Central Institute of Post Harvest Engineering and Technology, Ludhiana
Our Slogan: Produce, Process and Prosper

CIPHET E – Newsletter for October, 2008
Vol. 3 No. 10

Director's Column

Dear All,

Women play a key role in agriculture though it has never been recognized fully. Women constitute 40% of the agricultural workforce and this percentage is rising. Today, 53% of all male workers, but 75% of all female workers and 85% of all rural female workers are in agriculture. Women work extensively in production of major grains and millets, in land preparation, seed selection and seedling production, sowing, applying manure, fertilizer and pesticide, weeding, transplanting, threshing, winnowing and harvesting.

The role woman in processing and value addition of the locally grown crops is more important than production agriculture. The women are involved in processing of milk into butter and butter oil, preparing the pickle, papads and legume badies for use through out the year, the women are also responsible for safe storage of grain in the houses as well as storage of onion, garlic and chillies which are stocked in the production season and are properly dried and stirred in between for their safe storage. Traditionally also women were involved even in dal milling, rice milling and flour milling activities for the households. Due to their experience in sourcing food for their families and their safe storage they have natural instinct for food quality and safety. Hence there is a potential in upgrading their skills in food processing so that they can operate and manage scaled up operation of food processing and augment to the family income. To explore this possibility by active collaboration between CIPHET and NRCWA, I visited NRCWA so that CIPHET developed technologies could be adopted for setting up women owned and operated micro and small scale food processing enterprises.

The technology which is flashed this month from CIPHET is minimal processing of arils from pomegranate for domestic market. The pomegranate is consumed mainly fresh, but the difficulty presented for peeling the fruit, has limited its consumption. The commercialization of fresh arils minimally processed and "ready-to-eat", could be a good alternative. The total package of technology has been developed to extend shelf life of the minimally processed pomegranate arils for 16 days.

This month has been very fruitful to the CIPHET as we got two DST funded projects with funding to the tune of about Rs 60 lakhs. We got ICAR approval for two winter schools so that human resource can be developed in the advanced processing techniques to produce designer foods as well as edible colors and flavours.

With best regards

R.T. Patil,
Director

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हिन्दी पखवाड़े का समापन

विगत वर्षों की भांति इस वर्ष भी संस्थान के लुधियाना एवं अबोहर परिसर में हिन्दी पखवाड़े का आयोजन 14 से 28 सितम्बर, 2008 तक किया गया। हिन्दी पखवाड़े के दौरान कम्पयूटर से हिन्दी टंकण, तत्काल भाषण, हिन्दी अनुवाद, एक दिवसीय पोस्टर पत्र प्रदर्शन, वाद विवाद, प्रार्थना पत्र, विज्ञानिक संगोष्ठी, निबन्ध लेखन, टिप्पण लेखन एवं हिन्दी में अधिक कार्य करने की प्रतियोगिता का आयोजन किया गया, संस्थान के अधिकारियों एवं कर्मचारियों ने हिन्दी भाषा के प्रति अपना उत्साह दिखाते हुए इन प्रतियोगिताओं में बढ़चढ़ कर भाग लिया। हिन्दी पखवाड़े का समापन लुधियाना में डा आर टी पाटिल निदेशक सीफेट की अध्यक्षता में तथा अबोहर में डा बी पी शर्मा प्रींसिपल डीएवी कालेज अतिथि की उपस्थिति में 3.10.2008 को किया गया ।

अबोहर

लुधियाना

Public-Private Partnerships for Innovation in Agriculture

The public-private partnership is a new way of carrying out research and development and transfer of technology in agricultural sector. To meet the challenge of global food security, new partnerships in agricultural research and development are essential between public and private sectors that optimize the comparative advantages of each in pursuit mutually agreed objectives. These partnerships generate demand driven innovation for agricultural development and have various advantages such as ; reduced the costs and risks; improved quality and relevancy of results due to synergies among the partners, and ensure greater adoption by user groups; leads to the accumulation of complementary abilities, skills, and resources; leads to higher competitiveness and better market positioning as a result of improved competencies; and

promote development and poverty reduction by providing small-scale farmers with access to knowledge and technologies. It is therefore essential that senior level scientists of ICAR institutes and SAUs and other who are engaged in R&D and extension are exposed to basics of PPP mode and hence NAARM Hyderabad had organized this course during Oct 15-21, 2008. Dr. Narsaiah Sr. Scientist attended this training as participant. The major topics covered were PPP in Agribusiness: Indian Experiences, PPP in Food processing Industry, PPP- Value chains from Production to Consumption, PPP in NAIP, PPP-Partnership in Fisheries and Aquaculture, Opportunities in PPP, PPP in research for innovations in Agriculture an IARI Model and Economics of PPP. Dr. Patil, Director, CIPHET delivered a lecture on "Public-Private Partnerships in Food Processing Industry" to the participants on 18th October, 2008

