

# Central Institute of Post Harvest Engineering and Technology,

Ludhiana

Our Slogan: Produce, Process and Prosper



**CIPHET E – Newsletter for August 2007**

**Vol. 2 No. 8**

## Director's Column



Dear All,

Quality control is an important aspect of food processing for acceptable nutritional value and providing food safety to consumers. Several characteristics such as size, shape, density, maturity, moisture content, oil content, flavor, firmness, tenderness, color, defects, blemishes, etc., are routinely used in the quality control of agricultural and biological food products. The conventional methods are often expensive, time consuming, destructive, and hence are not suited for "on-line" quality control. The original physical and mechanical properties of the product are also destroyed during sample preparation and analysis. Hence non destructive techniques need to be developed to study the behaviour of fruits during growth and storage. Similarly biosensors are needed for detection of attack of major post-harvest spoilage/toxigenic microorganisms. The challenge for developing such technologies has been offered to CIPHET by NAIP by offering a project funding of Rs. 580 lakhs.

Another important areas in which CIPHET has been asked to work for NAIP is microencapsulation of probiotic organisms. The nutraceutical and functional foods including foods containing probiotic and prebiotics represent the largest segment of the processed foods market in developed countries and its use is expanding due to growing consumer awareness of the role of diet in health maintenance, and represents an exciting market opportunity for the Food Industries. For instance, the encapsulation of probiotics in hydrocolloid beads is helping improve their survival rate right through processing and digestion. Other new micro encapsulation methods are enabling food manufacturers to incorporate Omega 3 fatty acids in food products. The role of CIPHET in this project lead by NDRI is to design and development of microencapsulator for encapsulation of probiotic bacteria with/without incorporation of prebiotics and process optimization to increase viability and survival of probiotic bacteria and to increase encapsulation efficiency of probiotics.

CIPHET organized one day National Seminar on "Application of Engineering Principles and Mathematical Modeling in Food Processing" on 7<sup>th</sup> August 2007 and EDP programme with NITCON at CIPHET Abohar for food processing entrepreneurs from July 24 to Aug 24, 2007. Such programmes generate interest and confidence among the rural youth in setting up food processing industries. It is highly satisfying to see that with motivation and guidance from our institution someone sets up a processing unit. Mr. Rishi Rai is one such person from Abohar this month whose unit was inaugurated on Aug 24, 2007. Such rural entrepreneurs will contribute a lot for progress of rural India.

This month was full of activities along with celebration of Independence day and we all at CIPHET took the pledge that we will try to refrain from SEVEN SINS which Father of the Nation Mahatma Gandhi considered most spiritually perilous to humanity.

- Wealth without Work
- Pleasure without Conscience
- Science without Humanity
- Knowledge without Character
- Politics without Principle
- Commerce without Morality and
- Worship without Sacrifice

With best regards

R.T. Patil,  
Director

## Institute Research Council Meeting August 03 – 04, 2007

The CIPHET has organized its Institute Research Council meeting during 03 –05 August 2007 to discuss completed, ongoing and new research projects under the chairmanship of the Director. The chairman stressed that market intelligence is an important tool to assess the scope of particular technology in the market. He added that all patentable technologies should be discussed in the CIPHET Invention Disclosure form for evaluating the technology before filing patents. There were some new technologies developed under completed project like quality evaluation of apple through non-destructive technique. The Chairman said that the completed project should come out with a technical bulletin for dissemination to the end users. There were new projects in the area of fruit processing, product development, value addition, drying and coarse cereal milling. A total of 11 new projects were presented in the meeting. The progress of ongoing projects was critically reviewed. The chairman stressed that joint efforts of experts from different organizations would help to increase the success rate of the project. The institute is working jointly with NRC Seed Spices, Ajmer, ICAR Res Complex for Eastern Region, Patna, PAU, Ludhiana, PU Chandigarh, GADVASU, Ludhiana, ILRI, Ranchi etc. The house appreciated the progress made by the scientists.



