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भाकृअनुष-सीफेट  
ICAR-CIPHET

# **ICAR-CIPHET NEWS**



**ICAR-Central Institute of Post-Harvest Engineering and Technology**  
P.O. Post Office, Ludhiana -141004, Punjab  
(An ISO 9001:2015 Certified Institute)

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## From the Director's Desk

Dear stakeholder,

It is with great pleasure that I share the second quarterly newsletter of 2024, highlighting the vibrant activities and achievements of our institute over the past few months.

On the technological front, our institute continues to make significant strides. Three patents were granted to ICAR-CIPHET technologies. Our AICRP centres have developed several innovative technologies aimed at enhancing post-harvest processing and sustainability. These advancements reflect our ongoing commitment to research and development in agricultural engineering. Our dedicated team has worked tirelessly to bring these technologies from the conceptual stage to practical applications, ensuring they meet the needs of our stakeholders and contribute to the broader goals of agricultural development.



A number of extension activities- awareness programmes, trainings, exposure visits of farmers/ students were also undertaken during this period. The dedication and hard work of our scientists, staff, and collaborators are the driving forces behind these achievements. I extend my heartfelt gratitude to everyone for their unwavering commitment and contributions.

As we move forward, let us continue to innovate, collaborate, and excel in our endeavours. Together, we can make 2024 a year of remarkable progress and success for our institute and the agricultural community.

A handwritten signature in blue ink that reads "Nachiket". The signature is stylized and includes a horizontal line underneath the name.

(Nachiket Kotwaliwale)  
Director, ICAR-CIPHET

Ludhiana, 2024

**RESEARCH HIGHLIGHTS****ICAR-CIPHET*****Fish Anesthetizing and Recovery Machine***

Traditional transportation methods for live freshwater fish face significant challenges, particularly in reducing mortality rates during transit, especially without water. A project has been initiated to introduce a waterless transportation system for live fish. The proposed system aims to mitigate the drawbacks of conventional methods, reduce resource consumption, minimize environmental impact, and enhance the welfare of transported fish. The Fish Anesthetizing and Recovery Machine (FARM) is an essential component of the WLLFTS, gradually chilling fish using a thermal gradient from ambient temperature to hibernate them before transportation. An attempt was made to design and fabricate a unit of WLLFTS to cut down the cost of transportation by not using water during transportation and attempting to keep fish alive without water to fetch higher market value for transported fish. FARM was used to regulate the temperature of the fish during transportation. A water shower was provided to increase the dissolved oxygen of water for the fish.

***Desiccant Dehumidifier***

The specific requirement for storing onions in a cold store is maintaining a relative humidity between 60-70%. In an experimental storage, onions were stored without using a dehumidifier, leading to sprouting due to excessively high relative humidity. To address this issue, a desiccant-type dehumidifier was developed to regulate humidity levels and maintain optimal conditions for storing onions at low temperature. The desiccant dehumidifier has two flow passages for the regeneration air and the process air. The performance evaluation of the system has been carried out by varying the relative humidity of process air and the temperature of the regeneration air. The performance evaluation was done on its effectiveness, moisture removal capacity, and coefficient of performance.



Desiccant dehumidifier with control panel

### ***Ready-to-eat Extruded Snacks of Kodo Millet and Quinoa***

*Centre of Excellence for Millet Value Chain and Business Facilitation for Entrepreneurship, Incubation and Start-up Nurturing (under Global Centre of Excellence on Millets (Shree Anna), IIMR, Hyderabad).*

An effective way to tackle food insecurity is by providing affordable, nutrient-dense, convenient, and palatable foods that are safe for human consumption. Kodo millet and quinoa are two highly nutritious grains that are diabetic-friendly, low in calories, and can be used in the production of ready-to-eat snack items. The extrusion behavior of a mixture consisting of Kodo millet and quinoa grits was thoroughly studied using a twin-screw extruder, with the aim of optimizing the extrusion process parameters for the manufacturing of healthy expanded snacks based on kodo-quinoa. The experiments were conducted using the Box-Behnken design, with a 50-50 split of kodo and quinoa. The study found that an optimal combination of feed moisture, barrel temperature, and screw speed produced high-quality extrudates with a bulk density of 79.25 kg/m<sup>3</sup>, an expansion ratio of 4.48, and a total acceptability of 8.39. Therefore, it can be concluded that Kodo millet and quinoa can be utilized to create healthy snack options that are not only nutritious but also highly acceptable to consumers.



### ***Aonla Shreds Sugar/Spices Coating Machine***

Aonla is one of the oldest minor fruits of India and considered to be a “wonder fruit for health” because of its unique properties. At present, there is no sugar/spice coating machine for Aonla shreds. Moreover, Aonla shreds (mouth freshener) have high demand due to its good palatability and taste; as well as Aonla fruits are nutritionally sound and rich in vitamins and minerals. Therefore, based on the above needs, we have designed an equipment to mix and coat the Aonla shreds with sugar, spices, herbs etc. uniformly in a continuous manner, to develop new innovative value-added products such as Aonla mouth freshener/spices/candy/herbs. The capacity of the fabricated equipment varies from 50 to 80 kg/h.



