



# Central Institute of Post Harvest Engineering & Technology Ludhiana

**OUR SLOGAN: PRODUCE, PROCESS AND PROSPER**

**CIPHET E – Newsletter for April, 2010  
Vol. 5 No. 4**

## Director's Column



Dear All

The KVK-interface 2010 held this month provided a very good opportunity to share with them the benefits of production catchment processing and scope of establishing model agro processing centre at each KVK. If such facility is established at each KVK, it will help in sharing the benefit of value addition by the farmers and consumers will get processed product of high quality at affordable cost.

Under human resources development, the scientists of the institute were deputed to leading institutions in USA for exposure on advanced techniques, methods and recent developments in post harvest engineering and technology. These were funded by NAIP. Dr S N Jha, Head AS&EC Division attended an international training on Advances in NIR Spectroscopy for nondestructive evaluation of quality of fruits from 15<sup>th</sup> Sep 2009 to 12<sup>th</sup> Jan 2010 at University of Wisconsin, Madison, WI, USA. Dr D R Rai, Principal Scientist, CIPHET, attended training at School of Packaging during January-February, 2010 at Michigan State University, USA. Dr Devinder Dhingra, Senior Scientist attended training on "Application of Nanotechnology in food processing" during 1 January, 2010 - 31 March 2010 at Rutgers, The State University of New Jersey, New Jersey, USA. Dr Vinod Bhargav Scientist (SS), and Dr. S K Tyagi, Principal Scientist CIPHET were deputed for training in the area of fermentation technology in the Bio processing laboratory at Department of Biological and Agricultural Engineering, Weaver Labs, North Carolina State University, Raleigh, NC, USA. All these areas are very relevant to the research being conducted in CIPHET. The training and exposure visits will be of great help to the institute.

The infrastructure facilities of the institute were also strengthened by the addition of state of the art equipment. SPR (Surface Plasmon Resonance) equipment and high pressure homogenizer have been installed at CIPHET costing around Rs. 98 lakhs and Rs. 10 lakhs, respectively. SPR biosensors are widely used for detection of pathogens, toxins, pesticide and antibiotic residues based on either enzyme inhibition or antigen antibody binding. The operating pressure of high pressure homogenizer is up to 40,000 psi. It's applications include cell disruption, nano-emulsions and homogenization.

The institute has also initiated new program on All India Radio, in collaboration with AIR Jalandhar. It has been named as 'Do Dooni Chaar'. The name of the programme indicates that by adopting post harvest processing an entrepreneur or farmer can earn twice of his investment. The curtain raiser programme was recorded by Director CIPHET. It was on mandate and various activities of CIPHET. It is being followed by programmes on various selected technologies for the farmers and the entrepreneurs. Total of ten programmes are scheduled to be aired from May 5 to July 7. CIPHET has initiated unique training programme in Ludhiana Central Jail for prisoners with aim to train them to earn respectful living after they get released from the jail. As part of the training programme, on 19<sup>th</sup> April prisoners were made aware about potential of the powder making process from garlic, garlic and onion and benefits of value addition. Technologies on processing of meat into value added products, green chilli powder and processing of guava were transferred to entrepreneurs.

18 participants (15 Men and 3 Women) from CIPHET participated in various activities held during Zonal Sports Meet (Zone-IV) at IIPR Kanpur under leadership of Dr. S. K. Nanda, Chief De-Mission.

**With best regards**

**R.T. Patil  
Director**

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## **KVK Interface-2010**

The KVK Interface-2010 was organized by the Division of Agriculture Extension, Indian Council of Agricultural Research (ICAR) during April 26-27, 2010. The ICAR has 571 KVKs spread over length & breadth of the country. Almost every district has got one KVK which serves about 4 lakh hectare area for technology transfer. Recently, an initiative has been taken to e-connect 192 KVKs for quick and effective sharing of appropriate technologies and ideas among all stakeholders. During the last three years, the KVKs conducted 2.86 lakh on farm trials and frontline demonstrations and trained 36.84 lakh farmers and 2.73 lakh extension personnel. The two-day interface deliberated upon various technical issues including mechanization & post harvest management value addition for further strengthening the national network of KVKs.

The meeting was inaugurated by Prof. K.V. Thomas, Hon. Minister of State for Agriculture. Prof. Thomas stressed that a mechanism should be evolved to encourage the performance of Krishi Vigyan Kendras (KVKs) and provision for special assistance can be made for further enhancement in their capacity. He further emphasized that KVKs are effectively providing a common platform to the scientists of ICAR, State Agricultural Universities and other stakeholders to deliberate on various issues concerning application of new technologies and market opportunities.

Dr. S. Ayyappan, Secretary, Department of Agricultural Research and Education (DARE) and Director General, ICAR called for introspection of KVKs and then reinvent themselves. He emphasized on the need for convergence between KVK-MNREGA and other government social schemes for socio-economic development of farmers. Dr. Ayyappan added that every KVK should try to work as a knowledge-driven centre at district level where farmers can seek solution of their problems.

