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Cover page
Har Ghar Tringa Campaign, ICAR-CIPHET

Contents

From the Director's Desk

ICAR-CIPHET aims to develop and disseminate efficient and cost-effective post-harvest technologies to reduce wastage, enhance value, and improve the overall quality of agricultural products.

During this quarter, ICAR-CIPHET and its AICRPs have made significant technological advancements and contributions to post-harvest loss reduction, waste utilization, and public health safety. The scientists have developed various technologies including a photoreactor for ethylene degradation, a cryogenic grinding process for Safed Musli and Ashwagandha roots, the response of pulse beetle to microwave radiations, process optimization for laccase enzyme production, and production of vinegar using mango syrup waste. These technologies are expected to play a vital role in reducing post-harvest losses, utilizing agricultural waste, and addressing public health concerns. Furthermore, ICAR-AICRP on PEASEM, BAU Ranchi centre modified the design of the zero energy evaporative cooled chamber (ECC) specifically for on-farm storage of vegetables on the Ranchi plateau, ensuring better environmental control and enhancing the shelf life of vegetables. ICAR-NRC on Yak has also developed a portable shelter for yaks and herders, providing comfort in the harsh environments they face. Additionally, DBSKKV, Dapoli centre introduced GI-wire joints technology for constructing low-cost polyhouses under AICRP on PEASEM. Notably, a Stakeholders Meet on Makhana was organized at ICAR-Research Centre for Makhana, Darbhanga, Bihar, fostering collaboration and knowledge sharing. Furthermore, several Human Resource Development programs for students and farmers were organized and the institute was granted a patent for a microbial method of producing protein isolate/concentrate from oilseed cakes/meals while licensing two other technologies. The scientists also actively participated in workshops and seminars and published numerous research and popular articles, contributing to the scientific community's knowledge and dissemination.

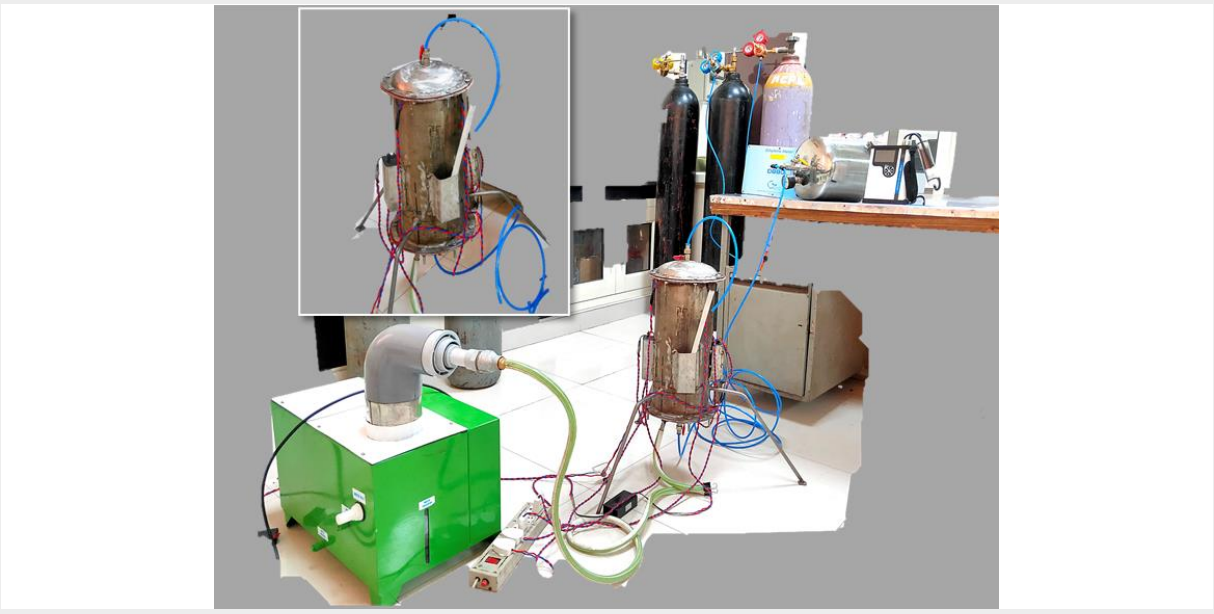
Dr. Nachiket Kotwaliwale

RESEARCH HIGHLIGHTS

Photoreactor for ethylene degradation

- Dr. Bhupendra M Ghodki, Er. Yogesh Kalnar, Dr. Poonam

A substantial quantity of fruits and vegetables is wasted due to undesirable ethylene exposure. A photoreactor for ethylene degradation was developed to meet the challenge of ethylene management in the supply chain. The photoreactor is novel in terms of photoreactor design, TiO_2 coating, and application of both photocatalytic and photochemical oxidation techniques in ethylene management for perishables. The photocatalytic and photochemical oxidation techniques comprise the use of ultraviolet (UV) radiation with or without a catalyst. In photocatalytic oxidation, a catalyst, primarily a semiconductor such as TiO_2, is essential which acts as a photocatalyst on irradiation with UV light (generally 200–380 nm catalyst dependent) and thus, facilitates the oxidation of ethylene at its surface. The degradation of methylene blue (MB) in the photocatalytic (UV-C + TiO_2) process was significantly higher than photolysis (UV-C) in a reactor. The degradation rate of MB increased with treatment (contact) time and TiO_2 loading content in the samples. The ethylene degradation ranged between 6.7 to 48% with varying concentrations of ethylene (nearly up to 200 ppm initial concentration of ethylene, degradation in 15-20 seconds). The installation of the photoreactor(s) in the storage facility will enhance the shelf life of bananas by 1.5-2 folds.



Photoreactor for Ethylene Degradation

Cryogenic grinding process for *Safed Musli* and *Ashwagandha* roots

- Dr. Pankaj Kumar, Dr. Manju Bala

Grinding of medicinal plants at ambient temperature generates heat that results in the loss of heat-labile constituents. *Safed Musli* (*Chlorophytum borivilinum*) and *Ashwagandha* (*Withaniasomnifera* L.) roots have been used in the traditional Indian medicine system since ancient times for the treatment of many human ailments. To minimize the particle size and specific energy consumption and maximize the retention of bioactive contents of this hard-to-grind *Safed Musli* roots, the cryogenic grinding conditions of lab model cryogenic grinder were optimized following three independent variables, viz., grinding temperature (-120 to -10 °C), grinder speed (2000-14000 rpm), and moisture content (6-12% w.b.) using response surface methodology (RSM). The numerical optimization indicated that 8.79% moisture content, −88 °C grinding temperature, and 8283 rpm grinder speed are optimum for cryogenic grinding of *Safed Musli* roots with 0.870 desirability. The particle size of *Safed Musli* powder obtained using optimized and validated cryogenic grinding conditions was 0.30 mm (as compared to 0.623mm at ambient grinding), with 369.82 mg/100g saponin content, 177.51mg GAE equivalent/100g total phenols, the specific energy consumption of 1.87 kWh/kg and colour difference as 1.267. Based on assumed selling prices for *Safed Musli* roots powder as Rs. 3800/- per kg, the Cost-Benefit Ratio of cryogenically ground *Safed Musli* roots powder was 0.69.

