



Central Institute of Post Harvest Engineering & Technology Ludhiana

OUR SLOGAN: PRODUCE, PROCESS AND PROSPER

**CIPHET E – Newsletter for January, 2010
Vol. 5 No. 1**

Director's Column



Dear All,

The CIPHET in association with Ludhiana Central Jail started a unique training program in food processing for prisoners on Jan 6, 2009. The aim of the program was to enable inmates to earn respectful livelihood after they complete their sentence. CIPHET developed technologies for food processing can help jail inmates in setting up their own commercially viable units. This training program was aimed at creating awareness among them.

Time has come that we need to have constant interaction among the stake holder to develop an effective and suitable technology. Due to the initiative of our honorable DG and also DDG (Engg) the engineering division of ICAR has initiated series of meeting with Horticultural, Farming system research, Animal Science and Fishery scientists. One such interaction meet was held at CIAE Bhopal which identified important researchable issues in Aquaculture/ inland fisheries, Livestock housing, Livestock feed and material handling, Processing and value addition of fisheries and animal products and residue and by product utilization.

An event of Annual Convention of Indian Society of Agricultural Engineers was a grand one due to Golden Jubilee Year of the society. The theme for the National Symposium was on Engineering Interventions for Food Security. About 400 Agricultural Engineers from all over India participated in this convention and symposium.

As usual Bihar is leading state in sending their SHG leaders for training on 'Post-Harvest Technology for Rural Catchments'. Thirty eight farmers from ATMA BAMETI Lakhisarai and ATMA BAMETI Bhojpur attended the training.

To accelerate the progress of food processing activity it is important that our bankers should be sensitized to the scope of potential of post harvest technology as enterprise. The NABARD came forward in this effort and senior level NABARD officers participated in tailor made programme on Post Harvest Management and Value Addition of Horticulture and Plantation Crops during 04-08 January 2010 at CIPHET, Ludhiana/Abohar.

Now CIPHET has initiated a new process of technology transfer as substitute to EDP programme to address the enthusiasm of the upcoming entrepreneurs. The technology is generally licensed at Rs. 11000.00 per party which includes practical training on processing, literature and project profile etc.

The technology flashed this month is for Small Scale Production of Therapeutic Biscuits. Carrot and beetroot are two important root vegetables which are of great importance as for health of the consumer is concerned and by using CIPHET developed formulations these nutritious biscuits can be produced to meet the demand of high end consumers for specialty biscuits.

With best regards

R.T. Patil

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New initiative: CIPHET starts training program for prisoners in central jail

The CIPHET in association with Ludhiana Central Jail started a unique training program in food processing for prisoners on Jan 6, 2009. The aim of the program was to enable inmates to earn respectful livelihood after they complete their sentence. CIPHET has developed number of technologies in food processing which could help jail inmates in setting up their own commercially viable units. This training program was aimed at creating awareness among them. On this occasion practical demonstration was given for making milk from groundnuts. The training program in food processing would go throughout the year and prisoners would be made aware about various technologies. The prisoners took keen interest in technologies and asked related questions to scientists. The training program would include technologies of processing of groundnut milk and curd, tomato puree manufacturing, ginger and onion powder production, preservation of fruits and vegetables through dehydration, modern 'dal' milling technology, modified atmosphere packaging, manufacturing of green chilli powder, processing aonla, guava and meat etc

After CIPHET inaugurated training programme for inmates in Ludhiana Central Jail on Jan 6, jail authorities are now thinking to start production of some of the processed food in the beginning at least for consumption of inmates. "We have more than 2500 prisoners/undertrials in the jail and they themselves have lot of requirement of processed food. If this training program initiated by CIPHET got successful, we may set up plant for soyabean/groundnut milk production in jail campus itself" said, Jail Superintendent Mr. Kuldeep Singh, adding that they could also open outlet outside jail for relatives/acquaintances of jail inmates.