Chief guest during this IRC was Dr. Fasina, Associate Prof., Auburn University, USA



The PC (PHT), Head (TOT) and scientists of CIPHET

## National Seminar on modeling and engineering applications

One day National Seminar on “**Application of Engineering Principles and Mathematical Modeling in Food Processing.**” was held at Central Institute of Post Harvest Engineering and Technology, (ICAR), Ludhiana on 7<sup>th</sup> August 2007. Delegates representing various food processing industries and Scientists from all over India participated in the seminar. Dr. H. S. Oberoi, Scientist (ASEC) & Convener of the Seminar welcomed the gathering. Dr. R. T. Patil, Director, CIPHET & Chairman of the Seminar emphasized the “Changing trends in food processing – Role of engineering principles and mathematical modeling”. He narrated the importance of applications of engineering principles & mathematical modeling of food processing and importance of association of research institute with industry in making use of new technologies for food processing. Among the new technologies he introduced were high pressure processing, ohmic heating, irradiation, micronization, microwave heating, extrusion processing, fermentation and biotechnology and explained how these processes are modeled and controlled using engineering principles and mathematical equations. Dr. Daljit Singh – Punjab University, Chandigarh the Chief Guest of the seminar, stressed upon the

importance of governing equations which were developed four decades ago and still they have relevance in mathematical modeling of all processing technologies developed even today and congratulated CIPHET for organizing such an important meeting. Dr. Oladran Fasina, Associate Professor, Auburn University, U.S.A., the guest of honour, explained engineering properties of food and biological materials and emphasized on agglomeration & compaction techniques for value added utilization crop residues. He also delivered a special lecture on approaches for mathematical modeling of processes, which are important for compaction and densification of crop residues. Other important invited lectures delivered were “Applications of fermentation & biotechnology in food processing, flow modeling of screw expeller, spectroscopy data modeling for food quality evaluation and mathematical modeling of modified atmosphere packaging of fruits and vegetables”. Poster presentation session was also organized. Dr. S. N. Jha, Senior Scientist and Organizing Secretary of the seminar proposed vote of thanks. The faculty at the level of Assistant Professors/ Associate Professors; Scientists and Senior Scientists from different Universities and Institutes located as far as Bangalore and Bapatla attended the seminar. The seminar concluded with the presentations by rapporteurs and point wise conclusions drawn from the presentations.



Inaugural session of National Seminar on Application of Mathematical modeling and Engineering properties in Food Processing



Dr. Fasina, Associate Professor, Biosystems Engineering, Auburn University, Alabama, USA being felicitated on the occasion of national seminar

### Independence day celebrations on August 15, 2007



A volleyball match between Director team and Recreation Club Presidents team at CIPHET on the occasion of Independence day



Race for children on the occasion of Independence day at CIPHET Ludhiana

## **International conference on Agri business and food industry**

With organized retail catching up and entry of major multinational food and agribusiness companies, agribusiness is undergoing radical transformations such conferences are important to develop strategies and plans for coming years. The unprecedented transformation and immense opportunities has created interest among many new players and also for expansion–geographic and capacity–of the existing businesses. In the context of the developing or emerging economies new initiatives need to be taken and debated such as reforming archaic rules and regulations governing agriculture and food sectors; dealing with multiple institutions with overlapping functions; development of efficient supply chain management systems as Indian farming system; meeting the dynamically changing tastes and preferences of the consumers due to demographic and socio- economic shifts; development of suitable agribusiness management education curriculum which adequately meets the needs of agribusiness and food industry; formulation of strategies for WTO issues etc.; development of appropriate institutional mechanisms for new and evolving concepts like Organic Farming, Contract Farming, Rural Retailing, Biofuel, Microfinance, Agriculture Risk Management etc., and many others.

The Agriculture Management Center (AMC) of Indian Institute of Management Lucknow (IIML) organized this three days International Conference on “**Agribusiness and Food Industry in Developing Countries: Opportunities and Challenges**” during August 10 – 12,2007 at Lucknow. This conference was organized in association with **Tennessee State University** and **South Carolina State University** and in a part of by project funded by **USDA** under International Science Education (ISE) program and GTZ (German Development Cooperation). There were about 28 participating institute from India and abroad. The institutes from USA and Canada represented were -

- > University of Purdue, USA.
- > Texas A&M University, USA.
- > Arizona State University, USA.
- > Algoma University, Canada.