Rural Managers to Accelerate Food Processing

The Government of India and the State government initiate various schemes for development of rural India from time to time however they can be effective if planned properly and executed systematically. Rural development has always been the prime focus of our government since independence. All five years plans were focused towards the special benefit of the rural community. One of the important sector which can help accelerate this development is food processing in production catchment. The example of operation flood started by the Dairy Development Board to collect milk, avoid the loss and produce milk and dairy products was very successful in Punjab, Haryana, Gujarat, Madhya Pradesh and the production of milk and milk based products jumped exponentially. Further the products were exported yielding high return of foreign exchange. That was one example of a successful rural development. As a result, farm income increased and the quality of life of the villagers. However this needs to be replicated for other food sectors and other areas of the country and it needs missionary approach to catalyze the process of sustainable and holistic rural development with justice, eliminate rural-urban divide in India and the rural managers can positively contribute in a professional way to eradicate rural backwardness. KIIT School of Rural Management (KSRM) is the second institute to take up this noble task after prestigious institute known as Indian Institute of Rural Management at Anand in Gujrat to cater to the growing needs of professionals in rural management. The main task of a rural management professional is planning systematic development of the region. To develop interest in adopting modern food processing technologies among the young rural managers On Oct 19, 2008, Director CIPHET addressed 150 students at KSRM on modern food processing technologies available for setting up enterprises at rural level and scope of public private partnership ventures in this sectors along with success stories of sugar cooperatives, Mahagrapes and other fruit grower associations.

Director CIPHET visits NRCWA for Enhanced Role of Women in Food Processing Activities

Women play a key role in agriculture though it has never been recognized fully. They work as female agricultural labourers, as farmers, co-farmers, family labourers and many a times as managers of the farm and farm entrepreneurs. Women in agriculture refer not only to women agricultural labourers and farmers but also to women working in the various sub-sectors of agriculture and allied non-farm work. Women constitute 40% of the agricultural workforce and

this percentage is rising. Today, 53% of all male workers, but 75% of all female workers and 85% of all rural female workers are in agriculture. An estimated 20% of rural households are de facto female headed due to widowhood, desertion, or male out-migration. Women work extensively in production of major grains and millets, in land preparation, seed selection and seedling production, sowing, applying manure, fertilizer and pesticide, weeding, transplanting, threshing, winnowing and harvesting. In livestock production, fish processing, collection of non-timber forest produce etc. women have a very large role. In animal husbandry, women have multiple roles, ranging from animal care, grazing, fodder collection and cleaning of animal sheds to processing of milk and livestock products. Keeping milch animals, small ruminants and backyard poultry is an important source of income for poor farm families and agricultural labourers. Women also predominate in various artisanal productions such as weaving mats and baskets etc. Landless women agricultural labourers are involved in most of the agricultural operations. Women also augment family resources through tasks such as collection of fuel, fodder, drinking water and water for family chores and domestic animals. But they still remain largely unacknowledged as farmers and agricultural workers.

To acknowledge women's work in agriculture and create women friendly technologies and refine the existing technologies for convenient use by women a National Research Centre for Women in Agriculture has been established by ICAR at Bhubaneshwar in the year in 1996. The role woman in processing and value addition of the locally grown crops is more important than production agriculture. The women are involved in processing of milk into butter and butter oil, preparing the pickle, papads and legume badies for use through out the year, the women are also responsible for safe storage of grain in the houses as well as storage of onion, garlic and chillies which are stocked in the production season and are properly dried and stirred in between for their safe storage. Traditionally also women were involved even in dal milling, rice milling and flour milling activities for the households. Due to their experience in sourcing food for their families and their safe storage they have natural instinct for food quality and safety. Hence there is a potential in upgrading their skills in food processing so that they can operate and manage scaled up operation of food processing and augment to the family income. To explore this possibility by active collaboration between CIPHET and NRCWA, Director CIPHET visited NRCWA on Oct 19 and gave a presentation of CIPHET developed technologies to be adopted for setting up women owned and operated micro and small scale food processing enterprises.