Cryogenically and ambiently ground powder of *Safed Musli* roots (a: cryogenic b: ambient)

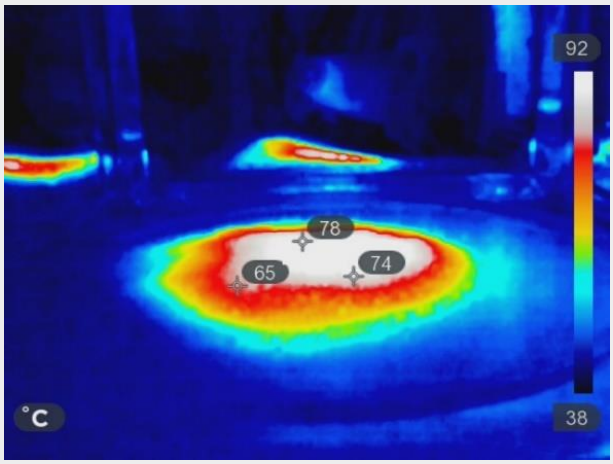
Similarly using the same variables, the grinding of *ashwagandha* roots was optimized. In order to maximize the retention of bioactive components during the grinding of *Ashwagandha* roots, the cryogenic grinding conditions of the lab model cryogenic grinder were optimized following three independent variables, viz., grinding temperature (-120 to -10 °C), grinder speed (2000-14000 rpm), and moisture content (6-12% w.b.) using response surface methodology (RSM). The numerical optimization indicated that 11.58% moisture content, −119 °C of grinding temperature, and 9477 rpm grinder speed are optimum for cryogenic grinding of *Ashwagandha* roots with 0.920desirability. The particle size of *Ashwagandha* powder, obtained using optimized and validated cryogenic grinding conditions was 0.321 mm (as compared to 0.623mm at ambient grinding), with 93.99 mg/100g essential oil, 798.99 mg (GAE equivalent/100g) total phenols, the specific energy consumption of 1.496 kWh/kg and colour difference as 1.544. The total cost of cryogenic grinding of *Ashwagandha* roots was about Rs. 900/-. Based on assumed selling prices for *Ashwagandha* roots powder as Rs. 1800/- per kg, the Cost-Benefit Ratio of cryogenically ground *Ashwagandha* roots powder was 0.70.

Cryogenically and ambiently ground powder of *Ashwagandha* (a: cryogenic b: ambient)

Response of pulse beetle, *Callasobruchus maculatus* infested in green gram to microwave radiations

- Dr. Guru PN

The effect of microwave radiations for control of pupal stage of bruchid (*Callosobruchus maculatus*), was done through a laboratory experiment. The source of microwave used in the study was a convection type domestic microwave oven (IFB 30SC®) with a rotating table having a 30-litre capacity and MW Power output – 900 W (consumption microwave: 1400 W, operation frequency: 2450 MHz, Power level: 100%). For experimentation 20 pupae were taken and exposed with commodity (green gram: 10mm layer) using 100 g sample in microwaveable petri dishes at different exposure periods i.e., 10-60 seconds in the microwave (P-HI level). The surface temperature of the grain was measured using an IR thermometer and thermal Imaging camera (Seek ™ Thermal). After microwave exposure, the dead pupae were counted and recorded at the interval of 15 min. Complete mortality was observed at an exposure of 30 seconds with a green gram layer of 10 mm at the receipt moisture content (9.54%). IR and thermal imaging average temperature showed that the effective exposure for 100% pupal mortality was 60±5 °C. However, when the pupae were exposed without green gram showed complete mortality at 40 seconds of exposure. Thus, an effective microwave exposure of 30-40 seconds is required for the complete killing of the bruchid pupae.

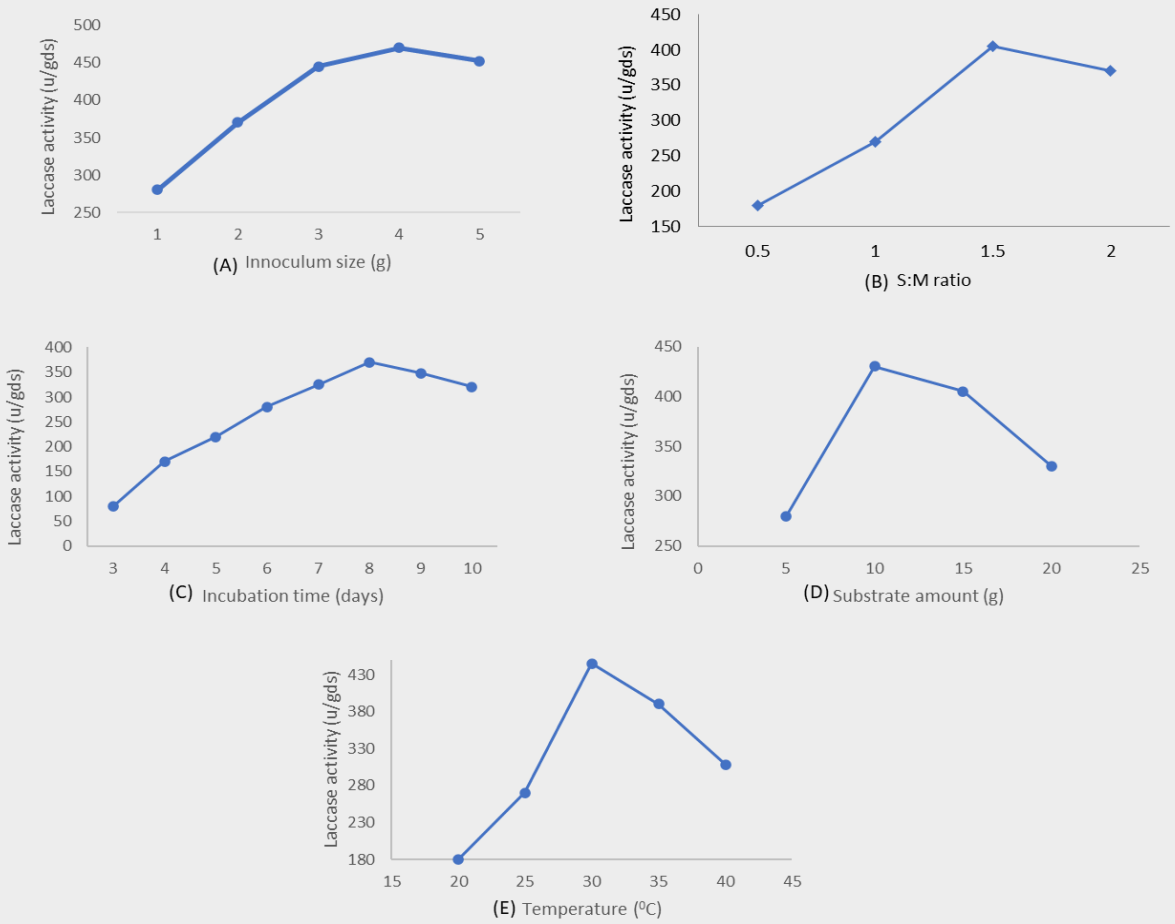


Thermal image showing temperature build up at 35s and 10mm layer

Optimization of solid-state fermentation conditions by One-Factor-at-a-Time (OFAT) approach for laccase enzyme production