One of the major challenges for India in the changing national and international agribusiness environment is the introduction of relevant and appropriate policy reforms. The way the agribusiness and food sector is transforming, it requires development of enabling social, political, and financial environment so that the existing market players as well as the budding entrepreneurs feel motivated enough to enter the sector. Secondly, efficient supply chain management is very crucial for any industry but it is more so in case of agribusiness and food industry as we are dealing with (1) food products and (2) these are perishable commodities. Any initiative in this direction should balance the financial profits for the company and also assure remunerative prices to the raw material producers i.e., the farmers. Most farmers in India are small and marginal with land holding less than one ha., and the welfare states like India have appropriately put in place number of institutions to avoid exploitation of the poor farmers in the hands of big businesses.

In India the bargaining power of the farmers is very low as compared to large companies and hence, the companies as a group need to follow certain norms, values and ethical business practices so as to share the value creation in the chain with the farmers. Assuring this balance, that too for a highly diverse pool of suppliers, is one of the major challenges for the agribusiness and food industry. The

agribusiness management education is not as developed in India as in many other developed countries. With the increasing numbers of companies entering this industry, demand for trained human resource – managers who not only have understanding of fundamentals of general management but also have sound and in-depth knowledge of Post Harvest Management and value addition technologies suitable to be adopted under Indian condition and that too at rural catchments.

Director CIPHET, Dr. R. T. Patil and Dr. Nawab Ali, DDG (Engg.) ICAR attended this conference. Dr. Nawab Ali brought to the attention of the house glaring contradiction of agribusiness where with soy protein from India due to lack of any processing is exported at Rs. 20/kg and due to shortage of pulses, the legume protein is imported @ Rs. 200/kg.

### **NITCON-CIPHET Entrepreneurship Development Programme (EDP) on Food Processing**

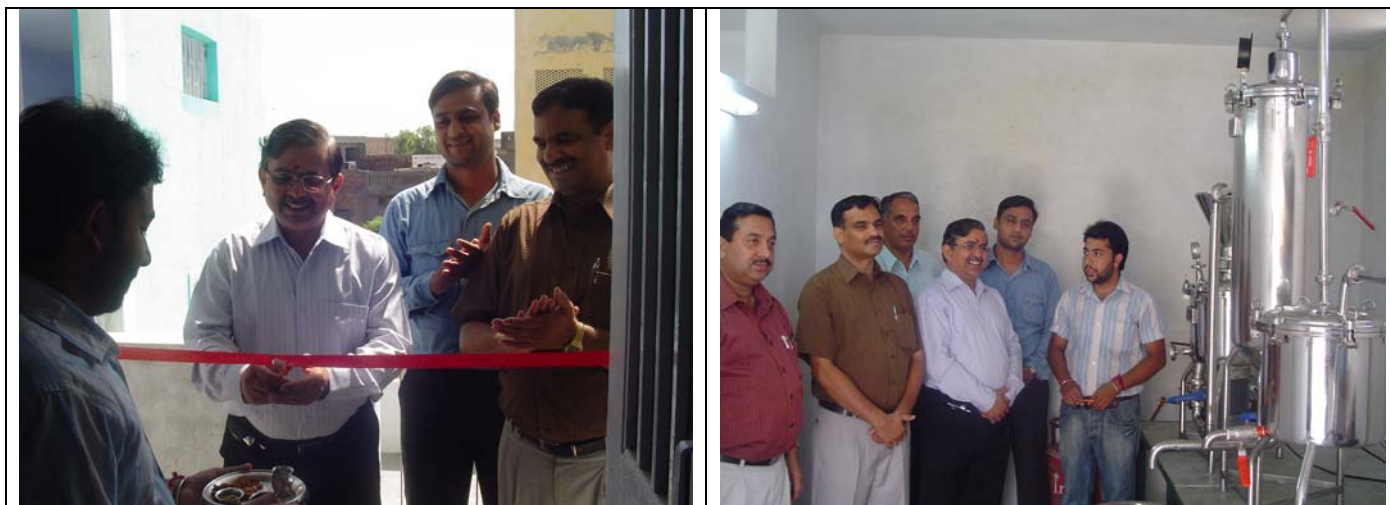
Dr. R.T. Patil, Director, CIPHET distributed the certificates to the young entrepreneurs of Punjab State on their successful completion of Entrepreneurship Development Programme for Food Processing Industries organized by NITCON in collaboration with CIPHET during 24<sup>th</sup> July to 24<sup>th</sup> August 2007 at CIPHET, Abohar. On this occasion, Mr. Vijay Arora, Senior Consultant of North India Technical Consultancy Organization Ltd (NITCON), Chandigarh was also present. Besides, Dr. R.K. Gupta, Head, Horticultural Crops Processing Division, CIPHET Abohar and Mr. Prince Gandhi, Consultant, NITCON, Chandigarh who were the coordinators of above collaborative programme also participated in the valedictory function. About 26 participants benefited by this course. Dr Patil also delivered a lecture to the participants on “Setting up of food processing enterprise based on extrusion processing”. The extruded products like *Kurkre*, *Bingo* are getting very popular in our country and selling at Rs. 500/ kg, similar to *potato chips* and *gathi seb*. The indigenously available extrusion equipment procured at CIPHET costs about 5-10 lakhs (including grinder, mixture, coating M/C etc) can produce about 25-40 kg/hr of the puffed material. The small-scale entrepreneur can take up this activity to produce puffed ready to eat product-using variety of ingredients and market this product in niche market as functional food (like food for diabetic, food with high fiber etc). The small scale processing units based on this technology have advantage over the big industries, that they can make the change in the flavor and taste of the ready to eat food based on season and the demand of the local consumers which otherwise is not possible to be done easily and frequently by big players due to large volume of production. The entrepreneurs were advised to explore the export of products of pomegranate to Canada and USA through linkage of Migrant Indian Community.