Calling it a good initiative, Mr. Kuldeep Singh said that so far training to prisoners were confined to tent making, handlooms, welding activities etc and food processing could add another dimension. Assistant Superintendent of Jail Mr. Iqbal Singh Dhaliwal said that jail inmates could earn respectful income, if they were able to get proper training in food processing. He said after seeing the response of inmates in coming months they could moot proposal of setting up food processing plant in jail to the state government.



Demonstration of Groundnut milk preparation and its value added products to jail inmates

On the occasion, Bachittar Singh, farmer-turned entrepreneur, revealed jail inmates about his successful journey in production of soyabean processed food. He encouraged them to set up similar plants. If food processing plants were set up in jail premises not only would they help in income generation but also skill development of inmates.

Interaction meeting of the scientists of Engineering, Animal Science and Fishery Divisions at CIAE, Bhopal.

An interaction meet of ICAR subject matter scientists from Institutes of Animal Sciences and Fisheries was organized at the initiative of Central Institute of Agricultural Engineering (CIAE), Bhopal during January 11-12, 2010 at CIAE. A total of 18 Scientists representing 12 ICAR Institutes participated in the meeting. On first day, the meeting was held under the Chairmanship of Dr. MM Pandey, Deputy Director General (Engineering). The other dignitaries who attended the meeting include Dr. SC Dubey, Joint Director, HSADL, Bhopal; Dr SD Kulkarni, Project Director (SPU); Dr Surendra Singh, PC, AICRP on FIM and Dr Deepak Choudhary, PC, AICRP on UAE. From CIPHET, Dr RT Patil, Director, and Dr SK Nanda, PC, AICRP on PHT attended this meeting. The meeting was also attended by 40 scientists of CIAE.

DDG (Engg.) emphasized the need for expanding the research activities of agricultural engineering in other domains of agriculture. On the first day, presentations were made by the identified speakers on the issues related to:

- Aquaculture/ inland fisheries by Dr AK Verma, CIFE Mumbai
- Livestock housing by Dr RP Misra, CIRG Mathura
- Livestock feed and material handling by Er PP Ambalkar, CIAE Bhopal
- Processing and value addition of fisheries and animal products by Dr MR Raghunath, CIFA Regional Centre, Bangalore
- Residue and by production utilization by Dr PN Joshi, CIFT Cochin

Based on the presentations and the interactions, many important R & D activities were identified for collaborative projects.

Presentations of Engineering SMD Directors for Hon DG ICAR

All Directors and Project Coordinators of Engineering division of ICAR presented the progress to Hon'ble Secretary, DARE and Director General, ICAR at New Delhi on January 15, 2010. The issues emerged from this meeting related to CIPHET were as follows:

1. CIPHET needs to develop a total scenario of R&D needs for different crops and commodities and identify the organizations, which have to take up different activities. The CIPHET has to play a lead role in core technology generation, customization of technology and providing policy interventions in the area of food processing. The priority areas for CIPHET should be primary and secondary processing of agricultural produce in production catchments, micro level processing and food safety.
2. CIPHET should organize a meeting either at Delhi or at Ludhiana involving AICRP on PHT, CIAE, NDRI, CIFT, NRC on Meat and other institutions to develop the future scenario of post-harvest technology in the country and the collaborative activities to be taken by the CIPHET and other organizations. Separate meetings with four referral laboratories and CFRTI, Mysore are also required to be organized.
3. It was decided that significant technologies coming out from different centers of AICRP on PHT, should be identified and commercialized. The existing referral laboratories should be strengthened and new ones should be established based on the requirements.
4. The application of nano technology for use of plastics in agricultural sector should be explored in AICRP on PHT. The project should collaborate with organizations like M/s. Jain Irrigation. Jalgaon.
5. The AICRPs should organize separate expert group meetings for their projects to identify the thrust areas, which should be pursued.
6. The Institute should organize at least two meetings each of IRC, RAC and IMC every year. The IRC meeting should be followed with RAC meeting.