**Hawaijar Making Machine (A traditional fermented food)**

*Hawaijar* is a traditional fermented food of North-east India made from soybean. Traditionally, it is prepared by wrapping boiled soybean in *Ficus* or banana leaves and kept in airtight under husk or straw or nearby fireplace in kitchen. The major unit operation for preparation of *hawaijar* are soaking, cooking and fermentation. This product is prepared at household level. These products serve as a source of income to many rural people, who prepare them at home and market them locally. The conventional method of *hawaijar* preparation by natural fermentation leads to variation in quality due to varying methodologies, fermentation time and temperature of incubation. The fermentation takes place under uncontrolled environmental conditions that often leads to unsuccessful fermentation and poor-quality products which might be due to native fermenting microflora. Thus, an attempt has been made to develop a mechanized system for *hawaijar* production in a controlled environment and in hygiene condition. The system can handle 10 kg capacity of raw soybean which would produce approx. 30 kg of *hawaijar* which is good enough to start an enterprise or start-up by the women folk of the region. An integrated system consisting of soaking/cooking and fermenting unit has been developed. The developed system has been improved in the 2<sup>nd</sup> prototype to ease in operation and reduce the operational hours. The changes in features of the prototype are listed below.

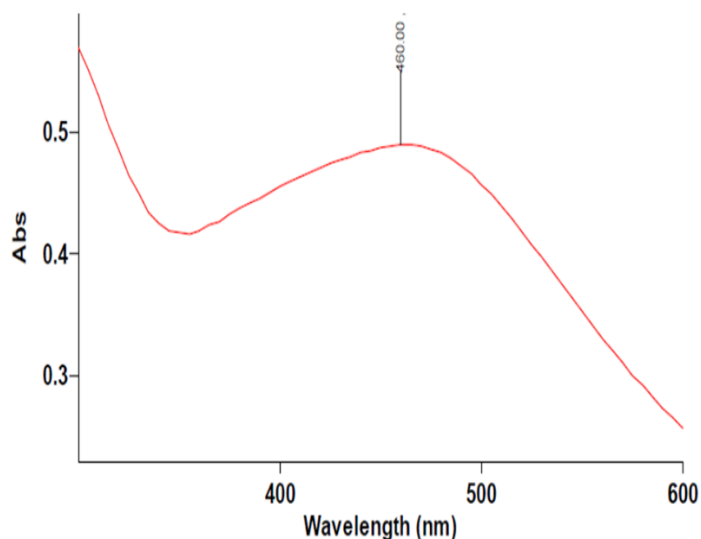


Designed Components	Prototype 1	Prototype 2	Reason
Lid Mounting/ locking system	Pin Type	Hinge Type	For easy operation
Safety Accessories	Concealed	Visible for accessibility	For safety
Analogue pressure gauge	No	Yes	For safety
Water outlet fittings	½"	1"	To reduce the time for draining water
Thickness of Inner vessel walls	2 mm	1 mm	To reduce the overall weight
Number of cookpots	2 Nos	3 Nos	To fit all the component in single unit and ease in handling
Heater power (kW)	2	4	To reduce the time for water heating

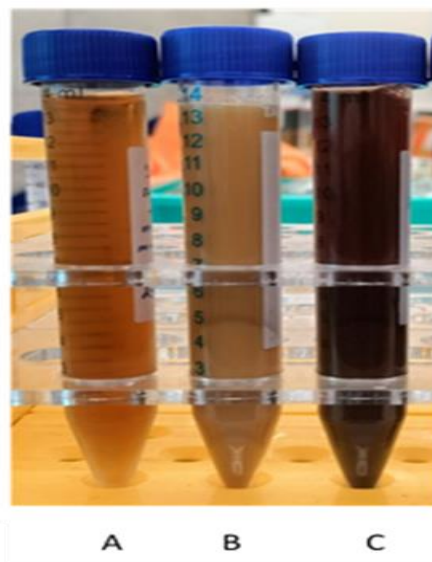
**Development of green synthesized silver nanoparticles-based phase change materials for thermal energy-storage applications**

A process protocol for green synthesis of silver nano-particles from *Moringa oleifera* leaves were optimized in a Microwave Reactor (Make: Anton Paar, Monowave 400 with autosampler type MAS24) during Professional Attachment Training (PAT) at IIT Tirupati. The novel method drastically reduced the synthesis time from 24hr using conventional heating methods to just few minutes. It was observed that the best optimized time-temperature combination for the nanoparticle synthesis was 80°C/10 min. The nanoparticles thus obtained were washed, separated and harvested using a centrifuge at 5000 rpm/10 min. UV-Vis spectrum of the synthesized nanoparticles indicated a peak at near about 460 nm, which confirmed the results, as shown below (Fig. a). The developed nano-particles (as shown in Fig. b) were used for preparation of the nano-enhanced phase change

materials (NePCM) for thermal energy storage in aqueous polyacrylate gels as a base material. Results indicated the significant reduction (up to 42%) in the super-cooling degree of the NePCM during thermal energy storage by phase-transition. The thermal conductivity was enhanced up to 27% as compared to the base materials using the developed nano-particles.