- Ms. Surya, Dr. D.N. Yadav, Dr. Rajeev K. Kapoor

De-oiled rice bran (DORB) is an underutilized residue generated from rice oil industries in huge quantities. Being a lignocellulosic substrate, DORB is composed of cellulose (16.0%), hemicellulose (29.8%), and lignin (12.7%). The composition of DORB is beneficial for the growth of the fungus Trametes as it produces a Laccase enzyme to degrade the lignin in DORB. This will serve both purposes of biomass degradation and crude enzyme production. The present work focuses on the production optimization of physiological parameters for SSF was done by following a classical approach called One-Factor-at-a-Time (OFAT) in which only one factor/variable is changed at a time while keeping others fixed. All OFAT experiments were performed in triplicates using de-oiled rice bran as substrate. The sequential order of the OFAT experiment, variable and fixed factors, levels of variable factor, growth condition provided during OFAT experiment, and harvesting of samples for enzyme assay are incubation time (3-10 days), substrate amount (5-20g), incubation temperature (20-40°C), substrate to moisture (S: M) ratio (l:0.5-1:2.5) and inoculum size (1-5 disc). So, with each experiment, a particular factor got fixed and became part of the condition provided in the subsequent OFAT experiment. The harvesting of crude extract was done on the day that showed maximum laccase enzyme activity. Optimized conditions for maximum laccase enzyme production for OFAT experiments are incubation time (8 days), substrate amount (10g), incubation temperature (30°C), S: M ratio (1:1.5), and inoculum size (4 discs). Results are presented in Figure 1. From the results, it is inferred that the incubation size, incubation temperature, and S: M ratio significantly affected enzyme production.



Enzyme activity under OFAT conditions: (A) inoculum size, (B) S:M ratio, (C) incubation time, (D) substrate amount, (E) temperature.

Biological production of vinegar using syrup waste from osmotic dehydration of mango

- Dr. Prerna Nath, Dr. Ramesh Kumar, Dr. R C Kasana

Osmotic dehydration is one of the most suitable methods to increase the shelf life of various fruits. However, during the osmotic dehydration of fruits for product development, a large amount of waste generated in the form of sugar syrup takes place. Hence an attempt was made to convert the syrup waste from the osmotic dehydration of mango for the production of vinegar. The conversion of syrup waste from the osmotic dehydration of mango to vinegar was carried out in two steps. In the first step, alcoholic fermentation was carried out using yeast, and in the second step acetic acid fermentation by the acetic acid bacterium. The syrup waste from the osmotic dehydration of mango was diluted to 18 °B TSS. Fermentation of pasteurized syrup waste from osmotic dehydration of mango by commercial yeast at one percent inoculum at a temperature of 30 °C resulted in 9.5% alcohol after 5 days of incubation. In the second step, acetic acid fermentation by using locally isolated acetic acid bacterium from rotten kinnow fruit at 10% inoculum resulted in the production of vinegar with 5.8% acetic acid after 23 days of incubation. The vinegar produced from syrup waste from osmotic dehydration of mango showed good antimicrobial activity against *Staphylococcus aureus* and *E. coli* with a diameter of inhibition zone ranging from 2.4 cm to 2.9 cm. The findings of the current study confirm the usefulness

of vinegar produced from syrup waste from the osmotic- dehydration of mango as a natural sanitizer that inhibits the growth of pathogenic bacteria.

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Alcoholic fermentation of syrup from osmotic dehydration of mango after 5 days

AICRP on PEASEM

Modified evaporative cooled chamber (ECC)

The existing design of the zero energy evaporative cooled chamber (ECC) has been modified for the Ranchi plateau by the BAU Ranchi centre for the on-farm storage of vegetables. The modified design of ECC ensures better environmental control to enhance the shelf life of vegetables. A model of ECC having a length of 2.4 m, width of 1.5 m, and height of 1.8 m has been constructed. The modified ECC is fitted with a forced cooling fan-pad system operational using solar power. The capacity of the structure is 400 kg (20 crates of 20 kg). The storage structure is of double-walled/parallel walls type of 2.5 m in which cooling pads were fixed. The cavity between the two walls is 8cm and is filled with river sand. The top head of the structure is covered with a mat made of palm leaf. The top view, side view, and the isometric view are shown in the figure. The front wall of 2.5 m consists of two exhaust fans and a door. Humidity of 85-90% and 8-10°C lower than the ambient temperature is maintained in the ECC against the outside temperature of 40-42°C and RH of 50-55%. The shelf life of leafy vegetables like spinach and lettuce, okra, cabbage, etc. is extended to 4-6 days. The approximate cost of the structure is Rs 60000.

Modified evaporative-cooled chamber

Development of portable shelter for yak and herders

ICAR-NRCY, Dirang developed a portable shelter for yak and herders. There is a chance of sudden rainfall at high altitude areas of Arunachal Pradesh, where normally yak is reared. To protect the animal and herder a portable shelter has been developed by the ICAR-NRCY, Dirang under the project AICRP on PEASEM. The shelter has the dimensions of 4.5 m x 3.0 m which was fabricated using triple layered (MultiPro) CPVC pipes (40mm and 25mm diameter), GI anchoring pegs (32 mm diameter), nylon rope (8mm diameter), GI rod and anchoring pegs (10mm diameter), shade net and tarpaulin. This type of shelter is suitable for herding 4 adult yak females or 10-15 yak calves. The tent can also be used as a yak herder's shelter. The approximate weight of the shelter material is around 36 kg and the approximate cost is Rs. 35,000/-.

Portable shelter for yak and herders

Bamboo joints using GI wires for polyhouses

Small and marginal farmers are mostly using bamboo as a structural material for making a frame of polyhouse. Bamboo is used as an alternative construction material for developing low-cost polyhouses as the cost of metal polyhouses is one of the constraints in their adoption by the farmers. The durability and stability of the structure depends on the joints. DBSKKV, Dapoli centre developed GI-wire joints technology for bamboo polyhouses under the project AICRP on PEASEM. Brackets along with nut bolts were used for standard joint-making fixtures which were to be fabricated out of MS flats incurring higher costs and requiring more time. Therefore, as an alternate

solution, Dapoli centre has invented and standardized cost-effective, reliable, and faster technology for bamboo joints using GI wires.

Side joints between bottom chord and side column.

Joints between the center column, rafter, and purlin

AICRP on PHET

Process technology for the preparation of foxtail millet-based instant *upma* mix

Foxtail millet-based instant *upma* mix was prepared using millet semolina (100 g), dehydrated vegetables (carrots, green chilies- 5g each), and fried spices (mustard, *jeera*, bengal gram- 5 g each). Foxtail millet semolina was obtained by using a mini pulverizer followed by sieving. Semolina was dry roasted for 5 minutes, and dehydrated vegetables and spices was added to the mix and packed in HDPE pouches. To prepare the control sample, foxtail millet semolina in the above mix was replaced with wheat semolina. Results of sensory evaluation revealed higher acceptance of foxtail millet-based *upma* mix compared to the control. The following parameters were analyzed for both samples.