44th Annual Convention of Indian Society of Agricultural Engineers



The 44th Annual Convention and Symposium of **Indian Society of Agricultural Engineers** was organized in its Golden Jubilee Year during 28 – 30 January, 2010 at Indian Agricultural Research Institute (IARI), New Delhi. Taking into view the vital role of Agricultural Engineers in production and post harvest management of farm produce, the theme for the National Symposium was on **Engineering Interventions for Food Security**. The sustainable development of agriculture depends heavily on engineering interventions. Today, more than ever, engineering is needed as one of the potent weapons in the fight for ensuring food security for all and also protect the environment. About 400 Agricultural Engineers from all over India participated in this convention and symposium. On this

occasion, ISAE awarded several medals and certificates to recognize outstanding achievements of its members. From the **Central Institute of Post Harvest Engineering and Technology** (CIPHET), Ludhiana, thirteen scientists participated in this jubilee convention and national symposium to present their research work.

Training on ‘Post-Harvest Technology for Rural Catchments’ for Bihar Farmers

Two training programmes were conducted at CIPHET, Ludhiana on ‘Post-Harvest Technology for Rural Catchments’ for 17 and 21 farmers from Bihar during 12-18 January, 2010 and 19-25 January, 2010 and sponsored by ATMA BAMEITI Lakhisarai and ATMA BAMEITI Bhojpur respectively. The training was coordinated by Dr. Sangeeta Chopra, Senior Scientist. The participants were farmers from the villages in the district of Lakhisarai & Bhojpur and are engaged in growing wheat, paddy, mushrooms and potatoes. The training was given on processing of grains, pulses, oilseeds, fruits and vegetables including processing of soybean, aonla and guava through lectures and practicals. The know-how on minimal processing, packaging and storage of vegetables and cultivation of mushroom and vegetables was also disseminated.



Participants from ATMA BAMEITI Lakhisarai

Senior Level NABARD Officer’s Training at CIPHET

Senior level NABARD officers participated in tailor made programme on Post Harvest Management and Value Addition of Horticulture and Plantation Crops during 04-08 January 2010 at CIPHET, Ludhiana/Abohar. The Inauguration of the above programme was organized on 4th January 2010 at CIPHET, Ludhiana. Dr. R.T. Patil, Director was the Chairman and Er. R.C. Chopra, Director, MSME Development Institute, Ludhiana was the Chief Guest. Nine participants from different offices of NABARD located at different States of the country attended the programme. During their stay at Ludhiana, delegates visited PAMETI, PPHTC, PAU, and B.K. Soya Agro Products and discussed the various issues of post production management of food crops and technology dissemination techniques to the end users. Further, officers also visited Field Fresh Foods (P), Ltd, Ludhiana and seen the Pack House facility of the organization. During their training at Abohar, delegates visited

Kinnow Grading and Waxing Plants, Super Fine Agro-Industries (Guar Gum Plant), Hi Tech Nursery, Punjab Agro Juices Limited, Abohar, Zamindara Farm Solutions (P), Ltd., Fazilka and other food processing industries. Besides, exposure to relevant post harvest and processing technologies for loss reduction and value addition of horticultural commodities, machinery involved and its availability, project profile which consisting of technical and financial parameters for formulation, appraisal and monitoring of projects, parameters for selection of machinery and suppliers, product and process management, industry norms, market research and analysis for entrepreneurship development, etc. was also given to the officers though lectures and other field visits as a part of their capacity building programme in the area of post harvest management of Horticulture and Plantation Crops.



NABARD Officers visiting operation of Farmers First Agro Processing Unit at Mauzgarh



Participants with CIPHET, Abohar Faculty

NITCON Trainees visited CIPHET, Abohar

About 20 women participants attending Entrepreneurship Development Programme entitled Opportunities for potential Science and Technology Background Women (To become self employee Entrepreneur) visited CIPHET, Abohar on 20th January 2010. This EDP is exclusively being organized by NITCON at Muktsar for the women having Science and Technology background on behalf of Ministry of Science and Technology, GoI, New Delhi. During their visit to CIPHET, Abohar, Dr. R. K. Gupta, Head, HCP Division presented showcase of CIPHET Technologies and participants have also been shown the research facilities, pilot plants etc.