a. UV-Visible spectra of MO-AgNPs



b. (A) Moringa extract; (B) Extract mixed with base salt; (C) green synthesized silver nanoparticles

### ***Spinach Based Food Ink for 3D Food Printing***

3D food printing is an emerging technology which has gained primacy over other food processing technologies due to its potential for automation, less wastage, versatility, personalized nutrition, cost-effective customization and digital manufacturing of food into creative and complex forms. To make a food ink, the formulation and evaluation of 3D printability of food matrices is required. The present study focused on development of green leafy vegetable-based food ink for 3D food printing using spinach, hydrocolloids, corn starch, salt and spices. This work evaluated extrusion printability, rheological properties and textural properties of the developed food ink.

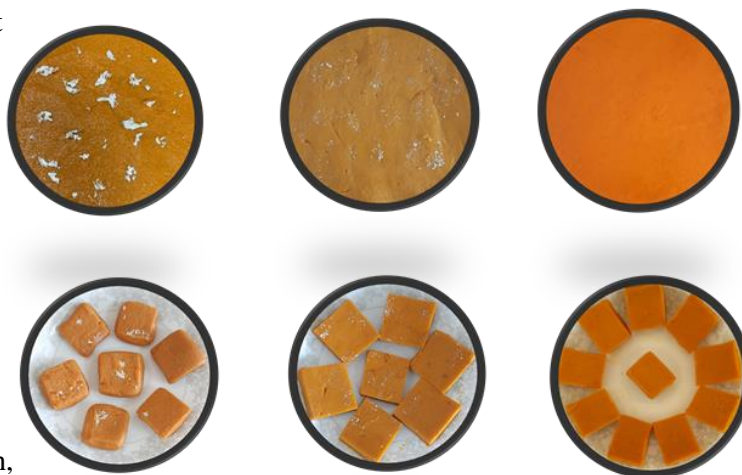


The formulation, finalized based on preliminary work, gave a stable structure and good printability with 3D food printer (Felix) upon printing with 1.6 mm diameter nozzle at printing speed of 1800 mm/min and movement speed of X/Y and Z axis of 9000 mm/min and 1000 mm/min, respectively. The dynamic viscoelastic properties (0.1-100 rad/s) and viscosity (shear rate range of 0.01-100/s) of food ink were measured using a rheometer at 25 °C with a parallel plate of 25 mm diameter and a gap of 1 mm. The results indicated a shear thinning behaviour and weak gel characteristic of food ink. The textural parameters- hardness, cohesiveness and gumminess of the food ink were recorded as 4.56 N, 0.07 and 301.20 g,

respectively. The colour attributes of the food ink were recorded in terms of L\*, a\* and b\* as 25.89, -4.21 and 10.69, respectively.

### ***Process Protocol for Production of Kinnow Burfi***

Kinnow is well-known citrus fruit ideal for its flavor, appearance, color, taste, high processing value, rich source of vitamin C, wider adaptability to various agro-climatic condition and high nutritive value. Punjab is the leading state with an average cultivation area of 59,000 hectares and a town Abohar, district Fazilka alone contributes 60% to the overall state production. The harvesting season for this fruit commences in December, and continues till March, with the peak yield observed during



January and February. Progressive kinnow farmers of Fazilka district are frequently visiting the Regional Station, ICAR-CIPHET, Abohar and informed that undersized kinnow fruits has no demand in the mandi, therefore, farmers are forced to throw the produce in nearby Highway to prevent rotting in the orchard which may otherwise cause damage to their healthy plants. Moreover, the local kinnow processing plants presently process only limited quantities of kinnow produces due to non-availabilities of protocol for diversified kinnow fruit products. However, lot of literatures are available on different value added kinnow fruit products viz., squash, juice, RTS, candy, jam etc. and these products are also commercially available. But till date there is no literatures available on process technology for production of kinnow burfi. Therefore, to minimize the post-harvest losses of kinnow fruits during the glut season, a research studies was undertaken to optimize the process protocol for production of kinnow Burfi by utilization under sized kinnow fruits. Kinnow fruits were collected from the farmers of Abohar district of Fazilka and washed with clean water. For the production of kinnow burfi, fresh pulps along with different additives were used. The maximum shelf life of 15 days and 45 days at  $25\pm 5^{\circ}\text{C}$  and  $5\pm 1^{\circ}\text{C}$  were recorded for kinnow burfi respectively for ambient and refrigerated condition along with the maximum sensory qualities. The production cost of final products was estimated in the range of Rs. 240-280.00 per kg.