Foxtail millet-based instant *upma* mix

Parameters	**Foxtail Millet *Upma***	**Control *Upma***
Cooking time	10.5 min	12.5 min
Rehydration ratio	1:4	1:3
Water uptake ratio	60%	45%

Cooked weight	Increased by 4 times	Increased by 5 times

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- महेश कुमार सामोता और पूनम चौधरी (2022). लहसुन के गुणकारी उत्पाद। भाकृअनुप-केंद्रीय कटाई-उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान, लुधियाना, पंजाब द्वारा प्रकाशित "प्याज, लहसुन और मिर्च का प्रसंस्करण और मूल्यवर्धन" प्रशिक्षण पुस्तिका (संपादक: महेश कुमार सामोता, पूनम चौधरी, हरफूल सिंह, लाला राम बलाई)।
- पूनम चौधरी और महेश कुमार समोता (2022). लहसुन का कटाई उपरांत प्रबंधन। भाकृअनुप-केंद्रीय कटाई-उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान, लुधियाना, पंजाब द्वारा प्रकाशित "प्याज, लहसुन और मिर्च का प्रसंस्करण और मूल्यवर्धन" प्रशिक्षण पुस्तिका (संपादक: महेश कुमार सामोता, पूनम चौधरी, हरफूल सिंह, लाला राम बलाई)।
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- टी एच विद्यालक्ष्मी देवी, ख्वैराकपम बेमबेम, रेणु बालाकृष्णन और पूनम चौधरी (2022). अदरक: संभावित लाभ और इसके मूल्यवर्धित उत्पाद। भाकृअनुप-केंद्रीय कटाई- उपरांत अभियांत्रिकी एवं

प्रौद्योगिकी संस्थान, लुधियाना, पंजाब द्वारा प्रकाशित "प्याज, लहसुन और मिर्च का प्रसंस्करण और मूल्यवर्धन" प्रशिक्षण पुस्तिका (संपादक: महेश कुमार सामोता, पूनम चौधरी, हरफूल सिंह, लाला राम बलाई)।

- ख्वाईराकपम बेमबेम, रेणु बालाकृष्णन और थ. बिद्यालक्ष्मी देवी (2022) प्याज और सूखे गुच्छे और पाउडर का मूल्यवर्धन। भाकृअनुप-केंद्रीय कटाई- उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान, लुधियाना, पंजाब द्वारा प्रकाशित "प्याज, लहसुन और मिर्च का प्रसंस्करण और मूल्यवर्धन" प्रशिक्षण पुस्तिका (संपादक: महेश कुमार सामोता, पूनम चौधरी, हरफूल सिंह, लाला राम बलाई)।

हिंदी पखवाड़ा

- आर. के. सिंह, पूनम, ठ. बिद्यालक्ष्मी देवी, महेश कुमार समोता, प्रज्ञा सिंह, प्रमोद शर्मा, राजेश कुमार, कुंवर सिंह (2022) हिंदी पखवाड़ा समिति द्वारा भाकृअनुप- केंद्रीय कटाई-उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान, लुधियाना में 14 सितम्बर 2022 को हिंदी दिवस और हिंदी पखवाडे का शुभारम्भ कार्यक्रम आयोजित किया गया।

EVENTS/ACTIVITES/VISITS

Events organized

Independence Day Celebration: ICAR-CIPHET celebrated its 75th Independence Day on 15 Aug, 2022. Various events and sports activities were organized on the occasion.

- National Flag was hoisted by every staff member from 13-15 Aug, 2022 to celebrate '*Har Ghar Tiranga*' campaign to commemorate the 75th Independence Day. On this occasion, our national flag was distributed to every staff member of the institute.

Har Ghar Tiranga campaign

- **Stakeholders Meet on *Makhana*:** ICAR-CIPHET, Ludhiana organized the 'Stakeholders Meet on *Makhana*' on 5 Sep, 2022 at ICAR-Research Centre for *Makhana*, Darbhanga, Bihar in collaboration with ICAR-Research Complex for Eastern Region, Patna. Dr. S.N. Jha, Hon'ble DDG (Agril Engg.), ICAR, New Delhi chaired the programme. More than 175 *Makhana* farmers/ entrepreneurs/ members of FPOs & SHGs from Darbhanga and Madhubani districts, various officers from the Department of Agriculture, Government of Bihar.

Delegate visits

Address of visitors	Number of visitors	Date of visit
Sh. Raghunath B, Chief General Manager (CGM), National Bank for Agriculture and Rural Development (NABARD), Chandigarh (Punjab)	1	18 Jul, 2022
Dr. R K Pruthi, Director of Horticulture, Himachal Pradesh	1	18 Jul, 2022
Shri. Fauja Singh Sarari, Honourable Minister of Horticulture & Food Processing, Govt. of Punjab Sh K A P Sinha, Additional Chief Secretary, Govt of Punjab Sh Rajnish Tuli, MD, Punjab Agro Industries Corporation Limited	3	9 Aug, 2022
Sh. G.D. Sharma, Joint Secretary Finance, ICAR Headquarters, New Delhi	1	16 Aug, 2022
Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior	2	9 Jul, 2022

Farmer visits

- Twenty-five farmers from the Hanumangarh district of Rajasthan visited ICAR-CIPHET Abohar on 13 Sep, 2022. The visit was organized by NABARD and *Samaj Kalyan AvamSamnvit Vikas Sanstha* (SWIDS) of Hanumangarh.

Students visits

- 3 faculty members and 20 students from Govt. Polytechnic College for Girls, Ludhiana visited the facilities of ICAR-CIPHET on 14 Jul 2022.

HUMAN RESOURCE DEVELOPMENT

Various programmes attended

Name of the scientist	Programme attended	Organized by	Date
Dr.Nachiket Kotwaliwale	Executive Development Management Programme (EDP) for Leadership Development	ICAR-NAARM, Hyderabad (offline)	4-9 Jul, 2022.
Dr. Th. Bidyalakshmi Devi	Online workshop programme on CAD	ICAR-CIAE, Bhopal	7 Jul- 6 Aug, 2022
Dr. Leena Kumari and Er. Sunita Thongam Devi	Training on Additive manufacturing and 3D printing' jointly organized by the Electronics and ICT Academies	IIT Roorkee, MNIT Jaipur, NIT Patna, and PDPM IIITDM Jabalpur	18-29 Jul, 2022
Dr. Sandeep Mann and Dr. K Narsiah	Program on Managing value chain of Technology for Directors and HOD's	ASCI Hyderabad	25-29 Jul, 2022

Dr. Mridula D.	Online training programme on Promotion of Biofortification for Ensuring Nutritional Security	National Institute of Agricultural Extension Management (MANAGE), Hyderabad and Punjab Agricultural Management & Extension Training Institute (PAMETI), Ludhiana, Punjab	27-29 Jul, 2022
Dr. Mridula D.	Online training programme on Linking Farmers to Markets	National Institute of Agricultural Extension Management (MANAGE), Hyderabad, and Punjab Agricultural Management & Extension Training Institute (PAMETI), Ludhiana, Punjab	16-18 Aug, 2022
Dr. Guru P. N.	Stakeholders Workshop on Grain Storage and Pest Management	CSIR-CFTRI, Mysuru	17-18 Aug, 2022
Dr.Poonam Choudhary	DBT-sponsored training on Biosecurity and Biosafety: Policies, Diagnostics, Phytosanitary treatments, and Issues	ICAR-National Bureau of Plant Genetic Resources, New Delhi	2-11 Aug, 2022
Dr. B. M. Ghodki	Management of Digital Hygiene: Staying Secure in Cyber Space	DST, GOI under 'National Online Training Programme for Scientists & Technologists Working in Govt. Sector'	22-26 Aug, 2022
Er. Shaghaf Kaukab and Er. Thongam Sunita Devi	Training in MATLAB programming	MNIT Jaipur, NIT Patna, and PDPM IIITDM Jabalpur	22 Aug -2 Sep, 2022
Sh. Gurdeep Singh and Vishal Kumar	Training on Motivation, positive thinking, and communication skills for ICAR Technical officers	ICAR-NAARM, Hyderabad	13-16 Sep, 2022
Dr. Vikas Kumar	Virtual training on Uncertainty of Measurement and Decision Rule as per ISO/IEC 17025:2017	Quality Council of India	15-16 Sep, 2022
Dr.Nachiket Kotwaliwale, Dr. K. Narsaiah, and Dr. RK. Vishwakarma	BIMSTEC Workshop (virtual mode) on Encouraging Private Sector Participation especially in Value Chain Management for Agricultural Products Developing Value Chain through Post Harvest Management		15-16 Aug, 2022

TRANSFER OF TECHNOLOGY

- Licensed the technology and imparted the training on the 'Jamun Bar Preparation process' to Mr. Subhash Chandra, Vasant Vihar Enclave, Dehradun during 1 - 2 Jul 2022 with license fee Rs. 16,000/- + 18% GST.