International Conference on Quality Production of Banana for Domestic and Export Market

Globally, bananas are important fruit crop both in domestic and export in large number of countries and provides economic livelihood and employment. India is the largest producer of banana and contributes 24% to total production which is largely consumed domestically and export is highly negligible. India bananas are highly competitive in trade, but is has not made much headway and past experiences has not been favourable for large scale export. This has been mainly due to the poor export quality of the banana fruit. In recent years, mainly improved technologies have been developed to improve the quality of banana and the farmers are practicing improved pre and post harvest technologies to maintain quality and by bagging the bunches, the colour and quality of the fingers are maintained . With improved packaging technology, the fruits reach the market in good quality. These practices are at present limited to

'niche' market for domestic trade only. International Conference on Quality Production of Banana for Domestic and Export Market was held at National Research Centre, Trichy during Oct 24-26, 2008 which was attended by international scientists from banana growing countries and provided best opportunity for the Indian banana industry to interact with them and understand the quality production of banana and also to develop strategies for developing quality banana production for export market from India. However, most of the banana farmers receive a low unit price for their produce as traders buy all the quantities and receive a discount for that business. Hence to promote the potential to adopt post harvest operations at village level or farm level so that framers share in this lucrative trade could be increased Dr. R. T. Patil, Director CIPHET presented a lead paper on "Modernization in Packaging of Banana for Domestic and Export Market" and explained the importance of various unit operation involved in post harvest management of banana in general and modern packaging techniques in particular. Director CIPHET also co-chaired a session on Post Harvest Management & Value Addition for Export Market along with Dr. Chandra ADG (Engg) as Chair and DR. Gokul Patnaik as Co Chair. The following papers were presented in the session:

1. Post-harvest management system for export market	Sh. Gokul Patnaik, New Delhi
2. Equipments and mechanization for quality production of banana for domestic and export market	Dr. Pitam Chandra, ICAR, New Delhi
3. Modernization of packaging of banana for domestic and export	Dr. R.T. Patil, Director, CIPHET, Ludhiana
4. Value Addition in banana for export market	Dr. C.K. Narayan, Trichy
5. Packaging and export of banana in Thailand	Ms. Pitsawat Buara, Thailand

CIPHET gets DST Sponsored Project on Development of Technology for Oil Expelling of Dehulled Flaxseed (linseed) Kernel and Utilization of De-oiled Cake

India stands fourth by producing around 3 lakh tonnes of flaxseed annually. Presently, the flaxseed (linseed) oil is used as medium in paint industries. This important oilseed is not being exploited for edible purposes though it is high in omega-3 fatty acid, lignin and protein. The flaxseed contains 22% hull and 32-38% oil. Hull is rich in lignin. If the lignin rich hull is separated from the kernel, it can be used as a source of dietary fiber in development of functional foods. The kernel can further be used for oil expelling; oil to be used as omega-3 enriched organic edible oil. The de-oiled cake, which is rich in protein and omega–3 fatty acid may have potential application in development of high value food products for human consumption and non-ruminant (poultry and fish) feed. The expelling of hull free kernel may be difficult because of high oil content and soft nature. This could be attempted by optimizing pretreatment and operational parameters of oil expelling. A complete package of practice and technology will be developed for mechanical dehulling, expelling of hull free kernel, and utilization of de-oiled cake as feed purposes. This will ensure proper utilization of flaxseed as a high value food, which is otherwise used as low value product. The CIPHET has received DST project worth Rs. 11 lakhs for development of technology for oil expelling of dehulled flaxseed kernel and utilization of deoiled cake. The team of the scientists working in the project will be composed of Dr. K. K. Singh as PI and Dr. Mridula D. & Dr. P. Barnwal as Co-PIs, Food Grains & Oilseeds Processing

Division. The main objective of the project is *to develop process technology for mechanical dehulling and oil expelling of flaxseed kernel and utilization of de-oiled cake for poultry feed.*