### **AICRP on PEASEM**

#### ***Biofloc Fish Rearing Facility***

User-friendly biofloc fish rearing facility was designed and developed at AICRP on PEASEM, ICAR-CIFA Centre, Bhubaneswar incorporating a fish-rearing tank, mechanical settler and bioreactor. The fish culture tank is  $\text{Ø}3 \times 1.2$  m cylindrical PVC-coated polyester lining surrounded by rigid GI mesh (40 mm). The lining and the mesh are supported on eight portable FRP sectors of 3.2 m dia. with vertical support columns. The support columns are 38.1 mm PVC pipes that can be detached during transportation. The biofloc fish rearing tank of 8000 L capacity has been tested at the ICAR-CIFA farm site. The modular base design has been proven suitable for the biofloc tank's operational capacity.





### *Solar Tunnel Dryer and Drying Technology for Spices*

A solar tunnel dryer was developed by JAU, Junagadh for drying of local spices, viz., red chillies, turmeric rhizomes and ginger rhizomes having dimensions 10 m x 5 m x 2.5 m contain 64 trays of volume of 64 m<sup>3</sup> in two tiers. Developed dryer could be able to dry local spices on natural as well as forced air convection mode and results were compared with traditional sun drying method as followed by local spice growers. Solar tunnel dryer can accommodate 500 kg of fresh red chillies, 545 kg of turmeric rhizomes and 530 kg of ginger rhizomes per batch and required 11 days, 20 days, and 19 days of drying time, respectively. It maintains the high quality of dried species reduces the drying time (38-50%). Higher retention of quality parameters was obtained in natural air convection mode viz. Capsaicin content, Ascorbic acid and Anthocyanin in chillis Red Chilis, Curcumin Content, Carbohydrates and Ascorbic acid in Turmeric powder and crude oil, crude fiber, ascorbic acid in Ginger powder. It also reduces the post-harvest losses by 3.65, 1.10 and 1.0 kg /q in Red Chilis, Turmeric Rhizomes and Ginger Rhizomes, respectively, as compared to traditional sun drying method. On the basis of overall quality evaluation, higher retention of biochemical parameters were found in solar tunnel drying on natural air convection, followed by sun drying method. The total unit cost of the solar tunnel dryer is Rs. 360200 and per day total cost of Red Chilli drying was incurred of Rs 377.65.



### *Portable Scampi Hatchery*

The high cost is the major constraint in the scampi hatchery, as the structure is made of RCC. So, a cost-effective portable FRP scampi hatchery was designed, fabricated and installed in the prawn hatchery complex. The unit consists of five larval rearing tanks (LRTs) of one-tonne capacity each and one five-tonne seawater storage tank. A low-cost hatchery shed was built for the smooth operation of the hatchery. Aeration and water exchange systems were fitted to each LRT to provide continuous aeration and exchange of larval media, respectively. The grey berried prawns were collected from CIFA farm, and larvae hatching was done in 5 ppt brackish water. After hatching, the larvae were estimated and stocked in LRTs filled with 12 ppt filtered larval media.



### ***PLC-based Automation System***

A PLC-based automation system for a climate-controlled plant factory was developed by the centre. An automated system for climate control in a plant factory has been set up. A programmable Logic Controller (Delta DVP-06XA) has been used to receive external analogue signals (for parameters such as temperature, RH and carbon dioxide) and convert them into digital signals. It can handle both voltage and convert inputs into 12-bit digital data. Relative humidity and temperature are being monitored using a Temperature and humidity transmitter (HT7S11). The measuring range for temperature is 0-50°C and relative humidity is 0- 100%. It provides 4-20 mA output signal. The real time values are being monitored and displayed on 7 inches Human machine interface (DOP-107BV). User can enter threshold values and accordingly actuation is done. The data is logged every 10 minutes and can be downloaded in pen drive. Ultrasonic humidifier is being used to increase humidity level in closed structure. Whenever humidity value goes below threshold value then humidifier is turned ON to maintain required level. Air conditioner (hot & cold technology) is used to maintain desired temperature. Carbon dioxide generator is used to maintain CO<sub>2</sub> levels.



HMI display



Temp &amp; RH transmitter

Air Conditioner, CO<sub>2</sub> generator and Humidifier connected with PLC control panel

### ***Flexible Check Dam for Soil and Water Conservation***

UAS, Raichur centre has developed the flexible check dam for the conservation of water and check soil erosion. The flexible check dam is easy to construct and install at remote places using locally available materials such as clay and sand. It creates a potential water source for the benefit of farmers in rain-fed agroecosystems and provides supplemental irrigation to enhance crop productivity. The flexible dam is rectangular weir type with end contraction from both sides. The FRP of Block size (0.15 m × 0.15 m × 0.15 m) filled with excavated clay and gully-bed sand is used as the material for the construction.