Valedictory function of Entrepreneurship development programme in food processing (R to L :Participants, Director and Mr. Vijay Arora, Sr. Consultant NITCON, Chandigarh)

### **Inauguration of Soybean Processing Industry at Abohar**

Dr. R.T. Patil, Director, CIPHET inaugurated Dab Hand Agro Foods on 24<sup>th</sup> August 2007. The unit has been established by young entrepreneur, Mr. Rishi Rai at Abohar under the technical guidance of CIPHET (Abohar) and NITCON (Chandigarh). Unit is preparing various soy products such as Soymilk, Soy cheese, Soy curd (Yogurt), defatted Soy flour and Soy bakery products. At the occasion of inauguration, officials from NITCON (Chandigarh) and CIPHET (Abohar Campus) were present. The capacity of unit is 30 litters milk per batch and has been provided with vaccum deodorizer. There is great demand of soy milk, soy paneer and flavored milk and ready to use paneer curry in Abohar. Mr. Rishi Rai, informed that he is giving the home delivery of the soy products and have planned three retail outlets for Soy Foods. He is also exploring the possibility of soy paneer and soymilk export to overseas through his personal contacts.



Inauguration of Soymilk plant at Abohar

### Visit to Cotton Classing Centre, Abohar

Dr. R.T. Patil, Director, CIPHET visited Cotton Classing Centre (Directorate of Marketing and Inspection, Ministry of Agriculture, GOI), Abohar on 24<sup>th</sup> August 2007. Mr. C.M. Girdhar, Sr. Marketing Officer briefed activities of the center to the honorable guest as well as other official from CIPHET accompanying the Director, CIPHET. On this occasion, Director CIPHET advised the officials of Cotton Classing Centre to help the cotton-growing farmers by providing quick results for their cotton samples to facilitate getting higher prices for their products in the market. Mr. Girdhar informed that they are going to train officers in proper grading of fruits for its quality and diseases freeness. The CIPHET, Abohar promised to cooperate in developing grading and inspection protocol, charts and monographs for detecting the damaged fruit.