Sri Rudra Gangadharan, Secretary, Animal Husbandry, Dairy and Fisheries and Sri Rajiv Mehrishi, Secretary, ICAR also graced the occasion. Dr. K.D. Kokate, Deputy Director General (Agricultural extension), ICAR elaborated the role of KVKs in technology dissemination at ground level and informed that KVKs are providing a number of innovative services to farmers including agro-advisory through mobile, agro-alert system and special demonstration at farmers fields.

In a special session in the afternoon of April 26, 2010 jointly chaired by Dr. M.M. Pandey, DDG (Engg) and Dr. K.D. Kotate, ADG (Extn) and moderated by Dr. A.K. Mehta, ADG (Extn); the following two presentations were made from engineering division.

1. Model Agro Processing Centres for KVKs. – Dr. R.T. Patil
2. Role of Mechanization in current scenario.- Dr. Pitam Chandra

The KVKs can generate greater revenue from their produce by establishing model agro processing centre for the crops grown by them and also in their neighborhood. The processed product made with scientific methods and by maintaining proper hygiene and sanitation at KVK level will help in training and demonstration of upcoming entrepreneurs. If such facility is established at each KVK, it will help in sharing the benefit of value addition by the farmers and consumers will get processed product of high quality at affordable cost.

## **Non-Destructive Quality Evaluation of Fruits**

Dr S N Jha, Head ASEC division attended an international training on Advances in NIR Spectroscopy for nondestructive evaluation of quality of fruits from 15<sup>th</sup> sep 2009 to 12<sup>th</sup> Jan 2010 at University of Wisconsin, Madison, WI under NAIP sub project on Development of Nondestructive systems for evaluation of Microbial and Physico-chemical quality parameters of Mango. The theme of the training was to learn the advances in spectroscopy, new analysis techniques and exposure of recent work being done in the field of Nondestructive methods of Quality Evaluation of Food in USA.

During the course of training different laboratories such as Food Engineering laboratory, Environment Control Laboratory, Machinery and Agriculture Structure laboratories of the university were visited. Few universities/institutes such as Illinois Institute of Technology (IIT), Chicago, Southern Illinois University, Carbondale, Food and Drug Administration laboratory situated in IIT, Chicago campus where lot of work on food quality and safety are being conducted, were visited during the course of training.



**Dr. Jha with Prof. Gunasekaran and his team of researchers**

A new technique Attenuated Total Reflection (ATR) Fourier Transform Infrared (FTIR) Spectroscopy in conjunction with chemometric analysis including classification theory and analysis were learnt practically during the training using mango juice as sample.

ATR-FTIR spectral data were acquired and analysed which indicated that it can be used to predict the adulteration of mango juice by added sugar. The detection limits at 5 % significance level were 1 % for samples having no mango juice at all, 3 % for samples with low natural TSS, 5 % for samples having natural TSS more than 10 %, and 3.6 % in commercial mango juice. ASC, TSS and RJC were predicted very reliably with multiple correlation coefficient of 0.99 and 0.98 in the wavenumber range of 1476 to 912  $\text{cm}^{-1}$  using partial least squares regression and three wavenumbers (1088, 1050, 991  $\text{cm}^{-1}$ ) using multiple linear regression, respectively. The technique learnt can be replicated for development quick and reliable technologies for detection of adulterants, which is a very important aspect of food quality and safety. Design aspect of the NIRS equipment was discussed and got some idea for their development in our country during the course of training.

## Smart Packaging of Foods

Food packaging encompasses a number of technologies as well as materials for shelf-life extension, quality and safety of fresh and processed food materials. Smart packaging is a combination of various techniques such as controlled release mechanisms etc. to protect the shelf-life and quality of the packaged food. The School of Packaging at Michigan State University, USA supports packaging industry by educating students who are interested in employment in the industry, by conducting research to solve packaging problems and develop new technology which can be used by the industry, and by providing education programs and other services to the industry. Dr D R Rai, Principal Scientist, CIPHET, attended training at School of packaging with the expert Dr. Eva Almenar during January-February, 2010. The training comprised of introduction to cyclo-dextrins and the inclusion compounds (ICs) to be used in the normal packaging materials whose release is moisture dependent. Packaged food generates relative humidity which spoils the food. However, the same conditions could be exploited for the benefits of food as the ICs would release themselves in a controlled fashion and would act against the harmful pathogens. I got the first hand training on laboratory and equipment to be



**Lab facility at Michigan State University, USA**

utilised including a Flame Ionisation

Detector based Gas Chromatograph. I studied the release mechanism in packages with in the relative humidity range generated through saturated salt solutions of 0-100 %. The data so generated indicated that the release mechanism is relative humidity based and the release is directly proportional to relative humidity in the package headspace. These results would be applied to packaging in Indian context in our future research and training for saving on quality and shelf-life of food materials. The visit will also help us establish similar facilities at our place for research and training.