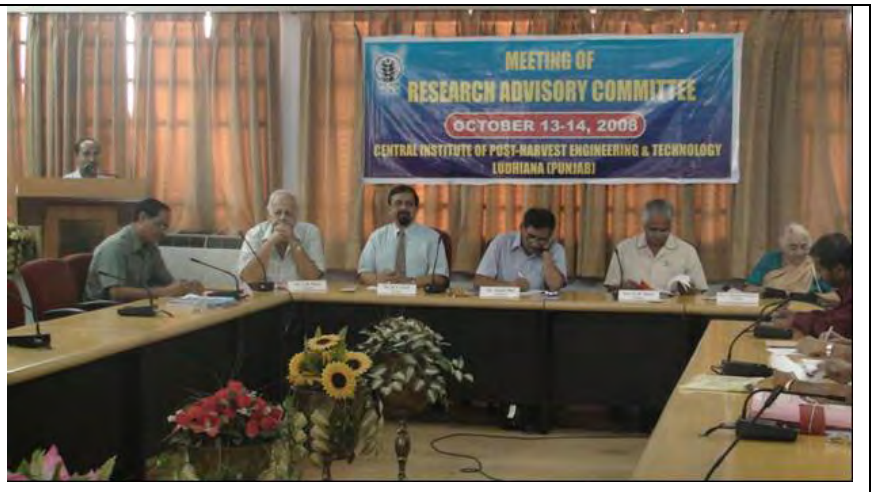
CIPHET gets DST Sponsored Project on Design and Development of Foam Mat Dryer for Selected Liquid Foods

Foam mat drying is a novel method of dehydration of liquid foods (Tomato, Kinnow, Pineapple and Mango) and highly suitable for heat sensitive fruit juices, dry sticky and viscous materials producing high quality instant foods in short time. The intrinsic instability of foams represents thus an important problem to be solved prior to foam processing. DST has sanctioned a Project entitled "Design and Development of Foam Mat Dryer for Selected Liquid Foods" under Food Processing" (IDP programme) cluster projects to CIPHET Ludhiana with total cost of Rs. 49.11 Lakh. The team of the scientists working in the project will be composed of Dr. Dattatreya M. Kadam as PI, and Dr.S. Balasubramanian, Dr. D R Rai and Dr. K. Narsaiah as Co-PIs, Food Grains & Oilseeds Processing Division. Under this project, Liquid concentrate along with a stabilizer is subjected to dehydration at low temperature in the form of a mat of foam. A continuous type pilot scale foam mat dryer will be designed and developed. A foam mat dryer suitable for dehydration of liquid foods will be developed for production of high quality reconstitutable powders. The process parameters for production of foam mat dried powders of tomato, kinnow, mango and pineapple will be optimized. This foam mat dryer will be scaled-up to continuous type industrial level to produce high quality foam dried powders with possible process controls.

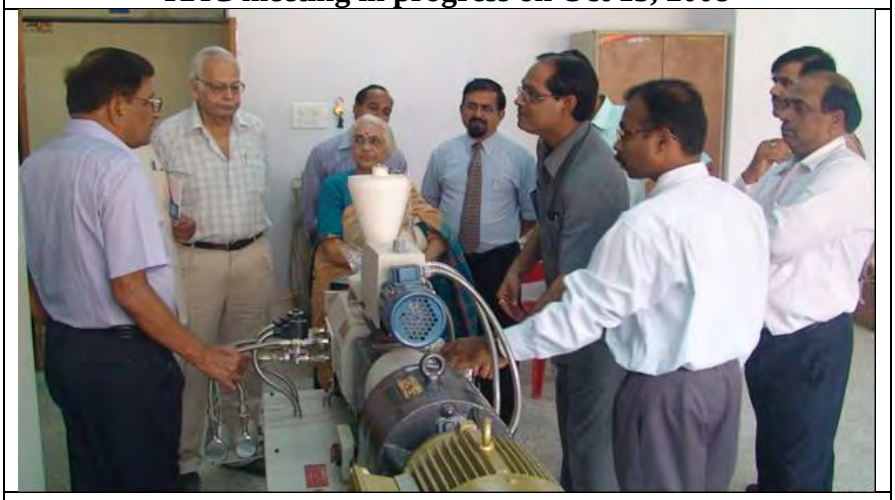
Research Advisory Committee Meeting of CIPHET, Ludhiana

First meeting of newly constituted Research Advisory Committee meeting was held under the Cairmanship of Prof. Satish Bal, IIT Kharagpur during October 13-14, 2008. The other members of RAC who participated in the meeting included Dr. G.R. More, Dr. Kanta. K. Shaama, Sh. C.K. Basu, Dr. N. C. Patil, Dr. R.T. Patil, Director CIPHET & Dr. R.K. Goyal Principal Scientist and I/C Head (AS & EC) and Member Secretary of RAC. Besides members, Dr. S.K. Nanda PC (PHT), Dr. P.R. Bhatnagar, PC (APA), Dr. K.K. Singh, Head (FG & OP), Dr. Mathew Prasad, Head (TOT) member, Dr. R.K. Gupta, Head (HCP) CIPHET Abohar also participated in the meeting.