- Licensing of technology entitled "Microbial method for production of protein isolate/concentrate from oilseed cakes/meals" to M/s BNK Agri Foods Pvt. Ltd., Omaxe Riviera, Rudrapur, Udham Singh Nagar, Uttarakhand on 1 Aug 2022.

PATENT GRANTED

S. No.	Application No.	Title	Date of filing	Date of grant	Inventors
1.	201911012570	Microbial method for production of protein isolate/concentrate from oilseed cakes/meals	29.03.2019	21.09.2022	Dr. D. N. Yadav Dr. Sangita Bansal Dr. R. K. Singh Dr. S. N. Jha

EXTENSION ACTIVITIES

SCSP Training

Programme Title	Venue	Duration	No. of Participants
Processing and value addition of Cereals, Millets and Pulses	*Ghumnewal* and *Maniewal*villages, Ludhiana	29-31 Aug 2022	50
Processing and value addition of Onion, Garlic and Chilli	KVK, Fatehpur, Sikar, Rajasthan	16-18 Aug 2022	50
Post-harvest Management and Processing of Fruits and Vegetables of Temperate Zone of HP	Department of Horticulture, Mandi, Himachal Pradesh	12-14 Sep 2022	50

Farmers Training

- ICAR-CIPHET, Ludhiana organized a two days training programme on 'Processing and Value Addition of *Makhana*' in collaboration with ICAR-Research Complex for Eastern Region, Patna during 6-7 Sep 2022 at ICAR-Research Centre for *Makhana*, Darbhanga, Bihar. More than 170 *Makhana* farmers/ entrepreneurs/ members of FPOs & SHGs in Darbhanga and Madhubani districts benefitted through this training programme.
- ICAR-CIPHET organized farmers' training on 'Post-Harvest Technology for Agricultural Produce' sponsored by Project Director, ATMA, Jalgaon, Maharashtra during 13-17 Sep 2022 at ICAR-CIPHET, Ludhiana.

Students Training

- ICAR-CIPHET organized a training programme under 'Institutional Development Plan (IDP): Skill development Programme on 'Farm Mechanization for Post-Harvest Operations' under the World Bank NAHEP Project for 30 students of ANGRAU from 1-31 Jul 2022.

Entrepreneurship Development Programme

- A training on "honey processing and packaging" has been organized at ICAR-CIPHET by Farmer FIRST Team to Mr. Deepak Sunda from Banga, SBS Nagar, Punjab on 22 Jul 2022.

- EDP on PHM-Cold Room, Cold Storage, Ripening Chamber, and Reefer-van was organized from 19-24 Sep 2022 for horticulture entrepreneurs. Two entrepreneurs attended the programme.

Monitoring and Evaluation

- Farmer FIRST Team, ICAR-CIPHET, visited Agro-Processing Center, Khalsa Farm, Balchour, Shaheed Bhagat Singh Nagar (Nawanshahr) on 20 Aug 2022.

- Farmer FIRST Team, ICAR-CIPHET, visited the bee farm of Mr. Shamsher Singh, Dhuri, Sangrur, Punjab on 8 Sep 2022. They were guided about the processing and packaging of honey. They were advised to sell their processed honey in the retail market with proper packaging instead of selling raw honey in bulk to traders and wholesalers. They were also guided for FSSAI registration, brand development, and quality testing of final products.

KVK ACTIVITIES

Training Organized

- Training on management of pest and diseases in kharif crops with emphasis on "Control of pink bollworm" was organized on 12 Jul 2022. Six farmers participated in this training programme.

- Training on Nursery Management Techniques was organized on 16 Jul 2022. Fourteen farmers participated in this training programme.

- Off-campus training on the Development of a low-cost balance diet at *Churiwala Dhanna* village was organized on 25 Jul 2022. Thirty-four farm women participated in this training.

- Training on drudgery reduction techniques of farm women under OFT village was organized at Bahaval Basi on 27 Jul 2022 for 35 participants.

- On-campus training on Value addition and processing of fruits for Anganwadi workers was conducted during 22-23 Aug 2022 for 30 participants from Abohar block

- On-Campus training on Masala making was organized for farm women during 29-31 Aug 2022. Twenty-six farm women from different villages participated in this training programme.

- Organized on-campus training on the management of pests and diseases in winter vegetables on 14 Sep 2022. Twenty-six participants attended this training.

Awareness Programme

- Parthenium Awareness Week was organized from 16-22 Aug 2022. During this week, different activities like awareness campaigns on the use of weedicide to check this weed and making manure from Parthenium have been organized.

- A school-level awareness seminar was organized at Maya Devi Memorial School Kera Khera village, Abohar on 7 Sep 2022 under the activities of National Nutrition Week. In this programme, 70 students participated successfully.

- An awareness webinar on Nutritious diet management was organized on 8 Sep 2022 under the activities of National Nutrition Week. Forty-one participants attended the webinar.

OTHER ACTIVITIES

- Dr. B. M. Ghodki presented a virtual talk on 'Prediction of sustainability model in food processing' as an Invited Speaker at the KARYASHALA scheme SERB Initiative - a five-day High-International Workshop on 'Sustainable Disruptive Technology in Agri-food Sector for Processing and Preservation' organized by Food Process Engg. Deptt., NIT Rourkela (11-15 Jul 2022) on 15 Jul 2022.
- Dr. Chandan Solanki visited NutriHub, IIMR and their three incubates at Hyderabad for the processing of millets and discussed their processing-related challenges during 25-26 Aug 2022.
- Dr. Guru P. N. attended the consultancy work of 'Technical support for safe storage of food grade *Mahua* flower at Chhattisgarh State Minor Forest Produce Co-operative Federation Ltd., Raipur' as per their request from 26 Aug 2022 to 02 Sep 2022 at Raipur, Chhattisgarh.
- Dr. Guru P. N. attended the 9th meeting of FAD 16 Panel II for the discussion regarding IS 7247 Fumigation of agricultural produce – Code of practice: part 3 Aluminium Phosphide (Phosphine)
- Dr. Ramesh Kumar delivered a lecture on the benefits of 'Nano Urea' during the '*SahkariVikreta* Training programme' organized by IFFCO on 21 Jul 2022.

PERSONALIA

- Sh. Permod Sharma joined ICAR-CIPHET as FAO on 1 Jul 2022.
- Sh. H.L. Meena transferred to ICAR-IIMR, Ludhiana as SAO on 16 Jun 2022.