## Application of Nanotechnology in Food Processing

Dr Devinder Dhingra, Senior Scientist attended training on “Application of Nanotechnology in food processing” during 1 January, 2010 - 31 March 2010 at Rutgers, The State University of New Jersey, New Jersey, USA. Nanotechnology has opened new avenues

in the research and development of food technology. It is being used as a means to understand how physiochemical characteristics of nano-sized substances can change the structure, texture and quality of food. Application of this area already span development of improved tastes, color, flavor and consistency of foodstuffs, increased absorption of nutraceuticals and health supplements, new food packaging with improved barrier, mechanical or antimicrobial properties, and nanosensors for traceability and monitoring the conditions of food during transport and storage.

Nanotechnology derived food packaging materials is the largest category of current nanotechnology applications for the food sector. Food packaging materials with improved mechanical, barrier and antimicrobial properties are of interest, and also nano-sensors for traceability and monitoring of conditions of food during transport and storage. Packaging materials for foodstuff, like any other short-term storage packaging material, represent a serious global environmental problem. A big effort to extend the shelf-life and enhance food quality while reducing packaging waste has encouraged the exploration of new, nanotechnology-based materials.

Polymer composites are mixtures of polymers with inorganic or organic additives. Appropriately adding nano-particles, to a polymer matrix can enhance its performance, often in very dramatic degree, by simply capitalizing on the nature and properties of the nanoscale filler. With nanotechnology fillers, the composites can exhibit significant improvement in modulus, dimensional stability and resistance to humidity or gas. Other advantages include low density, transparency, better surface properties, fire resistance and recyclability. Due to very large aspect ratios, a relatively low concentration of nano-particles is sufficient to change the properties of a material. These benefits have led to the development of a variety of nano-reinforced polymers, commonly referred to “nano-composites”, which typically contains up to 5% nano-particles.



**Dr D Dhingra with Atomic Force Microscope at Rutgers University**

Chitosan, zein, starch etc. are also bio-polymers and these are being exploited to develop new materials for packaging and coating applications in food industry. Chitosan-PVA and Chitosan-PVA-glycerol blends were prepared and their atomic structure and other characteristics were evaluated. Atomic force microscopy in tapping mode was used to study the surface characteristics of the films. Fourier transform infrared spectroscopy, contact angle measurement, texture analyser and differential scanning calorimeter were used to measure various characteristics, such as miscibility of components, hydrophobicity of films, mechanical strength, glass transition and melting point.

The other important areas of nano-technology in food science are: nano-emulsions, nano-delivery systems for flavours, antimicrobials, and nutraceuticals, in which research activities in the field of nanotechnology for foods is which have potential applications of Biological efficacy of nano-encapsulated functional foods, Milk nanofibers/nanotubes, electrospun fibres, nano-filtration, nano-sensors and nano-tracers in food safety and biosecurity, nano-catalysts in improving chemical / bio-chemical reactions, nano-dispersions.

## **Fermentation Technology**

Dr Vinod Bhargav Scientist (SS), and Dr. S K Tyagi, PS, Chem Engg were deputed for training in the area of fermentation technology in the Bio processing laboratory at Department of Biological and Agricultural Engineering, Weaver Labs, North Carolina State

University, Raleigh, NC, USA. Application areas commonly associated with bioprocess engineering include the production of biofuels, design and operation of fermentation systems, development of food processing systems, application and testing of product separation technologies, design of instrumentation to monitor and control biological processes. The lab has MoU with the M/s Novozymes North America Inc., Franklinton, NC for providing support and enzyme for the research studies. Dr Bhargav worked on novel oxidative pretreatment of switchgrass for hydrolysis and fermentation. The switchgrass consists of 18 % lignin which inhibits enzyme amenable for hydrolysis to sucrose. Ozone is a powerful oxidant and generally reacts with organic substrates by ionic cyclo-addition and subsequent cleavage of olefinic and aromatic bonds. Hence, switchgrass was pretreated with ozone in gaseous phase for delignification. The acid insoluble lignin in switchgrass could be reduced from 16.64 % to 6.85 % during the treatment of switchgrass with 45 mg/l ozone and



**Dr V K Bhargav in the Bio processing laboratory at Department of Biological and Agricultural Engineering, North Carolina State University, Raleigh, NC, USA.**

0.375 lpm flow rate. During the training novel techniques like ozonation of biomass, ultrasonication of biomass, delignification of biomass through oxidative treatment, enzymatic hydrolysis, fermentation at flask level and batch level were learnt.