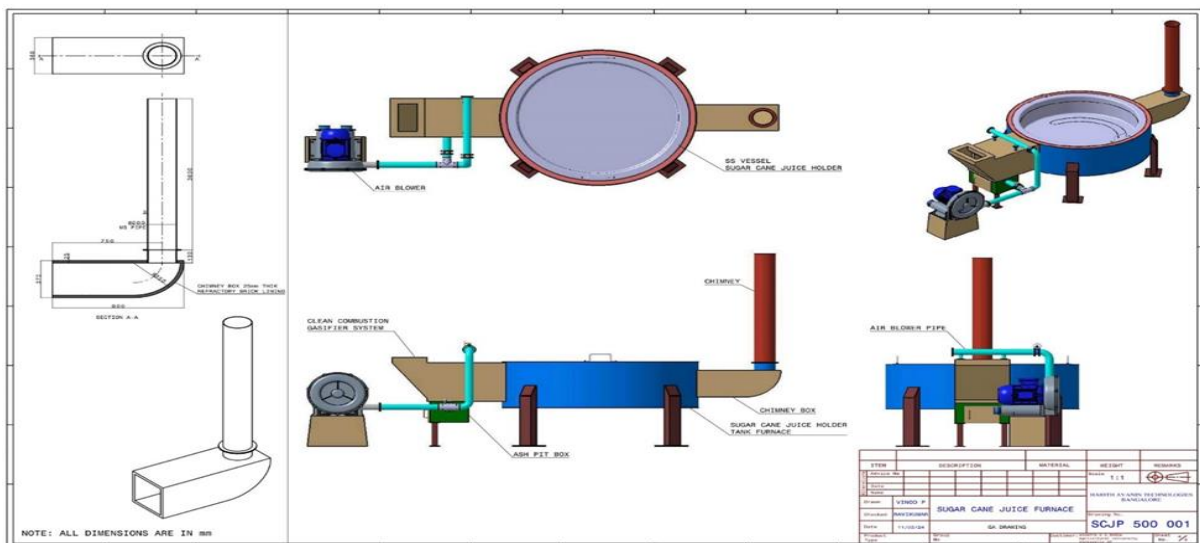
The total cost of the construction is Rs. 2, 16,500, and the cost of the water storage is 0.24 Rs. /m<sup>3</sup> (Considering the 10-year life of the check dam). The maximum water storage capacity (considering the weir is suppressed) per runoff event is 540 m<sup>3</sup>.



**AICRP on PHET**

**Biomass-based Gasifier for Production of Solid and Granular Jaggery**

The design of biomass-based gasifier has been developed by the RARS Anakapalle AICRP on PHET centre, which consist of combustion unit, holding tank and exhaust system. The fabrication and installation of unit was carried out in experiment field. The developed system can execute four batch in a day and one bath takes around 3 hrs. In one batch around 35-40 kg polish jaggery or 22-23 kg granular jaggery could be processed.



Schematic diagram of biomass gasifier continues clean combustion system and vessel holding furnace with chimney



Installation of biomass gasifier continuous clean combustion system with vessel holding furnace



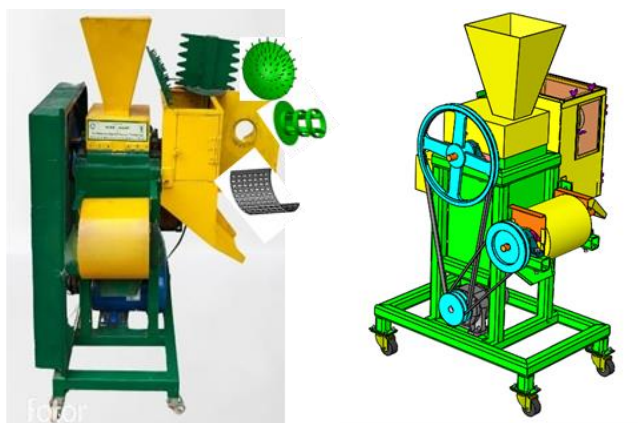
Preparation of jaggery through biomass gasifier

### ***Multi-Crop Processing Machine***

Multi-Crop Processing Machine (4-in-1 machine) was developed by UAS Bangalore centre to process groundnut, sunflower and maize. The machines overall dimensions are L×W×H (69×63×109) in cm. Threshing mechanism used in machine is comprise of Sheller, thresher, and striper with attachments. The machine was tested at different feed rates for respective crops (115-120 pods/h for groundnut, 250 maize cobs/h, and 250 sunflower ear heads/h.: the clearance was fixed at 27 mm is fixed For Groundnut decortication and Castor decortication while screens have to be changed as per pod size.

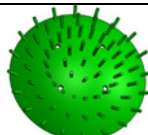


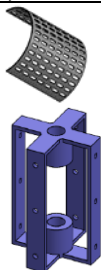
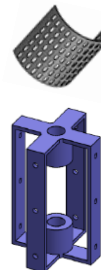
The developed 4-in-1 machine run on 1 hp single phase electric motor. In one hour, the machine separates 50 kg of pods from groundnut crop, separates seeds from 120 kg groundnut pods (<2% Breakage), separates seeds from 250 ear heads of sunflower and separates seeds from 250 maize cobs. No visual damage to groundnut pods, maize seeds and sunflower seeds was observed. Efficiency of the machine for all crops is 98%. Germination of all the seeds obtained from the machine is more than 95%.

The machine is compact, portable and easy to operate. Cost of the machine is Rs. 40,000. The machine would cost 3-4 times less as compared to the total cost of four separate machines that are required to process groundnut, sunflower and maize.