L to R: Mr. C.M. Girdhar, Sr. Marketing Officer and Dr. R. T. Patil, Director CIPHET

## **Annual review of CIPHET activities by DDG (Engg)**

Dr. Nawab Ali, DDG (Engg.) and Dr. Pitam Chandra, ADG (PE) visited the institute on August 21, 2007 and reviewed the progress of research as well as civil work. Dr. R.T.Patil, Director, welcomed the dignitaries and presented the achievements of CIPHET in last one year including the number of projects completed, technologies developed, number of publications and patents, efforts in transferring these results through EDP programmes, the events conducted at CIPHET like national seminars, industry interface and fund utilization to the order of 99%. It was followed by presentations by heads of the divisions about the completed ongoing and new projects and network programmes being proposed by the divisions. The expert groups identified by the institute were also presented for input and approval of honorable DDG. Dr. Ali expressed his satisfaction and mentioned that institute should focus on development of technologies, which have ready market in addition to basic research component upto 15 – 20 %. Scientists should be engaged in 2-3 research projects as PI or Co – PI and not a single scientists be allowed without any project. Dr. Chandra, in his remarks mentioned that each scientist should develop his or her area of work and become expert in that field. He further added that projects under taken should be market oriented and its outcome should be transferred to end-users immediately. PCs, HODs and Section In charges also participated in the meeting and interacted with the experts. The DDG (Engg) and ADG (PE) appreciated the work done by CIPHET scientists and their efforts in transferring the technology to the end users through EDP programmes.

## **Awareness programme on Warehousing (Development and Regulation) Bill 2007**

A training cum awareness program for farmers on warehousing (Development and Regulation) Bill 2007 was organized by Central Warehousing Corporation (CWC) at CIPHET on 21-22 August 2007 in collaboration with Division of Transfer of Technology. Dr. Nawab Ali, Deputy Director General (Engineering), ICAR New Delhi inaugurated the programme. Twenty-five farmers from Punjab attended the programme. The topics such as negotiable warehouse receipt system; aims, objectives, overview and salient features of warehousing (Development and Regulation) Bill 2007; advantages of scientific storage of agricultural produce in registered warehouses; procedures involved in depositing and delivery of goods in warehouses and importance of grading of agricultural commodities for storage were covered by Drs. D. Dhingra, V.K.Bhargav and D.M. Kadam. A field visit to a local registered warehouse was organized on the second day. Scientists from CIPHET and officials of CWC interacted with the farmers and answered their queries.





Inaugural function



Valedictory function



Participants for Awareness programme on Warehousing (Development and Regulation) Bill 2007

## Second EDP on dehydration technology for food preservation and value addition

Dr. D. Dhingra and Dr. D. M. Kadam organized the Entrepreneurship Development Programme on Dehydration of fruits and vegetables for preservation and value added products during 27 August – 01 September 2007. Three participants from Mumbai attended the program. Topics such as chemical composition structure and maturity of fruits and vegetables, theory of dehydration of fruits and vegetables, principle of operation of dehydration equipment, osmotic dehydration, processing of fruits and vegetables into value added products, preparation of project profiles, F.P.O., quality evaluation of dehydrated and processed products, MAP, dehydration of ginger/ garlic/ onion, marketing of products etc along with practicals were covered.