India has about 800 million tonnes of cellulosic and lignocellulosic material in the form of straw, forest waste, agricultural residue and processing waste. It is being used for fuel and animal feed purpose only. The conversion of lignocellulosics to value added products holds great promise as these residues can be enzymatically saccharified to hexose and pentose sugars after certain pretreatments required for making the residues amenable for enzymatic action. The Institute programmes in operation at CIPHET are aimed at optimization of parameters for production of cellulose and other enzymes from agro-residues/biomass and by-products like rice straw, fruit and vegetable residues etc. The near future goal includes development of cost effective technologies for production of organic acids, biosurfactants and fuel ethanol through fermentation using agro-residues. The Skill acquired through advanced training in the said area would be utilized in development of effective and economic technologies for production of value added products through fermentation. The training in this area to the scientists of NARS will be organized incorporating the foreign expert in the field.

### **Interactions with NIFTEM and NIRJAFT**

Dr R K Gupta acted as an expert member in two day workshop on curriculum development for NIFTEM on 24-25<sup>th</sup> April 2010 at India Habitat Centre, New Delhi. During the above workshop, the various expert groups proposed draft curricula for B.Tech. in Food Processing course for NIFTEM. For developing of syllabus for each specialized paper, there was a core group expert from the industry as well as academia, who have interacted with each other during the meeting. Dr Gupta from CIPHET, was associated in curriculum development for the elective papers for the subject entitled Science and Technology of Plant Foods which

includes the paper on Fruits and Vegetables Processing, Cereals, Pulses and Oilseeds Processing Technology and Spices, Tea, Coffee Processing and Value Addition.

Dr R K Gupta, visited NIRJAFT, Kolkata and held discussions with Dr K K Satpathy, Director, NIRJAFT, scientists and technical personnel for possible collaborative projects pertaining to use of Fibre and allied material for PH loss reduction as well as shelf life enhancement of horticultural produce besides use of the above material for mulching to conserve moisture and enhancement of productivity for high value fruit and vegetable crops. With the discussion following areas have emerged where, collaborative projects may be undertaken between CIPHET and NIRJAFT in the area of PHM of horticultural produce:

1. Design, development and evaluation of Farm Storage facility using Jute Caddies (Industrial waste jute material) for short term storage of horticultural produce of semi-arid region.
2. Evaluation of Jute Caddies (Industrial waste jute material) laminated CFB boxes for packaging, handling and transportation of fruits and vegetables.
3. Application of industrial waste jute material for mulching in selected fruit and vegetable crops for enhanced productivity.

The detailed inter-institutional project proposals will be developed and submitted for consideration.

### **Installation of Surface Plasmon Resonance (SPR) Unit at CIPHET, Ludhiana**

Surface Plasmon Resonance (SPR) Unit was installed in Agriculture Structures and Environmental Control Division at CIPHET, Ludhiana at a total cost of approx. Rs 98 lakhs. SPR biosensors are widely used for detection of pathogens, toxins, pesticide and antibiotic residues based on either enzyme inhibition or antigen antibody binding. The SPR method detects molecules bound to a ligand that is covalently attached to a solid surface. As the density of biomaterial on the surface increases, changes occur in the refractive index at the solution or surface interface. This change in the refractive index is detected because the angle or wavelength at which the incident light is absorbed at the surface changes upon binding. The difference in the angle or wavelength is proportional to the amount of material bound on the surface, giving rise to a signal that is termed surface plasmon resonance (SPR).

The development of fast, on-line and accurate sensing using SPR opens up opportunities for biosensors in many different agricultural areas —*in situ*

analysis of pollutants in crops and soils, detection and identification of infectious diseases in crops and livestock, on-line measurements of important food processing parameters, monitoring animal fertility and screening therapeutic drugs in veterinary testing.

The SPR methods also can be used to bio-molecular interaction analysis such as protein-protein, protein-DNA, DNA hybridization, kinetics and thermodynamics of



**Surface Plasmon Resonance (SPR) Unit**

interaction which could be useful in basic research to understand phenomena at molecular level in vivo.

### **Installation of High Pressure Homogenizer at CIPHET, Ludhiana**

High Pressure Homogenizer was installed in Agriculture Structures and Environmental Control Division at CIPHET, Ludhiana at a total cost of Rs. 10 lakhs. The operating pressure is up to 40,000 psi. The minimum batch volume is 10 ml and constant flow through capacity of 44 ml/min. The applications include cell disruption, nanoemulsions and homogenization.



**High pressure homogeniser**

### **MOU for DO DOONI CHAR to Spread Message of Food Processing**

Every week CIPHET scientists would be airing new technologies on All India Radio. The institute has initiated a new informative programme on post harvest “DO DOONI CHAR” in collaboration with All India Radio, Jalandhar. The name of the programme indicates that by adopting post harvest processing an entrepreneur or farmer can earn twice of his investment. This programme is aired every Wednesday at 7 PM (evening).