The meeting began with welcome address of Dr. R.T. Patil, Director CIPHET followed by opening remarks of chairman and members. Chairman Professor Satish Bal in his remark said that middlemen play crucial rote in marketing of agricultural produce and products hence their input can not be ignored. There is a need to check these middlemen that they do not take undue advantage in marketing of these produce/ products. He further added that institute should develop simple technology to produce quality products for targeted group. He also added that processing levels in our country are very low in comparison to other developing & developed countries and efforts should be made to increase this level. He asked the scientists to make use of science in selecting a project which can yield result to solve a particular problem and technology developed should be marketable. He also added that technology transfer should continue till it becomes popular among the end uses/masses.



RAC meeting in progress on Oct 13, 2008



RAC members visiting the laboratories (twin screw extruder)

Training on Post Harvest Management of Fruits and Vegetables for Horticultural Officers from Uttrakhand

One week training programme was organized on Post Harvest Management of Fruits and Vegetables w.e.f. 13-19 October, 2008 at CIPHET, Abohar. 12 participants from Department of Horticulture, Government of Uttrakhand participated in the training programme. The training included various lectures including post harvest management of fruits and vegetables, role of cold chain in post harvest management of perishables, MAP including minimal processing of fruits and vegetables, plasticultural techniques for better productivity of fruits and vegetables, scope and uses of shrink packaging of fruits and vegetables and development of various value added products of fruits and vegetables. The training also included the practical classes on novel products from aonla, ber, guava, pomegranate etc. including demonstration of waxing plant. The participants were also exposed to different laboratory and field experiments going on different aspects of post harvest management of fruits and vegetables. The participants were also exposed to different field visits particularly multi-fruit juice plant, waxing and packaging unit of kinnow,

hi-tech nursery and scientifically managed farmers orchards. The training was conducted by Dr. R. K. Gupta, HOD (HCP) as Course coordinator and Shri V.K. Saharan, Technical Officer, as Co-course coordinator. The participants were awarded successful completion certificate by the chief guest Shri Surinder Jhakhar, Chairman, IFFCO in the valediction function. He urged the participants to disseminate the techniques learned during the training to the farmers and level so that the purpose of the training can be fulfilled in the larger interest of farmers and entrepreneurs.

CIPHET Scientist Attended National Consultation Meeting on Establishing a Technology Bank at National Institute of Rural Development

Dr. R.K. Gupta, Head, HCP attended National Consultation Meeting on Establishing a Technology Bank an institutional information repository of technologies to ensure rural development at National Institute of Rural Development, Hyderabad. The meeting was inaugurated by Dr. APJ Abdul Kalam, Former President of India on 20th October 2008. Further, the meeting was divided in seven sessions which included Lead paper presentation on Technology Bank by DG, NIRD, Enabling rural development through knowledge transfer: exploring AG Learn, The National Innovation Foundation, Ahmedabad: Work done in India, Capturing, repositing and disseminating technologies: The process issues for the Technology Bank, Te Bank Portal-A framework, Organizational structure of the Technology Bank and Financing the Technology Bank-Possibilities and options. Dr. Gupta has been given an opportunity to present CIPHET technologies in Session 4 and delegates appreciated the

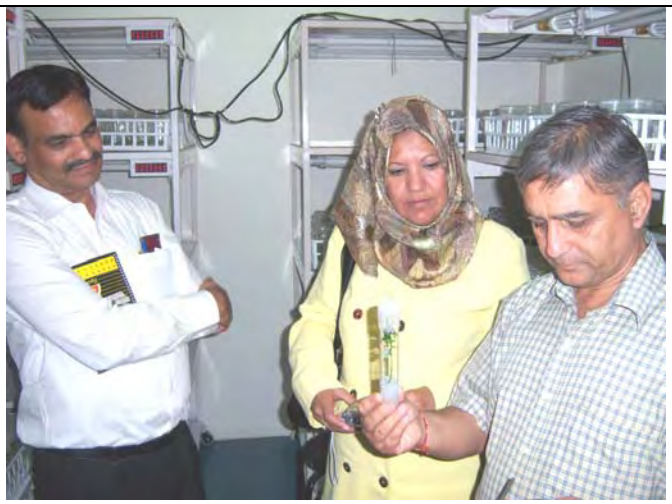
technologies developed. The participation of the National Consultation included selected R&D experts, R&D scientists and technologists, academics, policy makers, NGO personal, Business organizations etc. It is hoped that CIPHET may be offered an assignment to provide significant inputs in terms of technologies related to food processing which can be disseminated though Te Bank in rural community for generating income and employment.