CIPHET IN NEWS

कम लागत में संतुलित आहार बनाने पर असंस्थागत प्रशिक्षण का आयोजन

कार्यक्रम में संबोधित करते हुए डा. रूपेंद्र कौर।

सवेरा न्यूज/धर्मवीर, (अबोहर) : कृषि विज्ञान केंद्र/सीफेट अबोहर द्वारा कम लागत में पौष्टिक आहार बनाने पर चूहड़ीवाला धन्ना गांव में असंस्थागत प्रशिक्षण का आयोजन किया गया। इस कार्यक्रम का संचालन प्रभारी कृषि विज्ञान केंद्र डा. रमेश कुमार के निर्देशन में डा. रूपेंद्र कौर द्वारा किया गया। इस कार्यक्रम में 29 ग्रामीण महिलाओं एवं लड़कियों ने हिस्सा लिया। इस कार्यक्रम के तहत डॉक्टर रूपेंद्र कौर द्वारा विभिन्न तरह के उत्पाद जैसे पौष्टिक दलिया, सेरेलैक बेबी मिक्स पाउडर इत्यादि बनाने पर महिलाओं के समक्ष प्रायोगिक प्रदर्शन द्वारा संपूर्ण जानकारी दी तथा बातों के भंडारण के उचित तरीकों के बारे में भी विस्तार से बताया। डा. रमेश कुमार द्वारा इस तरह के कम लागत वाले मूल्य संवर्धित उत्पाद बना कर आय उपार्जन करने के विभिन्न तरीकों के बारे में बताया तथा एसीटीओ पृथ्वीराज ने कृषि विज्ञान केंद्र द्वारा चलाए जाने वाले विभिन्न तरह के कार्यक्रमों के बारे में अवगत करवाया।

DainikSaveraTimes
epaper.dainiksaveratimes.in

कृषक महिलाओं के लिए मसाले बनाने की तकनीक पर तीन दिवसीय प्रशिक्षण का आयोजन

सवेरा न्यूज/कथूरिया (अबोहर) : कृषक महिलाओं के लिए मसाले बनाने की तकनीक पर तीन दिवसीय प्रशिक्षण का आयोजन किया गया। इस कार्यक्रम का संचालन प्रभारी कृषि विज्ञान केंद्र डा. रमेश कुमार के निर्देशन में डा. रूपेंद्र कौर द्वारा किया गया। इस कार्यक्रम में डा. रूपेंद्र कौर द्वारा मसालों की आहार में उपयोगिता, मसालों के स्वास्थ्य लाभ एवं मसाले बनाने के लिए साबुत मसालों का चयन करने की प्रक्रिया तथा उत्पाद के रखरखाव के उपायों के बारे में विस्तारपूर्वक चर्चा की गई। साथ ही विभिन्न तरह के मसाले जैसे गरम मसाला, रसदार मसाला, चाय का मसाला, चाट मसाला इत्यादि बनाने पर प्रायोगिक कार्य भी करवाया गया। डा. रमेश कुमार द्वारा मसाला उद्योग स्थापित करने के लिए ध्यान रखने योग्य मुख्य बिंदुओं पर चर्चा करते हुए प्रतिभागियों को छोटे स्तर पर स्वरोजगार अपनाने के लिए तथा कृषि विज्ञान केंद्र द्वारा चलाए जाने वाले विभिन्न तरह के प्रशिक्षण कार्यक्रमों में भाग लेने के लिए प्रेरित किया। इस कार्यक्रम में तेजस्वी फाऊंडेशन फॉर सोशल एक्सीलेंस की पंजाब प्रधान ममता जसूजा व भारतीय आजीविका मिशन की सक्रिय सदस्य मजूबाला के साथ स्वयं सहायता समूह की कुल 26 महिला प्रतिभागी ने भाग लेकर कार्यक्रम को सफल बनाया।

प्रतिभागी को सम्मानित करते हुए सीफेट प्रभारी डा. रमेश कुमार।

सीफेट ने मायादेवी स्कूल में संतुलित आहार पर करवाया सैमीनार

प्रशस्तिपत्र देकर सम्मानित करते हुए माया देवी स्कूल के प्रबंधक।

सवेरा न्यूज/कथूरिया अबोहर : माया देवी स्कूल में बुधवार को स्कूल प्रांगण में सीफेट की ओर से डा. रूपिंदर कौर ने नेशनल न्यूट्रीशन सप्ताह के तहत संतुलित आहार पर एक सैमीनार किया। इस दौरान डा. कौर ने बच्चों को संतुलित आहार के फायदे व स्त्रोतों के बारे में अवगत करवाया। उन्होंने बताया कि खान-पान की गलत आदतों की वजह से ही बच्चे अक्सर बीमार पड़ जाते हैं व शारीरिक और मानसिक पीड़ा झेलते हैं। डा. कौर ने कि खाने पीने की कौन सी चीजें हमें खानी चाहिए और कौन सी वस्तुओं से परहेज करना चाहिए। इस सैमीनार से पहले संतुलित आहार पर आधारित एक झाड़ग कंपटीशन भी करवाया गया। डा. कौर व उनकी टीम ने विजेता छात्रों को सर्टीफिकेट व इनाम देकर सम्मानित किया। स्कूल के डायरैक्टर राजकुमार ने मैडम कौर व उनकी टीम का धन्यवाद देते हुए उन्हें प्रशस्तिपत्र से सम्मानित किया।

कृषक महिलाओं में कार्यभार कम करने की तकनीक पर असंस्थागत प्रशिक्षण का आयोजन

महिलाओं को संबोधित करते हुए डा. रूपेंद्र कौर।

कृषक महिलाओं के लिए आचार बनाने की तकनीक पर असंस्थागत प्रशिक्षण

आयोजन में हिस्सा लेते हुए महिलाएं।

न्यूज गैलरी

दो दिवसीय प्रशिक्षण आयोजित

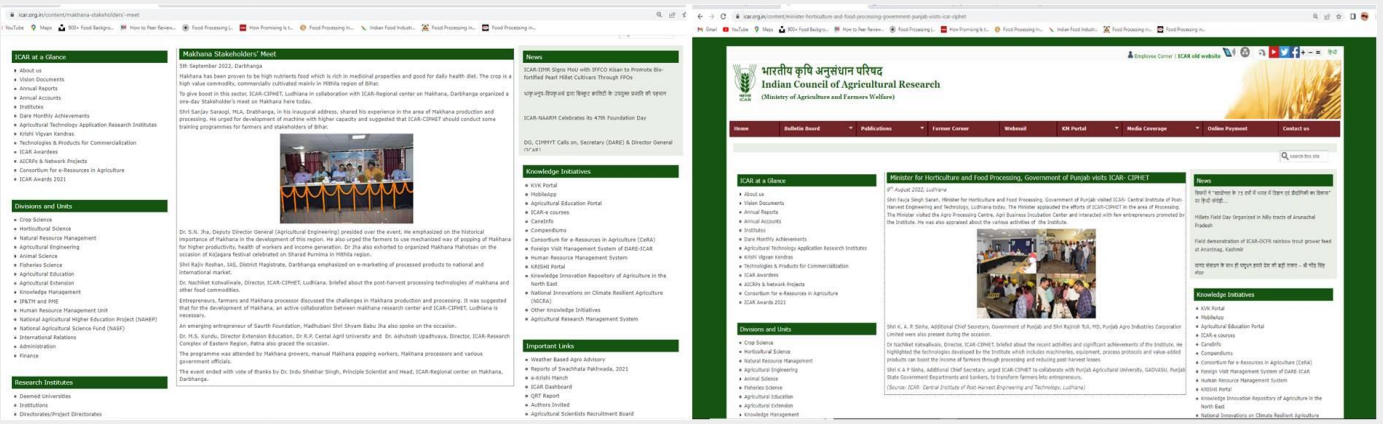
आंगनवाड़ी कार्यकर्ता को प्रशिक्षण पत्र देते हुए केन्द्र के संचालक।