The programme is aimed at dissemination of information regarding various food processing technologies developed by the institute and consultancy available for farmers/entrepreneurs to increase their income level. Dr R. T Patil Director CIPHET, in the curtain raiser programme aired on May 5 made the audience aware about mandate of institute and what it could offer to rural masses of Punjab and surrounding states in post harvest. In the following programmes scientists would be explaining about various technologies developed by the institute and benefits farmers/entrepreneurs could get from them. Total of ten programmes are scheduled to be aired on All India Radio, Jalandhar from May 5 to July 7 as per schedule.

<b>Sr. No.</b>	<b>Scheduled programme</b>	<b>Speaker</b>
1.	Introduction to CIPHET- A curtain raiser	Dr. R.T Patil, Director CIPHET
2.	Utilization of potato waste for feed and food uses	Dr. Devinder Dhingra
3.	Packaging of fruits and vegetables	Dr. Deepak Raj Rai
4.	Value added products from Guava	Dr. Ramesh Kumar
5.	Scope of meat based products in Punjab	Dr. Suresh Devatkal
6.	Garlic, ginger and onion powder making technology	Dr. D.M. Kadam
7.	Green chillies paste and powder	Dr. Dilip Jain
8.	Modern Dal Milling technology	Dr M.R Manikantan
9.	Processed products from soybean and groundnut	Dr. D.N. Yadav
10.	Evaporative cooled rooms for farm level storage	Dr. Sangeeta Chopra



## CIPHET'S Meat Processing Technologies Attract Entrepreneurs

CIPHET has taken another innovative initiation in the field of meat processing. It is commercializing the meat processing and value addition technologies for the benefit of livestock farmers, entrepreneurs and consumers. CIPHET has already licensed these technologies to entrepreneurs from Maharashtra, Karnataka and Tamil Nadu. Now it has attracted an NRI entrepreneur from Ludhiana. Mr. Jessie Singh of California Farms has entered in agreement with CIPHET for establishing his own meat processing plant and products manufacturing unit at Bharowal, near Ludhiana. Mr. Srinivas Rao for Sri Laxmi Emu farms, A.P. has also signed the agreement with CIPHET for establishing emu meat plant at Kakinada. Both the entrepreneurs are trained in Livestock products Processing Lab of AS&EC Division. Further they have received the information on meat plant design, project cost, equipment and marketing strategies by Dr. Suresh K Devatkal, Senior Scientist. Under this agreement the entrepreneurs will be utilizing commercially the CIPHET's technology brand to attract the consumers. Dr R T Patil, Director CIPHET told that hygienic practices and simple marketing tools play an important role in attracting the consumers to buy the meat and meat products. Further he stressed upon the importance of low cost technologies for developing the nutritious meat products which are affordable to all classes of consumers.



**The MoU between CIPHET and entrepreneurs for licensing of meat processing technology**

Further he stressed upon the importance of low cost technologies for developing the nutritious meat products which are affordable to all classes of consumers.

## CIPHET Transfers Technology of Green Chilli Powder

Central Institute of Post Harvest Engineering and Technology (CIPHET), signed a Memorandum of Understanding (MoU) with an Indore (MP) based entrepreneur for transferring technology of green chilli powder and puree on April 29, 2010.

Notably, maturation stage of chilli into green colour is one month less as compared to chilli turning into red colour. As the production of powder/puree from green chilli is now possible with technological intervention of CIPHET, farmers would not require keeping their fields occupied for one month more



**The MoU between CIPHET and entrepreneurs for licensing of green chilli processing technology**

in wait of chillies turning into red. Similarly, green chillies powder/puree would provide more fresh and natural taste than red chillies. In some products green chilli powder would also improve presentation.

Speaking on the occasion, CIPHET Director Dr R.T Patil said that there was lot of scope in processing of green chilli into powder/puree and entrepreneurs would not be facing much problem in marketing. “Profitability in agriculture could be increased manifold, if farmers start adopting processing technologies as value addition is quite high,” he said, adding that agriculture dominated state like Punjab could be specially benefited out of adoption of processing.

Dr Deepak Raj Rai, Head of Transfer of Technology Division, said that they provide all technical help and training to interested farmers/entrepreneurs. He asked farmers to take maximum benefit of technologies developed by CIPHET. Ashok Khasgiwala, entrepreneur from Indore, said that he saw lot of profitability in production of green chilli powder. “That is why I decided to get technology from CIPHET.” Senior Scientists Dr Dilip Jain, Dr Mirdula Devi, Dr Dattatry M. Kadam and Scientist Dr V.K Bhargav were also present on the occasion.