International Training for Egypt Scientists

A team of two scientist namely Dr. Mohamed Atef El-Shobaky, Chief Researcher and Dr. Manal Mohammad Attia, Researcher, Horticulture Research Institute, Agricultural Research Centre, Ministry of agriculture, Cairo, Egypt have visited CIPHET during 20 October to 2nd November 2008 (Two week) under the Work Plan for the years 2007-08 beween ICAR& ARC Egypt. Scientists have been imparted training on **Post Harvest Management and Value addition including baking of Horticultural Produce.** The training cover almost all the important topics from maturity indices, safe harvesting of the produce, storage, packaging, low temperature storage, dehydration, preserve making and preparation of different products including baked one like guava leather from fruits and vegetables. The training also includes other novel products from fruits like guava, ber, aonla, pomegranate etc. Besides, scientists have visited various fruit orchards, Agricultural Research Station of RAU, Ganganagar, Punjab Agro Juices Ltd., Abohar, High tech nursery, Mauzgarh and PAU Regional Fruits Research Centre, Abohar. Besides they also saw the activities of High Tech Bharati Farm, Lodowal and Punjab Post Harvest Centre, PAU, Ludhiana. Dr. R.K. Gupta, Head, HCP was the training Coordinator and Dr. D. Dhingra, Sr. Scientist was Co-Coordinator.

Scientist visiting CIPHET, Abohar Orchards

Scientist visiting Haiyer Orchard at Abohar

	
Dr. Kaul of Agricultural Research Station, Ganganagar explaining citrus tissue culture techniques to the visiting scientists	Egyptian Scientists with CIPHET, Abohar faculty

CIPHET Scientist Attended Conference on Food Quality and Safety Management.

Dr S.N. Bhowmik, Sr. Scientist (Microbiology) attended a "Conference on current and innovative approaches in microbiological food safety management" at New Delhi that was jointly organized by International Life Sciences Institute-India (ILSI-India) and International Commission on Microbiological specification for foods (ICMSF) during 21-22, October 2008. Eminent speakers from institutes of national and international repute graced the occasion through several seminal presentations thus highlighting the various issues in the field of food safety and quality management that possess to be a prominent challenge globally. The two days conference did finally conclude with a dynamic workshop on microbiological testing in food safety management and quality control.

कटाई उपरान्त विषय से सम्बन्धित हिन्दी तकनीकी शब्दावली

कटाई उपरान्त अभियांत्रिकी एवं प्रौद्योगिकी विषयों से सबंद्ध शब्दावली निमार्ण करने के उद्देश्य से एक बैठक डॉ. आर.टी. पाटिल की अध्यक्षता में संस्थान के समिति कक्ष में सम्पन्न हुई। दिनांक 03–09–2008 को बैठक में वैज्ञानिक तथा तकनीकी शब्दावली आयोग के पूर्व अध्यक्ष डॉ. हरीश कुमार को विशेष रूप से आमत्रित किया गया। अब तक तकनीकी शब्दावली बनाने के कार्य की प्रगति का ब्योरा देते हुये डा0 के0 नरसईया ने बताया कि तकनीकी शब्दावली बनाने के लिए जो शब्द A से P तक डा0 हरिश कुमार के पास हिन्दी बनाने हेतु भेजे गये थे उन शब्दों का डा0 हरिश कुमार के सहयोग से हिन्दीकरण कर दिया गया है। डा0 हरिश कुमार द्वारा A से Z तक के कटाई उपरान्त विषय से सम्बन्धित शब्दों का विभिन्न विषयों से संकलन किया गया है। उपरोक्त समिति ने सर्वसम्मति से कहा कि Q से Z तक के तकनीकी शब्दों की हिन्दी बनाने का कार्य भी जल्द ही पूर्ण कर लिया जायेगा और इस तकनीकी शब्दावली को तैयार कर 7–8 महीने में ही प्रकाशित करने का प्रयास किया जायेगा।

Run for Fun by School Children through CIPHET

The students of Partap Public School participated in ‘Run for Fun’ race which was flagged off early on Friday morning (Oct 3, 2008) by Dr. R. T. Patil, Director of CIPHET. Nearly 400 students and teachers of the school participated in a run through CIPHET campus. All the students were dressed in coloured house T-shirt, the boys and girls exuded a spirit of camaraderie and sportsmanship. Families of CIPHET staff and Primary wing students of the school stood on either side of the route cheering the participants. Placards depicting, ‘Say no to drugs’ formed the added attraction. Gurshaminder Singh, Principal of the school set an example by running along, all through the race.