Shrink wrapping Machine is explained to the trainees

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Technologies Licensed to Entrepreneurs during January 2010.

In the month of January total five entrepreneurs approached the institute for the licensing of different technologies. ITMU has transferred the following technologies.

1. Preparation of cereal based extruded products

Snack foods now comprise an important part of the daily nutrient and calorie intake of many consumers. Expanded products like snacks and breakfast cereals are very popular today because of their crunchy texture, which arises from the honeycomb structure imparted to the material during extrusion. At CIPHET, an extrusion facility with range of extruders has been established. In particular, a collet extruder of small capacity (25-35 kg/h) shows a very promising feature for the production of low cost protein enriched ready-to-eat expanded snacks. This food extrusion facility costs about Rs. 2.0 Lakhs. The small and cottage level entrepreneur for the production of Ready-To-Eat snacks and similar products can easily adopt this. This production is highly profitable (about Rs. 14/kg of product). This technology facilitates use of low cost rice and wheat brokens to be converted into high value ready to eat snack foods at rural catchments. At CIPHET, Ludhiana, Dr. S.Balasubramanian, Sr.Scientist offer one-week training program for upcoming entrepreneurs on this technology for establishing rural enterprises. This month Mr. Manish Chawla of Ludhiana approached the Institute to get training.

2. Preparation of groundnut milk

The scarcity in milk supply in developing countries has led to efforts towards the development of alternative milks. Groundnut and soybean are two major raw material used for preparation of imitation milks.

Groundnut has a potential role to play in combating malnutrition, It contains on an average 40.1 per cent fat and 25.3 per cent protein and is a rich source of calcium, iron and vitamin B complex like thiamine, riboflavin, niacin and vitamin A. Preparation of peanut extract (milk like product) and its utilization in the development of dairy analogues such as flavored beverage, curd, yoghurt, *Lassi* and *paneer* may be one such area of utilization. A commercially viable process for the inactivation of lipooxygenase enzyme in the peanuts before processing was developed. This coupled with use of modern airless grinding and de-odourising technique has led to preparation of peanut milk, which has negligible nutty flavour. Peanut milk prepared, highly acceptable chocolate / vanilla flavored beverages have been developed with about 12% total solids and 3.25% protein. Many entrepreneurs have taken the license of this technology from the Institute and recently in this month Dr. D.N.Yadav trained Mr. Kulvinder Singh of Jalandhar and Mr. Amarjeet Singh of Bathinda for production of Groundnut milk.

3. Bee breeding and keeping

Honey is a sweet and viscous fluid produced by honeybees and is derived from the nectar of flowers. Honey is significantly sweeter than table sugar and has attractive chemical properties for baking. The business of bee keeping requires quality queen bees to continue the colonies of honeybees so as to produce good quality honey.

The last decade has witnessed a huge leap in apiculture in India especially in Punjab and adjoining states of Rajasthan, UP., J & K, H.P., Haryana and Uttaranchal. Natural process of

queen building is time taking. Hence there is a need for artificial bee breeders to help fast propagation and success in apiculture. These days beekeepers rear the honeybees in bee boxes for production of honey. This has become a commercial enterprise. The project also has the inherent strength of collecting honey and bee's wax in the process, which adds to its profitability. A complete Project profile of Bee keeping and breeding was prepared by ITMU and provided to Mr. Jaswant singh of Ludhiana and Mr. Baldev singh of Ludhiana to help them establishing this business at their catchment area. The initial investment for this business is likely to be 4-5 lakhs and the calculated pay back period is 3 years, with net profit of 3-5 lakhs per year.

Farewell to Dr. S.K.Tandon, ADG (Engg)

A farewell function was organized for Dr.S.K.Tandon, ADG (Engg.) on the occasion of his superannuation from the service on 16 January, 2010 at CIPHET, Ludhiana. Dr.M.M.Pandey, DDG (Engg.), Dr.V.M. Mayande, VC, Dr. PDKV, Akola (MS) Dr. N.C. Patel, VC, Junagadh Agricultural University, Junagadh, Dr. Pitam Chandra, Director, CIAE, Bhopal, Dr.R.T.Patil, Director, CIPHET, Ludhiana graced the occasion. During the function, all speakers highlighted the commendable contribution of Dr.S.K.Tandon in the development of Agricultural Engineering Discipline in ICAR. Dr.S.K.Tandon was honoured with memento during the farewell ceremony.