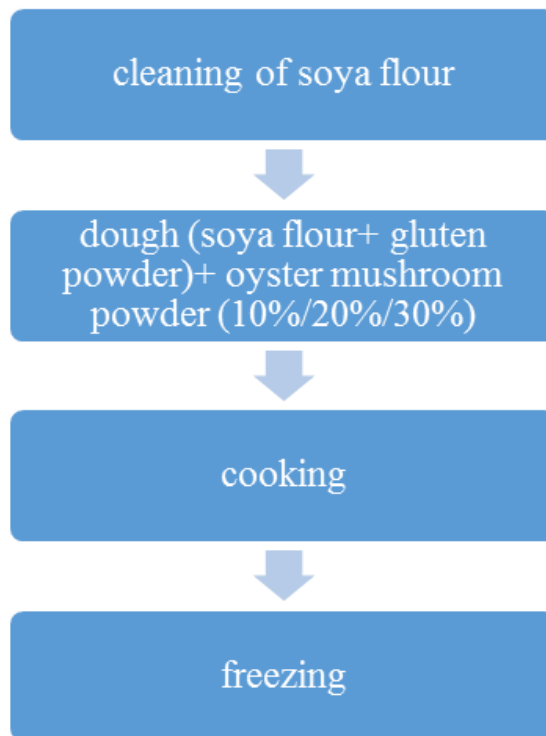


Multi-Crop Processing Machine

**Threshing mechanism and its specification:**

S.No.	Particular/ Unit operation	Attachment	Brief Specifications
1	Sunflower threshing		Disc dia =180 mm; Spikes or Peg tooth = 44 Nos; Spike dia = 4 mm; Spike L=13 mm
2	Maize shelling		L = 130 mm; Outer dia = 96 mm; Inner dia = 81 mm; No. of strip plates inside = 4 Nos
3	Groundnut pod stripper from the crop		L = 160 mm; No. of teeth's = 6+6 Nos; thickness = 2 mm sheet;
4	Groundnut decorticator		<b>Screen opening shape :</b> Oblong <b>Screen size:</b> L=280 mm; width=197 mm; <b>Screen Perforations (3 Nos) :</b> i) 8mm×25 mm; ii) 9.5mm×25 mm; iii) 10mm×25 mm <b>Screen Perforation orientation :</b> Straight <b>Rotor and rubber strips :</b> L=170; strips = 4 Nos; Strip width=25 mm; Strip thickness=10 mm (Strips : Rubber strips are embedded over iron plate of the rotor) <b>Clearance b/w screen and rotor :</b> 27 mm
5	Castor decorticator		<b>Screen opening shape :</b> Oblong <b>Screen size:</b> L=280 mm; width=197 mm; <b>Screen Perforations (Nos) :</b> i) 6.5mm×25 mm; ii) 6.0mm×25 mm <b>Screen Perforation orientation :</b> Inclination at an angle <b>Rotor and rubber strips :</b> L=170; strips = 4 Nos; Strip width=25 mm; Strip thickness=10 mm (Strips : Rubber strips are embedded over iron plate of the rotor) <b>Clearance b/w screen and rotor :</b> 27 mm

*Mock Meat:* Mock meat was prepared with wheat gluten and soya flour by OUAT, Bhubaneswar. The dough is made of soya flour + water+ gluten powder+ oyster mushroom powder. Initially dough is made with soya powder by adding wheat based gluten powder with required quantity of water, then oyster mushroom powder is added to the dough 10%, 20% and 30% by weight. Then it is cooked before freezing. The texture and sensory evaluation study is under progress.



Process flow chart for mock meat preparation



Mock meat analogue prepared from oyster mushroom powder.

***Bio-enzyme from Hill Lemon Peel***

Hill lemon peel along with other waste portion of this fruit can successfully be utilized for the production of bio-enzymes. For this, sugar: water along with constant proportion of Hill lemon peel waste for the production bio-enzyme, 15 different combinations were tried. 300 g citrus waste was processed into bio-enzyme along with different proportions of water and sugar. Glass containers and glass rod used for mixing were sterilized in an autoclave at 121°C for 15 minutes. Crushed citrus waste that includes pomace, peel and seeds was added to the pre-sterilized glass container. Baker's yeast was added @0.1% to the container and mixed with pre-sterilized rod. Moreover, for adjustment of pH, 2-5% sodium carbonate was used. Glass container mouth was sealed tightly and then kept in an incubator for fermentation at 25°C for 1 month. After a month, fermented solution was filtered using a filter paper. Among all the combinations, combination of 5:3:6 of sugar, Hill lemon waste and water at pH 3 was found best for the production of bio-enzyme with best physico-chemical attributes such as TSS, acidity, flavonoids, phenols and saponins for further utilization in cosmetic industry such as soaps. These bio-enzymes can further be utilized for cheese ripening process in future research studies.