सवेरा न्यूज/कथूरिया अबोहर : कृषि विज्ञान केंद्र सीफेट की ओर से फल प्रसंस्करण तकनीकी पर दो दिवसीय प्रशिक्षण का आयोजन किया गया। कार्यक्रम का संचालन प्रभारी कृषि विज्ञान केंद्र डा. रमेश कुमार के निर्देशन में डा. रूपेंद्र कौर ने किया। कार्यक्रम में डा. रूपेंद्र कौर ने आंगनवाड़ी कार्यकर्त्ताओं को फलों के आहार में उपयोगिता, संरक्षण एवं विभिन्न उत्पाद बनाने के लिए फलों का चयन करने की प्रक्रिया तथा उत्पाद के रखरखाव के उपायों के बारे में विस्तारपूर्वक जानकारी दी। फल प्रसंस्करण से संबंधित उपकरणों के बारे में बताते हुए भ्रमण करवाया गया। डा. रमेश कुमार ने आंवले से बनने वाले विभिन्न तरह के उत्पादों की जानकारी दी। मौसमी फल जैसे अमरूद का जैम एवं स्कवॉश बनाने पर विधि प्रदर्शन भी दिया गया। पृथ्वीराज ने कृषि विज्ञान केंद्र द्वारा चलाए जाने वाले विभिन्न तरह के कार्यक्रमों के बारे में अवगत करवाया। उन्होंने स्वरोजगार के लिए कृषि विज्ञान केंद्र द्वारा चलाए जाने वाले विभिन्न तरह के प्रशिक्षण कार्यक्रमों में भाग लेने के लिए प्रेरित किया। कार्यक्रम में ब्लॉक अबोहर-2 की 30 आंगनवाड़ी कार्यकर्त्ताओं ने भाग लेकर कार्यक्रम को सफल बनाया।

सीफेट में योग दिवस मनाया

योगाभ्यास करते हुए प्रबंधन व स्टाफ

अबोहर (धर्मवीर): कृषि विकास केंद्र व सीफेट की ओर से मंगलवार को अंतर्राष्ट्रीय योग दिवस मनाया गया। जिसमें वैज्ञानिक डॉ महेश समोया ने योग के सरीके से अवगत करवाया और स्टाफ से योग करवाया। इस मौके पर प्रभारी डॉ रमेश कुमार ने योग के फायदों के बारे में बताते हुए इसे अपनी दैनिक चर्या में शामिल करने पर बल दिया। इस मौके पर सीटीयू डॉ विनोद सहारण एसीटीयू पृथ्वीराज सहित स्टाफ के सभी ने हिस्सा लिया।



ICAR at a Glance

Makhana Stakeholders' Meet

5th September 2022, Darbhanga

Makhana has been proven to be high nutrients food which is rich in medicinal properties and good for daily health diet. The crop is a high-value commodity, commercially cultivated mainly in Mithila region of Bihar.

To give boost in this sector, ICAR-CIPHET, Ludhiana in collaboration with ICAR-Regional center on Makhana, Darbhanga organized a one-day Stakeholder's meet on Makhana here today.

Shri Sanjay Sarangi, HLA, Darbhanga, in his inaugural address, shared his experience in the area of Makhana production and processing. He urged for development of machine with higher capacity and suggested that ICAR-CIPHET should conduct some training programmes for farmers and stakeholders of Bihar.

Dr. S.N. Jha, Deputy Director General (Agricultural Engineering) presided over the event. He emphasized on the historical importance of Makhana in the development of this region. He also urged the farmers to use mechanized way of popping of Makhana for higher productivity, health of workers and income generation. Dr Jha also exhorted to organized Makhana Mahotsav on the occasion of Kojagara Festival celebrated on Sharad Purnima in Mithila region.

Shri Rajiv Roshan, IAS, District Magistrate, Darbhanga emphasized on e-marketing of processed products to national and international market.

Dr. Nachiket Kotwaliwale, Director, ICAR-CIPHET, Ludhiana, briefed about the post-harvest processing technologies of makhana and other food commodities.

Entrepreneurs, farmers and Makhana processor discussed the challenges in Makhana production and processing. It was suggested that for the development of Makhana, an active collaboration between makhana research center and ICAR-CIPHET, Ludhiana is necessary.

An emerging entrepreneur of Saurth Foundation, Madhubani Shri Shyam Babu Jha also spoke on the occasion.

Dr. M.S. Kundu, Director Extension Education, Dr R.R. Central Agril University and Dr. Ashutosh Upadhaya, Director, ICAR-Research Complex of Eastern Region, Patna also graced the occasion.

The programme was attended by Makhana growers, manual Makhana popping workers, Makhana processors and various government officials.

The event ended with vote of thanks by Dr. Indu Shekhar Singh, Principle Scientist and Head, ICAR-Regional center on Makhana, Darbhanga.

News

Knowledge Initiatives

Important Links

भारतीय कृषि अनुसंधान परिषद
Indian Council of Agricultural Research
(Ministry of Agriculture and Farmers Welfare)

Minister for Horticulture and Food Processing, Government of Punjab visits ICAR- CIPHET

9th August 2022, Ludhiana

Shri Fauja Singh Sarari, Minister for Horticulture and Food Processing, Government of Punjab visited ICAR- Central Institute of Post-Harvest Engineering and Technology, Ludhiana today. The Minister applauded the efforts of ICAR-CIPHET in the area of Processing. The Minister visited the Agro Processing Centre, Agri Business Incubation Center and interacted with few entrepreneurs promoted by the Institute. He was also appraised about the various activities of the Institute.

Shri K. A. P. Sinha, Additional Chief Secretary, Government of Punjab and Shri Rajnish Tuli, MD, Punjab Agro Industries Corporation Limited were also present during the occasion.

Dr Nachiket Kotwaliwale, Director, ICAR-CIPHET briefed about the recent activities and significant achievements of the Institute. He highlighted the technologies developed by the Institute which includes machineries, equipment, process protocols and value-added products can boost the income of farmers through processing and reducing post-harvest losses.

Shri K A P Sinha, Additional Chief Secretary, urged ICAR-CIPHET to collaborate with Punjab Agricultural University, GADVASU, Punjab State Government Departments and bankers, to transform farmers into entrepreneurs.