School children having fun running in CIPHET campus

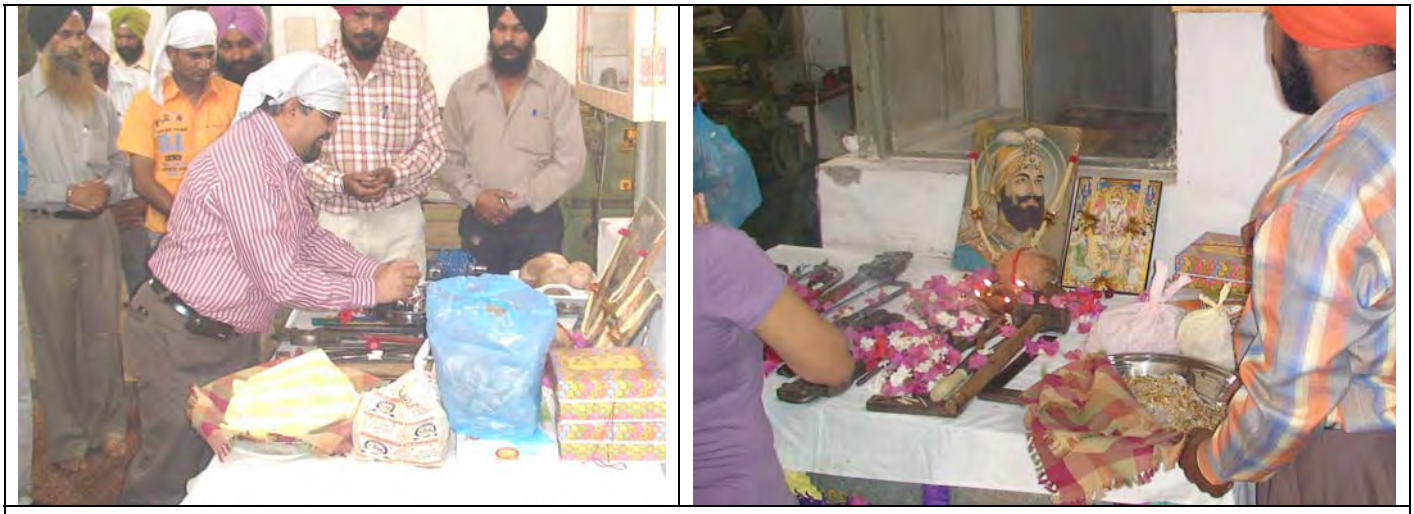
Soybean Training for Women Entrepreneurs

A training programme on processing of soybean for milk and tofu was organized during October 23-25, 2008 for women at CIPHET, Ludhiana. It was attended by four participants. The participants were given hands on training to prepare soymilk and tofu on commercial unit. The operation of soymilk plant, composition of soybean and soymilk, measurement of urease activity and economics of soymilk plant were covered under the training. Soymilk and tofu were successfully prepared by the participants.

Trainees with the processed soymilk

Vishwakarma Pooja

Staff Recreation Club of CIPHET Ludhiana organized Vishwakarma Pooja on 29-10-2008 in the workshop. Dr R T Patil, Director CIPHET, Dr S K Nanda, PC, PHT and President, Recreation club, all Head of Divisions and other staff of CIPHET participated in the Pooja. All the tools and machineries of Institute were worshiped by the staff members as token of gratitude.



Vishwakarma Pooja celebrated on 29-10-2008 by CIPHET Staff

Scientist Transferred

Dr. Matthew Prasad, Head, TOT has been selected to the post of Project Director, Educational Hill Agriculture Development Project, Dehradun under AAI(DU) and relived from this Institute in the afternoon of 24.10.2008.

Technology of the month

Minimal Processing of Pomegranate Arils

The pomegranate is a fruit tree of great adaptability to adverse climatic conditions, it is able to support severe colds, salinity soils, tolerate droughts and grow well under arid and semi arid conditions.. The fruit has a coriaceous rind whose colour could vary from yellow-greenish to intense red; the seeds surrounded by a sweet and juicy pulp (arils) correspond to the eatable portion and are separated by a white and astringent membrane. The Mridula and Bhagwa varieties are well known in India; the fruit is big, red, with a brilliant appearance, its peel thickness is moderate, arils are of good size, red and present a good juice yield with high soluble solids content, low acidity and a dark red colour due to the high content of anthocyanins. For this reason, it is considered as a good variety for fresh consumption and also to be processed.