1. Crushed Hill lemon waste



2. Incubation for 1 month at 25°C in an incubator



3. Adjustment of pH with 2-5 % sodium



4. Mixing of sugar: citrus waste: water and Baker's yeast



5. Filtration



6. Bio-enzyme

**Flow chart for the production of bio-enzyme from Hill lemon waste**



### *Cooker for Reduction of GI in Rice*

Global diabetes rates are a pressing concern, projected to double to 1.3 billion in the next 30 years, with type 2 diabetes affecting over 90% of cases, exacerbated by high glycemic index (GI) foods such as rice. Despite efforts by plant breeders, identifying low GI rice varieties remains challenging due to genetic complexities. Innovative food processing techniques like retrogradation and heat-moisture treatments show promise in reducing rice's GI by modifying starch properties. In this directions, ANGRAU, Bapatla centre has developed a multifunctional smart cooking unit with integrated heater, rapid chiller, and IoT capabilities, controlled via touch screen and PLC. This unit is capable of cooking 1 kg of rice in 45 minutes, the unit reduces glycemic index by up to 20% as validated by laboratory tests, offering significant benefits for diabetic management. With both manual and automatic controls, it represents a pivotal advancement in food technology aimed at improving health outcomes for diabetic patients worldwide. To safeguard against unauthorized replication of the fabrication work, the application for Design registration was successfully filed with the Patent Office, Government of India.

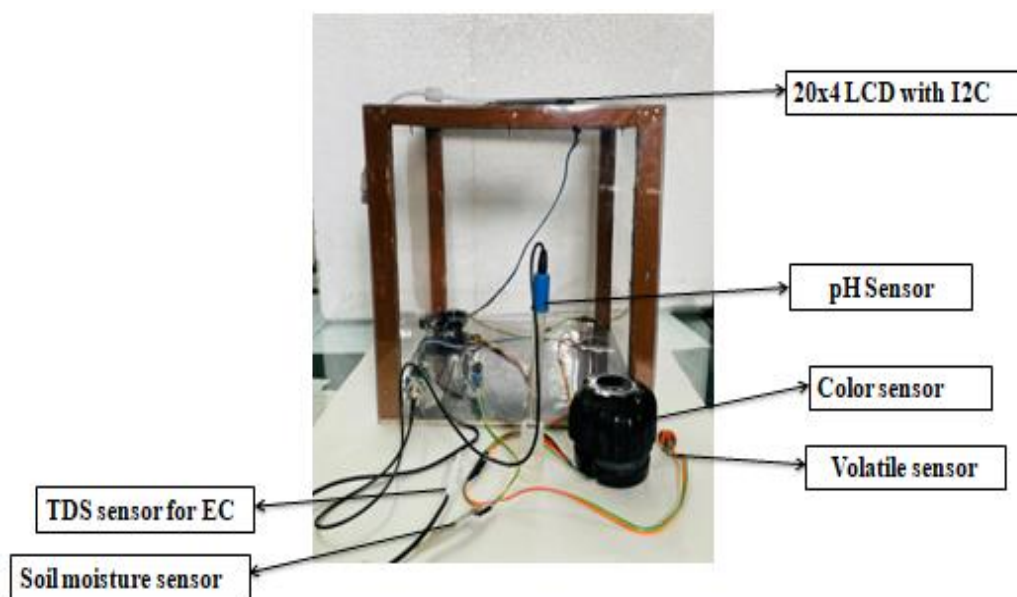


DiabLite Smart Rice Cooker

### *IoT based Honey Adulteration Detection Analyzer using machine learning*

The system was developed for honey quality analysis using a combination of five sensors that measure various physicochemical parameters. These sensors include the TC 3200 for colour, pH sensor for pH, TDS sensor for electrical conductivity, soil moisture sensor for moisture content, and the TGS 822 FIGARO sensor for volatile compound detection (specifically HMF).

The developed system can classify honey samples as either pure or adulterated within predefined ranges. The TC 3200 sensor in the developed system initially provided RGB colour output, subsequently converted into Lab colour space.



On the other hand, the TGS 822 FIGARO sensor operates independently, providing voltage responses that facilitate the detection of HMF content in both pure and adulterated honey samples.