### **CIPHET Scientist attended National Seminar on “Pomegranate Plant Nutrition, Protection & Post Harvest Management”**

National Seminar on “Pomegranate Plant Nutrition, Protection & Post harvest management” held at Sangola Dist. Solapur (MS) on 9-11 April 2010 was organized by Maharashtra Pomegranate Growers Research Association Pune. Dr. Nilesh Gaikwad Scientist TOT and Mr. Kishor Navale of Padmatech Engineering systems who had been transferred the technology of CIPHET developed pomegranate aril extractor attended the national seminar. They demonstrated the CIPHET pomegranate aril extractor to the pomegranate growing farmers. The CIPHET pomegranate aril extractor drew huge attention from the pomegranate farmers. The Director of the Pomegranate Growers Association applauded the machine and efforts of the CIPHET. The farmers asked questions mainly about packaging, storage and transportation of the extracted arils.



**CIPHET developed pomegranate aril extractor and other processing technologies being demonstrated at Sangola, Maharashtra**

## **CIPHET Scientists Provided Training on Powder Making Technology from Garlic, Ginger and Onion to Prisoners of Ludhiana Central Jail**

CIPHET has initiated unique training programme in Ludhiana Central Jail for prisoners with aim to train them to earn respectful living after they get released from the jail. As part of the training programme, on 19<sup>th</sup> April prisoners were made aware about potential of the powder making process from garlic, ginger and onion and benefits of value addition. They were told that units could be set up with minimum investment of Rupees fifty thousand and products of powder could fetch double than their production. “Very simple technology is required for powder making, while lot of demand exists in the market,” told Senior Scientist Dr Dattatreya Kadam to prisoners, adding that drying process could be carried out both in mechanical as well as in solar dryer. “While production cost of one kg onion powder is approximately Rs 100 to Rs 120. This could be sold in market for Rs 200 to 250”.



**Training-cum-live-demonstration of powdering technologies by CIPHET scientists to Jail inmates**

This kind of product is required for tertiary processing like making of soup, masala powder and pastes. He revealed that shelf life of the onion powder was more than nine months. Dr Nilesh Gaikwad (Scientist) answered queries of prisoners. Superintendent Jails Mr Kuldeep Singh said training programme initiated by the CIPHET was proving quite useful. He hoped that many of prisoners would be adopting these technologies for living a respectful life. Assistant Superintendent Jails Iqbal Singh Dhaliwal was also present on the occasion. CIPHET Director Dr R.T Patil and Transfer of Technology Head Dr Deepak Raj Rai said that they were getting good response. They revealed that complete training to interested prisoners would be provided at CIPHET after their release.

### **Institute Technology Management Unit**

#### **“Technologies Licensed To Entrepreneurs” during April 2010.**

<b>Sr. No.</b>	<b>Name of the technology</b>	<b>Contracting party</b>	<b>License fee</b>	<b>Date of commercialization</b>
1.	Green Chili Powder and Puree Processing	M/s Manglam Foods, Mr.Ashok khasgiwala, 38, Mahaver Nagar, Kanadia Road, Indore.	Rs 11,000	26.04.2010
2.	Licensing of Guava processing technology	Paramveer Singh Rai, 104-G, BRS Nagar, Ludhiana	Rs 11,000	20.04.2010
3.	Meat processing and	Mr. B.Srinivas Rao,	Rs 11,000	13.04.2010

	value addition Technologies	Sh. Laxmi Emu Farms, Kakinado(AP)		
4.	Meat processing and value addition Technologies	Mr. Jaspreet Singh Sangha, California Farms, Bhrowal Khurd, Ludhiana	Rs 11,000	12.04.2010
5.	Project profile of Guava Processing	Paramveer Singh Rai, 104-G, BRS Nagar, Ludhiana	Rs 10,000	08.04.2010
6.	Meat processing and value addition Technologies	Gursharanjit Singh Padam, White Pearls Poultry Farms, 40-F Srabha Nagar, Ludhiana	Rs 11,000	07.04.2010

#### **Advisory Consultancy Members Registered During April 2010.**

Sr. No	Name	Address	Date of Regn.
1.	NutraHelix Biotech Pvt Ltd.	#101, Park View Apartments, Mandi Village Road	20.04.2010
2	Mr. Vijya A. Lanka	Flat 4H, Tower II, City High 85, Prince Anwar Shah Road, Kolkata	24.04.2010

#### **Participation in ICAR Zonal Sports Meet**

Central Institute of Post Harvest Engineering and Technology (CIPHET) has participated in Zonal Sports Meet (Zone-IV) held at IIPR Kanpur under leadership of Dr. S. K. Nanda, Chief De-Mission for the period from 6<sup>th</sup> to 9<sup>th</sup> April 2010. 18 participants (15 Man and 3 Women) have participated in various activities such as: Volleyball smashing (Team Leader: Dr. Anil K. Dixit), Volleyball shooting (Team Leader: Mr. Pardeep), T.T., Caram, Badminton, and Athletics (throw(s) and race(s): 100 m and 200m, relay race, etc.). Mrs. Sunita Rana won 2<sup>nd</sup> prize in 200 m race (women) and Mr. Hardev Singh stood at 3<sup>rd</sup> position in 100 m race (men). Overall the participants enjoyed this tournament, and extended sincere thanks to the host institute for comfortable stay arrangement, and for providing excellent ground and other sports facilities at IIT Kanpur campus.