Felicitaton of Dr. SK Tandon, Retiring ADG (Engg.) at CIPHET Ludhiana



Dr. SK Tandon, Dr. Pandey, Dr. Chandra, Dr. Mayande and Dr. NC Patel with staff of CIPHET

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नववर्ष के शुभ अवसर पर स्टाफ मनोरंजन क्लब ने एक समारोह आयोजित किया। डा. आर. टी. पाटिल, निदेशक सीफेट, लुधियाना ने इसकी अध्यक्षता की। डा. के. के. सिंह, विभागाध्यक्ष (एफ.जी.ओ. पी) एवं क्लब के अध्यक्ष ने इस अवसर पर सभी सदस्यों को नववर्ष की हार्दिक बधाई दी एवं प्रगति की कामना की। डा. आर. टी. पाटिल ने अपने संबोधन में क्लब के सदस्यों को बधाई दी। उन्होंने सभी सदस्यों से इस अवसर पर एक संकल्प लेने को प्रेरित किया जो प्रत्येक सदस्य अपने दैनिक कर्तव्यों के अतिरिक्त संस्थान के उत्थान के लिए इस वर्ष करें। क्लब के सदस्यों ने कुछ सांस्कृतिक कार्यक्रम भी पेश किये।

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कर्मचारी मनोरंजन क्लब के तत्वाधान द्वारा संस्थान में 61वें गणतंत्र दिवस समारोह का आयोजन किया गया। निदेशक, सीफेट, लुधियाना ने ध्वजारोहण किया। राष्ट्रगान के उपरान्त अपने उद्बोधन में निदेशक ने संस्थान की गत वर्ष की उपलब्धियों का विवरण दिया। उन्होंने सीफेट के भविष्य के कार्यक्रमों के बारे में अवगत कराया एवं संस्थान की उन्नति की कामना की। इसके उपरान्त कर्मचारी एवं बच्चों की खेलकूद प्रतियोगिताएं आयोजित की गयीं।

इसके उपरान्त क्लब ने सांस्कृतिक कार्यक्रम का आयोजन किया। इसमें क्लब के सदस्यों, उनके परिवारजनों एवं बच्चों ने मनमोहक सांस्कृतिक कार्यक्रम प्रस्तुत किये। इस कार्यक्रम को निदेशक सीफेट, क्लब के अध्यक्ष एवं अन्य सदस्यों ने बहुत सराहा।

कार्यक्रम के अन्त में खेलकूद प्रतियोगिताओं के विजेताओं एवं उपविजेताओं को डा. आर. टी. पाटिल, निदेशक, सीफेट, लुधियाना, एवं श्रीमति पाटिल ने पुरस्कार वितरण किया।



Awards and Recognitions:

ISAE recognizes CIPHET scientists



On the occasion of 44th Annual Convention and Symposium of **Indian Society of Agricultural Engineers** organised in its Golden Jubilee Year during 28 – 30 January 2010 at Indian Agricultural Research Institute (IARI), New Delhi, ISAE awarded several medals and certificates to recognize outstanding achievements of its members. From the **Central Institute of Post Harvest Engineering and Technology (CIPHET)**, Ludhiana, thirteen scientists participated in this jubilee convention and national symposium to present their research work. **Dr. R. T. Patil**, Director as well as **Dr. S.K. Nanda**, Project Coordinator (PHT) from CIPHET, Ludhiana were conferred with **ISAE Fellow** for their significant contributions during the last two decades in the field of Agricultural Engineering. **Dr. S. N. Jha**, Principal Scientist from CIPHET, Ludhiana also received **Commendation Medal** for his outstanding contribution in the field of Agricultural Structures and Process Engineering.