## Technology of the month

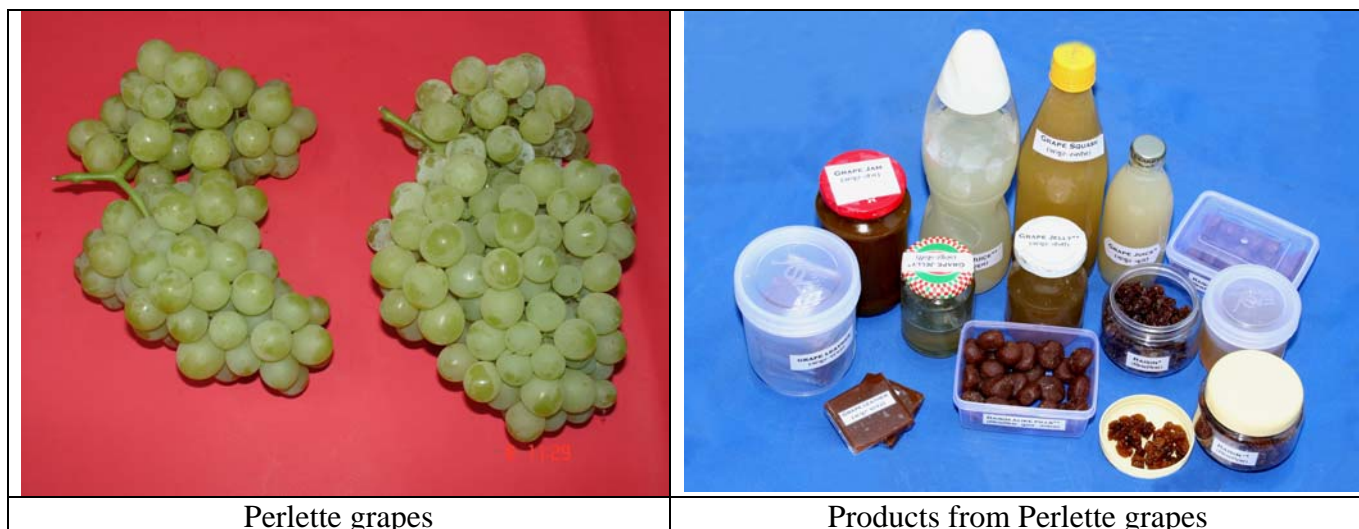
### Process Development for Production of Raisin like product/other value added products from 'Perlette' Grape

Grape (*Vitis vinifera*) cultivation is one of the remunerative farm enterprises in India. The country has the distinction of achieving the highest productivity in grapes in the world, with an average yield of 30 t/ha. Grape is grown under three distinct agro-climatic zones, namely, sub-tropical, hot tropical and mild tropical climatic regions in the country. The sub-tropical region covers the northwestern plains corresponding to 28° and 32° N latitude including Delhi; Meerut district of Uttar Pradesh; Hissar and Jind districts of Haryana; and Bhatinda and Ferozepur districts of Punjab. In this region, vines undergo dormancy during winter and bud break starts in the first week of March while the rains arrive in the first or second week of June, and therefore, only 90-95 days are available from the initiation of growth to harvest. Consequently, 'Perlette' is the only early ripening variety grown in this region under the area of 1500 ha with a production of approximately 60000 tons. Rain damage is a problem with Thompson Seedless and other variety in this region.

In Punjab, Bathinda & Ferozepur districts are the leading grape-growing region. The state government had imported cuttings of early maturing variety "Perlette" from California (US) during sixties. This variety acclimatized well and proved good. The area under cultivation is now more than 1200 ha in Bathinda, Mansa and Ferozepur; and Perlette is the major variety. The Perlette variety has a niche market, as no other variety is available from mid-April to June. But growers and pre-harvest contractors have to face many problems on the marketing front. Since the shelf life of Perlette variety is less, it cannot be marketed in markets more than 10-12 hours away journey. Proper marketing facilities, cooling centers for storage and processing technologies are not available. There is an imperative need to reduce the post-harvest losses that are presently estimated to be 39% of the production and 30% of the value. Processing of grapes is not done in Punjab. Earlier it was suggested that Perlette variety is only suitable for making white wine and vermouth. There is a need to diversify the uses of Perlette grapes. Raisin is a most acceptable processed product from the grape. Raisins are dried grapes. Technically, a grape becomes a raisin when, during the drying process, its sugar content drops below 16 percent.