**CIPHET employees receiving the honors during the ICAR sports meet held at Kanpur**

## Joining

**Mr. Vijay Singh Meena** has joined at HCP Division, CIPHET, Abohar on 22.04.2010 as scientist (Hort.). He is having B.Sc.Ag. (Hons) and M.Sc. (Hons.) in Horticulture from R.A.U., Bikaner (Raj.). In his P.G. research work he has worked on “Effect of ferrous sulphate and borax on yield and quality of Ber Cv.Gola”



**Ms. Deepika Goswami** joined Food Grains and Oilseed Processing Division of CIPHET. as a scientist (Food Science & Technology) on 23<sup>rd</sup> April 2010. She is an alumnus of Jawahar Navodaya Vidyalaya, Tarikhet, Almora. She obtained her B.Sc. & M.Sc. degrees from G.B. Pant University of Agriculture & Technology, Pantnagar. Before joining CIPHET, she worked in a company Bakers Circle (I) Pvt. Ltd, Kashipur for nearly 2 years. She also did teaching in the Deptt. of Food Science & Technology, G.B. Pant University of Agri. & Technology, Pantnagar before joining ARS.



## Walk in Interview

Applications are invited for the post of Research Associates (RA) of a sub – project of National Agricultural Innovation Project (NAIP) at Central Institute of Post-Harvest Engineering and Technology, Ludhiana, Punjab. The appointment will be purely temporary under contractual and co-terminus basis, following the prescribed procedure for six months or till the completion date of the project. The appointments may be terminated at any time without notice or assigning any reason thereof.

<b>Name of the sub-project</b>	Development of Nondestructive Systems for Evaluation of Microbial and Physico-chemical Quality Parameters of Mango.
<b>Date of Completion of the project</b>	31/03/2012

### 1. Research Associates:

- i) Number of Posts
- ii) Qualifications

One

#### a) Essential

Ph.D. in Post– Harvest Engineering & Technology / Agricultural Process Engineering / Dairy & Food Engineering / Food Processing/ Food Technology /Food Engineering / Biochemical Engineering / any other discipline with thesis work on sensors, biosensors

Or

Master degree in any of the above subjects with at least 2 years of research experience as evidenced from fellowship/ associate ship/ training/ other engagements.

#### b) Desirable

		<b>Published research papers, exposure to instrumentation, sensors and biosensors.</b>
iii)	Remuneration	Rs. 18000/-+ HRA (Rs. 17000/- + HRA for Masters degree holders) per month consolidated
iv)	Age limit	40 years for Men and 45 years for Women

**2. Date and place of interview :** 08/06/2010, 10.30 AM.

**Central Institute of Post-harvest Engineering & Technology, PO: PAU, Ludhiana – 141 004, Punjab.**

**Terms and Conditions:**

- i) The above positions are purely on temporary basis and co-terminus with the project
- ii) No TA / DA will be paid for attending the interview
- iii) The applicants must bring with them original documents and a brief of research work carried out during postgraduation / Ph.D. along with one set of photocopy at the time of interview.
- iv) No objection certificate from the employer in case he / she is employed elsewhere.
- v) Experience certificate in original (if any)
- vi) All eligible candidates are requested to be present 30 minutes before scheduled time on the date of Interview for necessary formalities.
- vii) No separate interview call will be issued to candidates
- viii) Canvassing in any form will render the candidate disqualified for the post
- ix) The Director, CIPHET, Ludhiana's decision will be final and binding in all respects.

**Note :** The applications with detailed bio-data in the following proforma (1) Name of the candidate (2) Father's Name (3) Date of birth (4) Present address (5) Permanent address (6) Qualifications (7) Experience, if any (9) Publications etc. should be sent through registered post and email ([snjha\\_ciphet@yahoo.co.in](mailto:snjha_ciphet@yahoo.co.in), knarsan@yahoo.com) with passport size photograph to Dr. S. N. Jha, Consortium Principal Investigator, (CPI), NAIP & Sub - project, CIPHET, PO : PAU campus, Ludhiana – 141 004, Punjab and attend the walk-in-interview as per above schedule.