The pomegranate is consumed mainly fresh, but the difficulty presented for peeling the fruit, has limited its consumption. The commercialization of fresh arils minimally processed and "ready-to-eat", could be a good alternative for the national and international market. The minimal

processing consists in the washing with sanitizing agents; reduce the initial microbial count, pH modifications, use of antioxidant agents, temperature control and others, to control partially the high perishability of the fruits. On the other hand, the use of polymeric film packaging in order to develop a micro controlled atmosphere, reduces the respiratory intensity and maintains unfavorable conditions for the action of many contaminating microorganisms.

Researches carried out on pomegranate minimally processes show a browning produced by oxidation of phenolic compounds during the storage, indicating that the stabilization of anthocynic pigments is essential in order to achieve a good quality. In India there is no research information available in minimally processing of pomegranate arils. The objective of this study was to evaluate the effect of semi permeable films, and the use of antioxidant mixture solution in the quality maintenance and shelf life of the minimally processed pomegranate arils of variety Mridula stored at 5 ± 1º C for 16 days.

Standardized Process Technology

The minimally processing of pomegranate arils included peeling the fruits carefully and manually at room temperature, eliminating arils having mechanical damage. Arils are washed by immersion in a sodium hypochlorite solution (100 ppm) for 5 min and allowed to dry by centrifuge or under fan. The separated and chlorine treated arils are dipped in the antioxidant solution (5% W/v Citric acid or Ascorbic Acid) for 30 seconds, dried and packed in 25µ semi permeable film (150 g of arils/bag).

Salient findings

Pomegranate arils treated with Chlorinated water for 5 minutes (Sodium hypochloride 100 ppm) + Antioxidant for 30 seconds (5% W/v Citric acid or Ascorbic Acid) and packed in 25 µSemi permeable film and store at 5 ± 1º C maintains quality, colour and shelf life up to 16 days with good physical and microbiological conditions for their commercialization. Anti oxidants were positive to reduce spoilage and retain colour, quality and chemical composition of arils.

Pomegranate arils treated with Chlorinated water (Sodium hypochloride 100 ppm) + Antioxidant (Citric Acid, Ascorbic Acid) and packed in 25 µSemi permeable film and stored up at Low temperature 5 ± 1º C for 16 days

Job opportunities

Walk in Interviews

Post 1: Research Associate

Name of the sub-project	Efficient expelling and extraction of oil from seeds and utilization of deoiled cake
Date of Completion of the project	02/11/2010
Research Associates:	One
Qualification	a) Essential: Ph.D. in relevant discipline or M. Tech./M.Sc. with 3 years research/teaching/design & development experience in Post–Harvest Engineering & Technology/Agricultural Process Engineering/Dairy & Food Engineering/Food Processing/Food Science/ Food Technology. b) Desirable: Exposure to design and development of processing equipment and statistical analysis software packages
Remuneration	Rs. 16000/ p.m. + 15% HRA + Rs. 100/ Medical Allowances
Age limit	35 years (with relaxation in case of SC/ST/OBC as per existing rules)
Date and place of interview	2/12/2008, 2:30 P.M. Central Institute of Post-harvest Engineering and Technology, PO: PAU, Ludhiana – 141 004, Punjab
	Dr. K. K. Singh, Principal Investigator & Head, Food Grains & Oilseeds Processing Division, CIPHET, PO : PAU campus, Ludhiana – 141 004, Punjab singh_ciae@yahoo.com

Post 2&3: 1 SRF and 1 JRF

Name of the sub-project	**Design and Development of Foam Mat Dryer for Selected Liquid Foods**
Date of Completion of the project	12/2011
Date and time of Interview:	**2nd December 2008 at 2.30PM**

Sl.	**Name of the**	**No. of**	**Duration**	**Emolument**	**Essential Qualification**

No	Positions	Positions			
1.	Senior Research Fellow (SRF)	1	36 months (Project Starting from December 2008)	Rs 14000 PM + 7.5% HRA for 3 years	M. Tech in Agril. Structure & Process Engineering/ Process and Food Engineering/ Post Harvest Engineering /Food Technology or M. Sc. in Food Science and Technology/ Food Nutrition **Desirable:** Exposure to design and development of processing equipment, AUTO CAD/ Pro E and statistical analysis software packages
2.		1	36 months (Project Starting from December 2008)	Rs 12000 PM + 7.5% HRA for the first two year & @ Rs 14000 PM + 7.5% HRA for third year	M. Sc. in Biochemistry / Microbiology (Preferably Food Biochemistry / Food Microbiology **Desirable:** Exposure to sample analysis, composition determination and statistical analysis software packages

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