Director CIPHET appointed as Chairman BIS committee FAD 16

Dr. RT Patil, Director CIPHET has been appointed as Chairman of FAD 16 of Bureau of Indian Standards for Food grains and Starches. The scope of this committee is A) Develop standards for processed nutritious food, snack foods, edible oilseed flour, protein isolates, bakery and confectionery products, their raw material, equipments and related items B) Develop terminology as well as method of tests and storage of food grains for all aspects of food grain products and starches, C) Develop methods of test for processed food products including chemical, microbiological and sensory evaluation and D) develop liaison with i) ISO/TC 34/SC 4 Cereals and pulses; and ii) ISO/TC 93 Starches (including by-products)

Promotions

Dr. S.K. Tyagi, Sr. Scientist promoted to the post of Pr. Scientist at CIPHET, Ludhiana w.e.f. 22.01.2010

Dr. Goutam Mandal, Scientist (SS) of CIPHET, Ludhiana promoted to the post of Sr. Scientist at NRC for Oil Palm, Pedavegi, A.P.

Technology of the Month

Small Scale Production of Therapeutic Biscuits

Biscuits are convenient and one of the most popular and widely consumed processed food products in our country by all age groups and at all the times. The total market of biscuits in India had been estimated about 1.1 million ton annually. As they are convenient, economical, hygienically safe and are ready to eat form, their use is considered as a means of nutritional supplementation for a large number of consumers. Biscuits are generally prepared from refined wheat flour, as the main ingredient, which provide fewer amounts of dietary fibre and imbalance proteins. The quality of protein can be enhanced by fortifying locally available protein rich foods like soybean. Value addition of biscuits can also be done using the fruits and vegetables rich in vitamins, minerals and also in antioxidants.

Carrot and beetroot are two important root vegetables which are of great importance as for health of the consumer is concerned. Carrot, being extremely rich in β -carotene (pre-cursor of vitamin A) content, it can be a good source of enhancing the daily β -carotene intake. As poor nutrition is one of the major contributory factor in the development of vitamin A deficiency in children, β -carotene rich defatted soy fortified biscuits can help in improving the vitamin A status of the consumers and can be considered as one of the good food for distributing as supplementary food to the children through developmental agencies.

Beetroot, a nutritious root vegetable, has long been considered beneficial to the blood, heart, and digestive system. More recently, it has been advocated as a cancer preventive and as a means of bolstering the immune system. Besides being rich in sugars, vitamins and minerals, beetroot is rich in Betaine (betacyanin). Studies showed that betaine supplements played a role in lowering potentially toxic levels of homocysteine, a naturally occurring amino acid that can be harmful to blood vessels thereby contributing to the development of heart disease, stroke, and peripheral vascular disease. Studies also revealed the presence of specific anti-carcinogens in beetroot which are bound to the red colouring matter of beetroot that supposedly helps fight against cancer. It also increases the uptake of oxygen in anemic subjects. Beetroot is generally consumed in the form of salad or juice by adults but least liked by children due to its bitter taste. If it is added in the processed products like biscuits, its consumption can be increased significantly.

At CIPHET, studies have been conducted to develop dried beetroot supplemented defatted soy fortified biscuits and dried carrot supplemented defatted soy fortified biscuits. These both types of biscuits have got very good sensory acceptability.

Dried beetroot supplemented defatted soy fortified (5% in flour formulation) biscuits, developed at CIPHET have got very good sensory acceptability at 6% levels (flour formulation basis) of beetroot. These biscuits provide approximately 8.25% protein, 0.9% dietary fibre and 483 Kcal / 100 g.

Dried carrot supplemented defatted soy fortified (5% in flour formulation) biscuits, prepared from flour formulation containing 7.5% dried carrot were very much liked on sensory evaluation and will also be helpful in providing daily dietary requirement of β -carotene to the consumers at 100 g consumption level of these carotene rich biscuits.



Dried beetroot supplemented (0 to 10%) defatted soy fortified biscuits



Dried carrot supplemented (0 to 10%) defatted soy fortified biscuits

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