Grapes should have a high sugar content (TSS) of 20-24°Brix for producing quality raisins. It is experimented several times to produce the quality raisin from the 'Perlette' variety of grape, but it could not produce a marketable quality even by giving various pretreatments because of the low TSS (14-17°Brix), non-disappearance of seed during the ripening process and comparatively thick skin. However, this particular variety of grape can be successfully processed into the following products:

Raisin like pills can be prepared by using the pulp of the grape with some additives as a test mix; which emerged as a promising and acceptable quality. Non-alcoholic grape juice can be extracted from this grape by steam processing under pressure and a quality juice prepared in pure and fifty percent strength. Jam, Jelly and Squash can also be prepared from Perlette grapes. Jam and Squash are prepared by using the finished pulp of the grape whereas Jelly is prepared by pure juice extracted during the hot processing. The jelly prepared from this grape was of excellent quality with translucent light yellow in colour and with a good finish. In a single line processing of Perlette grape, juice is extracted by hot processing and pulps are prepared by using the remaining mass of the grape.



Perlette grapes

Products from Perlette grapes

## Sponsored projects approved for CIPHET during this month

### *NAIP project on Development of nondestructive systems for evaluation of microbial and physico-chemical quality parameters of mango and apple*

The institute was considered for award of NAIP project on Development of nondestructive systems for evaluation of microbial and physico-chemical quality parameters of mango and apple. The scientists associated with this project are **Dr. S.N. Jha**, Senior Scientist as Lead Centre PI, **Dr. K. Narsaiah**, Senior Scientist, **Dr. Ramesh Kumar**, Scientist are Lead centre CO-PI. – CCPI. The cooperating centers are CIAE, Bhopal (**Dr. N. Kotwaliwale**, Senior Scientist), IARI new Delhi (**Dr. Abhijit Kar**, Scientist (SS) and **Dr. D.V.K. Samuel**, Prof. & Head), and IMTECH, Chandigarh (**Dr. C. Raman Suri**, Scientist E II). The proposed cost of the project is Rs 580 Lakhs.

### *NAIP on potato processing*

The concept note “Value chain on potato and potato products” submitted by Central Potato Research Institute under component 2 has been accepted. CIPHET has been accepted as partner in this project. The activity approved for CIPHET is “Develop technologies for utilizing the industrial wastes and the waste potatoes for animal feed”. A detailed proposal on the above topic has been prepared and submitted. The stakeholders workshop is scheduled on 3-4 October 2007.

### *Consultancy for NAIP project on Livelihood Improvement and Empowerment of Rural Poor*

Dr. D. Dhingra, Senior Scientist, CIPHET, Ludhiana, has been approved as a consultant in the NAIP project “Livelihood Improvement and Empowerment of Rural Poor through sustainable farming systems in North East India”, under component 3. The area of consultancy is post - harvest engineering & equipments and value addition of farm/forest produce.

### ***NAIP Project on Process Development for Whey based Nutraceuticals***

**NAIP Project on** Process Development for Whey based Nutraceuticals viz., Lactoperoxidase, Lactoferrin, Glycomacropeptide, Galactooligosaccharides and Milk based Functional Foods viz., Ice-cream, Nutrition Bar & dry Mix, Ghee, Cheese and Shrikhand has been approved for NDRI. The CIPHET, Ludhiana is one of the consortium partners in the above project with National Dairy Research Institute, Karnal as the lead Consortium institution. Dr. K. Narsaiah, Senior Scientist is a cooperating PI from CIPHET and approximate budget for CIPHET is Rs. 138 lakhs. CIPHET will be designing and developing microencapsulator for encapsulation of probiotic bacteria.

