant *halwa*, instant *ladoo*, pasta etc. A peanut deskinning machine of capacity 60-75 kg/h has been developed with the deskinning efficiency of 60-70 % and over 35-40 % whole kernels were obtained from the machine.



Dehulling of pigeonpea was done by microbial growth and *Asperigillus* pretreatment produced more dehulled kernels in pigeonpea than *Trichoderma*.

Foam mat drying of tamarind pulp resulted in better quality of tamarind powder. *Channa* sweet was prepared from 70:30 blends of peanut milk and standard milk and found to be of acceptable quality. A hand tool made from wood has been developed for litchi peeling. A dehuller with throughput capacity of 70-80 kg/h has been developed for dehulling guar gum with maximum efficiency of 92 %. A fruit harvester cum saver for harvesting of jamun/aonla and a ber grader of 500 kg/h capacity with efficiency of 90-92 % has been developed. The shelf life of guava was assessed by using coating from cassava starch, chitosan, rice/turmeric, carnauba wax and enhanced shelf life was achieved.

The power factor of machines in APC and cattle pilot plant under no load conditions varied from 0.2 to 0.76 and need automatic power factor correction systems. A fish descaling machine has been designed with different cylindrical descaling heads. Extruded feed has been made from mixture of potato wastes, cereals, oil cake, husk and molasses. The enzymatic/chemical process for extracting of dietary fibre from potato peel was standardized, and was used to make biscuits and chapattis.

Around 210 news clippings, 11 television programs , 15 radio programmes were published/broadcasted for effective dissemination of agro-information and an exhibition on showcasing of technologies was also organized at CIPHET. The trainings have been conducted for women and men inmates of Central Jail, Ludhiana, for preparation of ginger powder, garlic slices, value-added meat products, extruded snack products, mixed pickle and carrot candy and jam/jelly in order to create awareness among them regarding self employment opportunities.

Various training programs sponsored by ATMA and other government agencies were conducted for the farmers and officials from different states in the areas of post harvest technologies and establishment of APCs in rural catchments. The AICRP on post harvest

technology and application of plastics in agriculture have also developed many useful technologies.

As many as 35 technologies were licensed to entrepreneurs/farmers. These technologies included groundnut and soybean based flavored beverage, curd and paneer, technology for preparing green chilli powder and green chilli, paste/puree, meat and poultry processing and value addition technologies, evaporative cooled room (2 tons), CIPHET evaporative cooled structure (5 tons), microencapsulator for encapsulation of food ingredients, manufacturing guava leather/bar, onion flakes and onion powdering technology, ready to constitute makhana kheer mix, protein enriched ready to eat extruded products. A good number of research papers were published. The scientists of the institute participated in various conferences.

## CIPHET News (April-June, 2011)

Produce      Process      Prosper



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### FROM THE DIRECTOR'S DESK

The second quarter of year 2011 was marked with new milestones in research and transferring technology to end users. Technologies like stabilization of rice bran by ohmic heating, effect of pomegranate peel extract and vacuum packaging on shelf life of goat meat and modified atmosphere packaging of mushrooms (MAP) were developed and standardized during this period. Total of 11 technologies were licensed to 16 entrepreneur/farmers across the country. While two days workshop on extrusion in collaboration with Assocham was held at Punjab Agricultural University, CIPHET also played a lead role in the first national committee meeting on post harvest technologies held in New Delhi. A delegation led by the Director General, ICAR met Punjab Chief Minister to work on more possibilities in different areas of agriculture, dairy and fisheries sectors in the state by adopting result oriented approach and establishing commodity oriented research stations.





Dr. R.K. Gupta

### SECTORAL NEWS

**IIT Mandi and Government of Himachal Pradesh to develop post harvest information system**  
A five-member committee comprising members from the Indian Institute of Technology (IIT), Mandi, and the Agriculture Department has been constituted for developing a system that uses post-harvest technology and mobile telephony to benefit farmers. The government has notified the core working group comprising members from both IIT, Mandi, and the Agriculture Department that will monitor and exchange information from time to time. The idea is to work in close association in solving the problems being faced by the farm sector while dealing with problems like productivity, slumps in the markets and the lack of post-harvest technology. IIT, Mandi, would provide the technology for the post-harvest management that would help farmers in growing vegetables and fruits both in farms and poly-houses across the state of Himachal Pradesh.

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- From the Director's Desk
- Sectoral News
- Institute / Divisional News
- Research Highlights
- Programmes organized
- Papers published
- Technologies commercialized

**Workshop on extrusion processing**  
The two-day international workshop on 'extrusion processing' was organized at Punjab Agricultural University (PAU) from 8-9 April at its Farmers Service Center. During the workshop various aspects of processing, food storage and extrusion technologies were taken up for discussion.

Central Institute of Post Harvest Engineering & Technology, Ludhiana, (Punjab)

## Technology of the Month

### Pellet Durability Index Tester

Durability is one of the most important qualities of pellets. It is defined as the ability of pellets to withstand destructive loads and force during transport. In feed manufacturing, pelleted feeds are subjected to shearing and abrading actions during transportation. This induces fines in the feed. For the purpose of feeding ease, pellets need to have certain resistance against the stresses exerted on them during transportation and distribution to the animals.

Pellet durability index tester was used to evaluate the durability of pellets. Pellet durability was determined according to ASABE Standard S269.4 (2007). A sample of pellets was sieved on a No. 6 U.S. sieve with aperture size of 3.36 mm to remove fines. A 100g sample of sieved pellets was tumbled at 50 rpm for 10 min in a dust-tight enclosure. After tumbling, the sample was removed and sieved, and the percentage of whole pellets was calculated using the following formula:

$$\text{Durability (\%)} = \frac{\text{Mass of pellets after tumbling}}{\text{Mass of pellets before tumbling}} \times 100\%$$

Durability is considered high when the computed value is above 80%, medium when the value is between 70-80%, and low when the value is below 70%. Low pellet durability is not desirable as it can cause problems such as disturbance within pellet feeding systems, dust emissions, and an increased risk of fire explosion during pellet handling and storage.



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