(Source: ICAR- Central Institute of Post-Harvest Engineering and Technology, Ludhiana)

लुधियाना भास्कर, 28/06/2022

भास्कर खास • सीफेट के माहिरों के मुताबिक गेहूं रहित खाद्य-पदार्थों की बढ़ रही डिमांड, युवा खुद का कारोबार भी कर सकते हैं स्थापित

अब खाएं ग्लूटन फ्री मक्की के मफिन और कुकीज, इसमें प्रोटीन और कार्बोहाइड्रेट के साथ लाइसीन-ट्रिप्टोफैन अमीनो एसिड भी

भास्कर न्यूज | लुधियाना

इंस्टीट्यूट ऑफ पोस्ट हार्वेस्ट इंजीनियरिंग व टेक्नोलॉजी (सीफेट) की तरफ से ग्लूटन फ्री मक्की के मफिन और कुकीज तैयार किए हैं, जोकि पोषक तत्वों से भी भरपूर हैं और ग्लूटन रहित भी हैं। गेहूं न खा सकने वाले लोग आसानी से ये उत्पाद खा सकते हैं। सीफेट की तरफ से अपनी तकनीक को प्रोत्साहित किया जा रहा है और छोटी बेकरियों भी स्थापित करने के लिए प्रेरित किया जा रहा है। वाइसचैमिस्ट्री विभाग सहसीफेट डॉ. मंजू बाला ने बताया कि ये उत्पाद सिर्फ गेहूं के उत्पाद न खा सकने वाले ही नहीं बल्कि भी खा सकता है। इनमें कई तरह के पोषक तत्व भी मौजूद हैं। उन्होंने बताया कि ट्यूबर सहय डॉ. अरुण कुमार, सूर्या तुषिर ने भी विशेष की।

मफिन में 56% कार्बोहाइड्रेट मौजूद, प्रोटीन 7% और फैट 12 %

डॉ. मंजू ने बताया कि सेलियक का इलाज नहीं है। इससे रोगी रहित खाना खाकर ही बचा जा सकता है। आईसीएमआर की रिपोर्ट के अनुसार देश में 80-90 लाख लोग सेलियक बीमारी से पीड़ित हैं। ऐसे में गेहूं, जौ इत्यादि के अलावा मक्की, चावल, ज्वार, बाजरा, रागी, मिलेट्स इत्यादि का इस्तेमाल बढ़ेगा। मक्की से तैयार ग्लूटन फ्री मफिन में 56 फीसदी कार्बोहाइड्रेट्स, प्रोटीन 7 फीसदी फैट 12 फीसदी और एदर्स व खनिज पदार्थ भी हैं, जोकि शरीर के लिए जरूरी तत्व हैं। यही नहीं इसमें लाइसीन और ट्रिप्टोफैन अमीनो एसिड भी मौजूद है। उन्होंने बताया कि मक्की से कुकीज भी तैयार किए गए हैं। इन कुकीर को पैकिंग कर 3-4 महीने तक रखा जा सकता है। उन्होंने बताया कि बेकरी का कारोबार शुरू कर रोजगार के भी अवसर जुटेंगे। 2-3 साल में छोटे स्तर की बेकरी शुरू की जा सकती है। 2024 में ग्लूटन रहित खाद्य-पदार्थ का बाजार 189 मिलियन डॉलर तक होने की संभावना है। ऐसे युवाओं के लिए स्व-रोजगार का भी साधन बन सकता है। उन्होंने बताया कि सीफेट में तकनीक भी हस्तिया की जा सकती है। इसी में स्व टेक्नोलॉजी को जोड़ने विषय विशेषज्ञ जरूरी कदमों के बारे भी सहाय किया गया है।

अमृत महोत्सव के तहत सीफेट में कोविड वैक्सीनेशन कैंप लगाया

लुधियाना| आईसीएआर- सेंट्रल इंस्टीट्यूट ऑफ पोस्ट हार्वेस्ट इंजीनियरिंग व टेक्नोलॉजी की तरफ से आजादी का अमृत महोत्सव मनाने के लिए केंद्र सरकार की नई पहल कोविड टीकाकरण अमृत महोत्सव कराया गया। इसके तहत सभी योग्य वयस्क आबादी को मुफ्त बूस्टर डोज लगाई जा रही है। दूसरी डोज लगवाने के 6 महीने बाद बूस्टर डोज लगवाई जा सकती है। इसे देखते हुए गवर्नमेंट डिस्पेंसरी अयाली खुर्द की चिकित्सा टीम की मदद से सीफेट में एहतियाती खुराक (कोविशील्ड और कोवैक्सीन) के लिए टीकाकरण शिविर का आयोजन किया गया। इस शिविर के दौरान कुल 130 लोगों का टीकाकरण किया गया। उन्होंने पहली, दूसरी और बूस्टर डोज लगवाई।

ਆਈਸੀਏਆਰ–ਸੀਫੇਟ ਨੇ ਲਾਇਆ ਟੀਕਾਕਰਨ ਕੈਂਪ

ਪਲਵਿੰਦਰ ਸਿੰਘ ਚੁੰਬੇ, ਲੁਧਿਆਣਾ

ਆਈਸੀਏਆਰ-ਸੀਫੇਟ ਵੱਲੋਂ ਸੋਮਵਾਰ ਨੂੰ ਕੋਵਿਡ ਟੀਕਾਕਰਨ ਅੰਮ੍ਰਿਤ ਮਹੋਤਸਵ ਸਮਾਰਾਮ ਕਰਵਾਇਆ ਗਿਆ। ਸਰਕਾਰ ਦੁਆਰਾ ਇਹ ਪਹਿਲਕਦਮੀ 15 ਜੁਲਾਈ ਤੋਂ 30 ਸਤੰਬਰ, 2022 ਤਕ 75 ਦਿਨਾਂ ਲਈ ਕੀਤੀ ਗਈ ਹੈ। ਸਰਕਾਰੀ ਡਿਸਪੈਂਸ ਦਿਆਲੀ ਖੁਰਦ ਦੀ ਡਾਕਟਰੀ ਟੀਮ ਦੀ ਕੈਂਪ ਦੌਰਾਨ ਕੁੱਲ 130 ਵਿਅਕਤੀਆਂ ਟੀਕਾਕਰਨ ਕੀਤਾ ਗਿਆ। ਇਸ ਕੈਂਪ 3 ਵਿਅਕਤੀਆਂ ਨੇ ਪਹਿਲੀ ਖੁਰਾਕ, ਵਿਅਕਤੀਆਂ ਨੇ ਦੂਜੀ ਖੁਰਾਕ ਅਤੇ 1 ਵਿਅਕਤੀਆਂ ਨੇ ਬੂਸਟਰ ਡੋਜ਼ ਪ੍ਰਾਪਤ ਕੀ

ਕੈਂਪ ਦੌਰਾਨ ਟੀਕਾਕਰਨ ਕਰਵਾਉਂਦੇ ਹੋਏ ਡਾ. ਆਰਕੇ ਸਿੰਘ।

https://www.cityairnews.com/content/icar-ciphet-licensed-gluten-free-maize-muffins-technology-to-whisk-journey-pvt-ltd-noida

ICAR-CIPHET Licensed Gluten-free maize muffins technology to Whisk Journey Pvt Ltd., Noida

Demand for Gluten-free food products is increasing now a day's as the patients allergic to wheat gluten and suffering from celiac disease are increasing.

City Air News Jun 21, 2022 07:46

Facebook Twitter

Ludhiana, June 21, 2022: Demand for Gluten-free food products is increasing now a day's as the patients allergic to wheat gluten and suffering from celiac disease are increasing. Patients with celiac disease could not consume wheat-based products and have to depend on other grains which are devoid of gluten proteins. So, it is a challenge to provide celiac disease patients with a variety of nutritious and healthy products. ICAR-CIPHET is committed and working consistently to meet the food needs of the nation by developing and promoting health food products. ICAR-CIPHET Ludhiana developed technologies for the development of gluten-free maize-based food products and successfully exhibited them on multiple platforms. Research team consists of Dr. Manju Bala, Dr. Arun Kumar T.V. and Surya Tushir. Noida based firm M/s Whisk Journey Pvt. Ltd. approached ICAR-CIPHET for this potential technology.