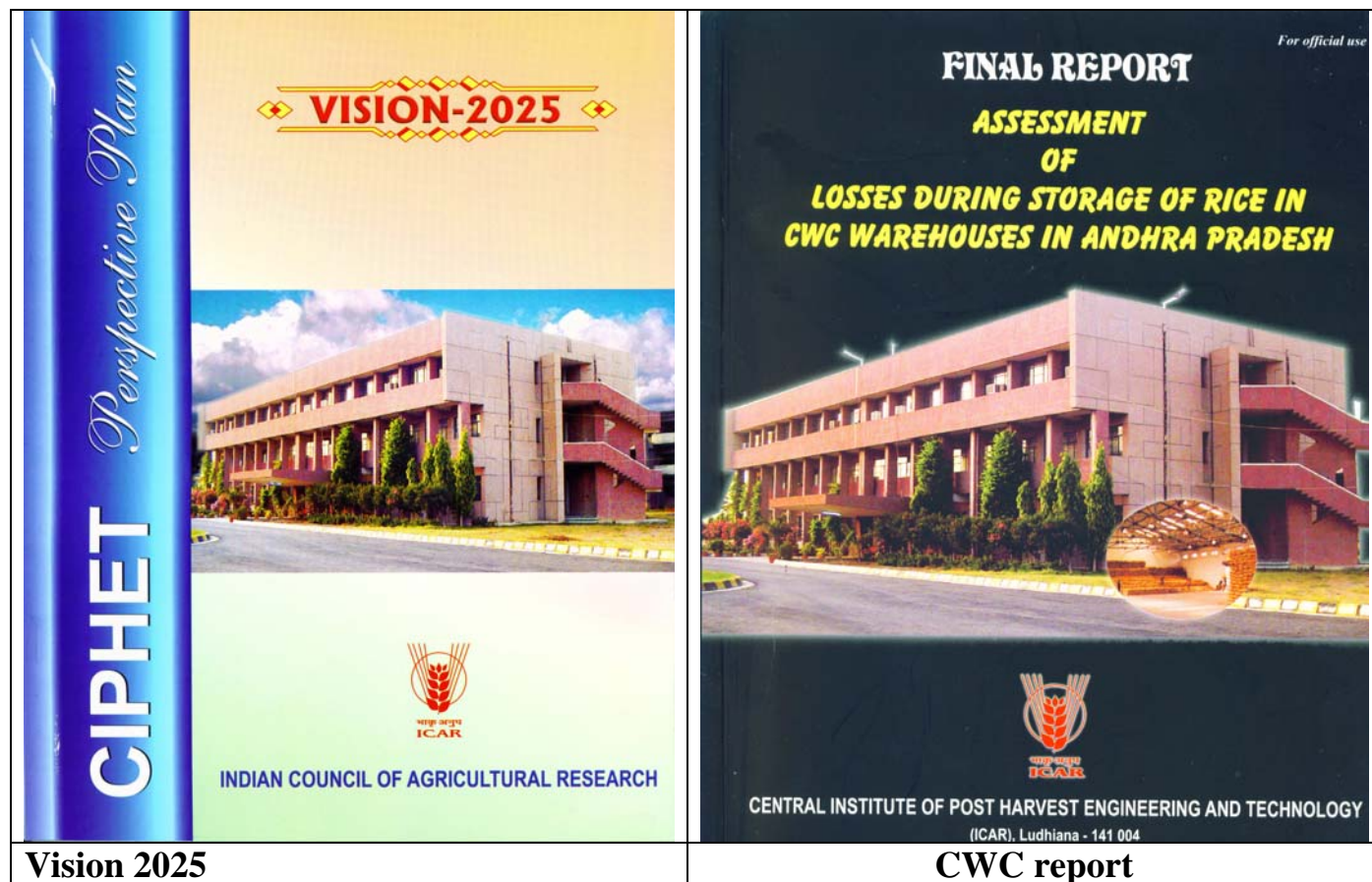
### **Transfers**

Dr. Meena MS, Scientists (Extension) got selected to the position of Sr. Scientist at ICAR Research Complex for Eastern Region, Patna, Er. ARP Kingsly, Scientist resigned from CIPHET for PhD studies and better prospects in USA and Dr. Satyavir Singh, Scientists (Chemical Engineering) was selected as reader in Chemical engineering at BHU IT, we wish them all the best in their future endeavors.

### **Promotions**

Similarly Dr. R.R. Sharma was promoted from Scientist (SS) to Sr. Scientist, Er. Sangeeta Chopra from Scientist to Scientist (SG), Er. S.K. Aleksha Kudos from Scientist to Scientist (SS) and Dr. VK Bhargav from Scientist to Scientist (SS). We congratulate all of them and wish them good luck in their new positions

## Publications of the Month



© *CIPHET reserves all rights to information contained in this publication, which cannot be copied or reprinted by any means without express permission.*

### For further details contact:

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