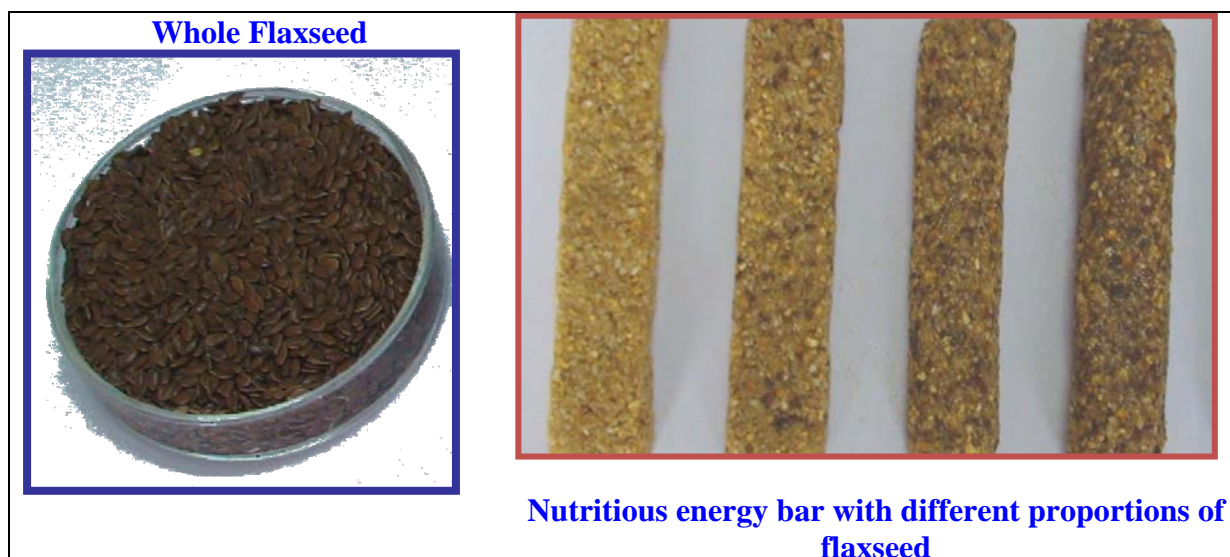
**Technology of the month**

**FLAX BASED NUTRITIOUS ENERGY BAR**

Flaxseed is emerging as one of the key sources of phytochemicals in the functional food arena. It is unique among oilseeds because of its exceptionally high content of dietary omega-3 fatty acids and lignans. Flaxseed contains 35 to 45 % oil, of which 45 to 52 % is omega-3 fatty acids. Fish oil is the traditional source of dietary omega-3 fatty acids while flaxseed oil can be used as a vegetarian source of dietary omega-3 fatty acids. In addition to being one of the richest sources of omega-3 fatty acids and lignans, flaxseed is an essential source of high quality protein and soluble fibre and has a considerable potential as a source of phenolic compounds. Flaxseed's omega-3 and lignan phyto-estrogens are in focus for their benefits for a wide range of health conditions and may possess chemo-protective properties in animals and humans. Whole flaxseed provide about 21.8% protein, 42.4 % fat, 4 % ash, 5.71

% crude fibre, 128.6 mg/100g calcium, 9.2% iron, 573.2 kcal per 100g, and 54.5 % omega-3 fatty acid.

Now days, consumers are becoming very aware about the health components in foods and also want convenience food items at affordable price with good shelf life. In today's routine, when meals are a rare occurrence in a busy schedule, an energy bar suits the need of hungry individuals who seek a hassle-free, somewhat nutritious alternative to a missed meal. Since flaxseed is an excellent source of omega-3 fatty acid, lignans, protein, dietary fibre and energy yielding nutrients i.e. fat, it can be utilized for making nutritious and functional food products such as 'Energy Bar', which is convenient and have long shelf life. At CIPHET, efforts have been made to develop Nutritious Energy Bar' from cereal, legumes, sugar ingredients, and different proportion of flaxseed. The Energy Bar prepared with 10 % ground flaxseed had moisture 13.1 %, protein 10.2 %, Fat 7.8 %, ash 1.3 %, crude dietary fibre 1.3 %, calcium 31.2 mg per 100 g, iron, 3.1mg per 100 g, calories 381 kcal/100g and omega-3 fatty acid 15.7 % of total fat. Thus 100 g of this Energy bar will provide approximately 16.7 % protein, 27.8 % fat, 7.75 % calcium, 11 % iron, 13.25 % energy as per recommended dietary allowance to a moderately active individual. The technology of making Nutritious Energy Bar with flaxseed is ready to commercialize and may be adopted successfully by self help groups and cottage level entrepreneurs.



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**For further details contact:**

Dr. R.T. Patil, Director or  
Dr. Devinder Dhingra, Information Manager  
Central Institute of Post Harvest Engineering & Technology, Ludhiana, 141004 (Pb.)  
Phone: 91-161-2308669 (O); 91-161-2305674 (Director) 9216338421 (Mobile)  
Fax: 91-161-2308670  
Email: [ciphet@sify.com](mailto:ciphet@sify.com)  
Web Page: <http://www.ciphet.in>