*Food from Slaughter House Waste and Spent Hen Meat*

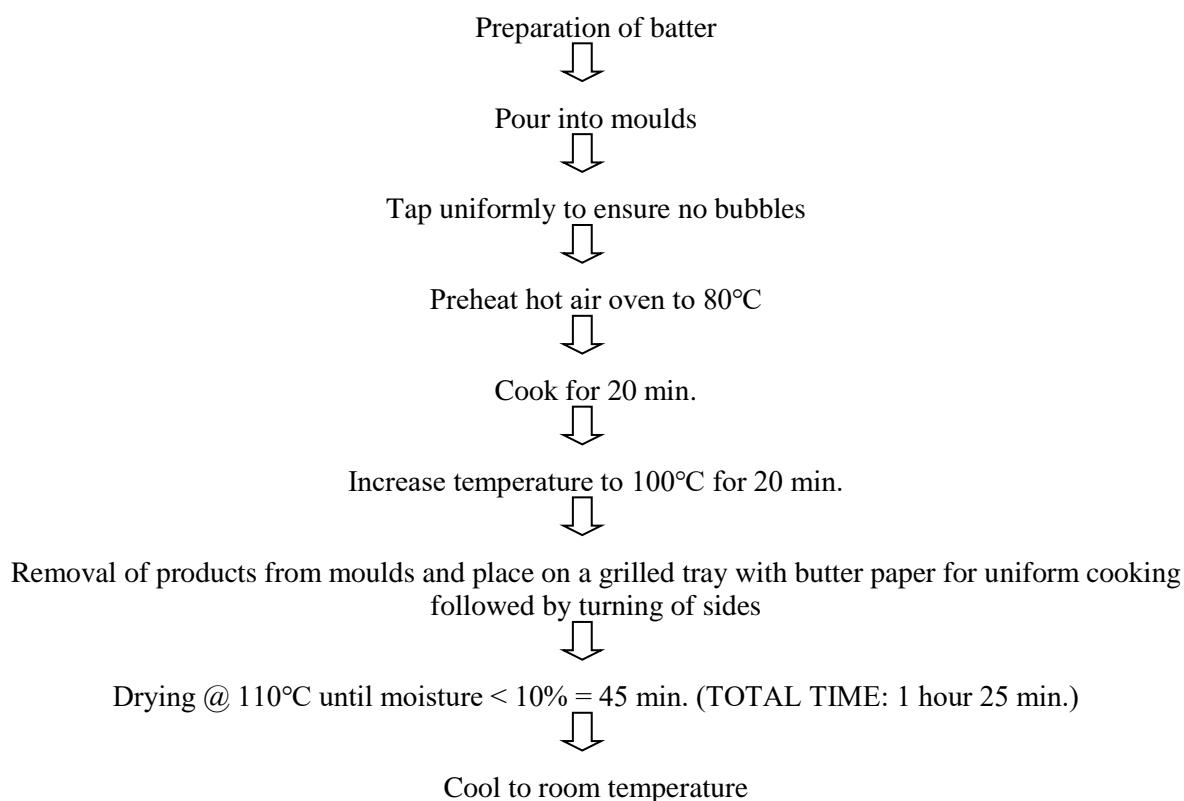


Standardized kibbles as prepared with the above-mentioned protocol

Nutritional assessment of the developed product is as follows:

Parameter	Nutritional %
Moisture	4.76
Protein	49.53
Ash	4.37

The Process flowchart is as below:



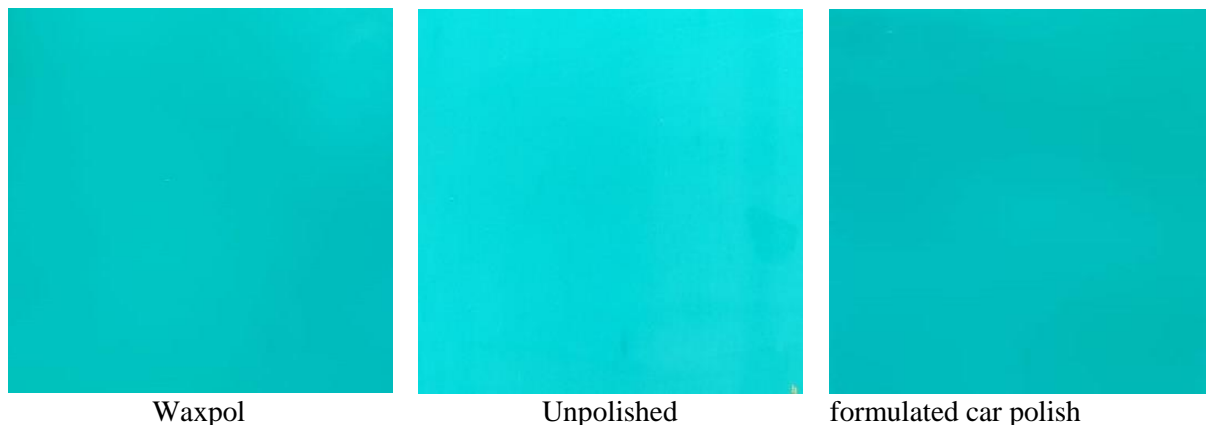
### ***Process Technology for Making Car Polish from Karanj Oil***

Karanj oil was used for making metal polish. Metal polish is used for polishing metal surface to increase shine and making attractive. The materials used for development of polish are karanj oil (6 g), Span-20 (6 g), abrasive powder (1g), Alphox-200 (12g) and distilled water (75 g).



Photograph of car polish

The developed polish and polish available in the market (Waxpol) were applied on the metal sheet. The photographs of unpolished surface and polished using formulated polish and Waxpol are given below:



The value of pH and total solid of the developed polish were found to be 5.9 and 15.3 respectively. Gloss was measured using gloss meter on unpolished metal surface, polished surface with Waxpol and formulated polish. The average gloss value was found to be 15.12 GU (unpolished surface), 42.89 GU (surface polished by Waxpol) and 48.88GU (surface polished by formulated polish) respectively.

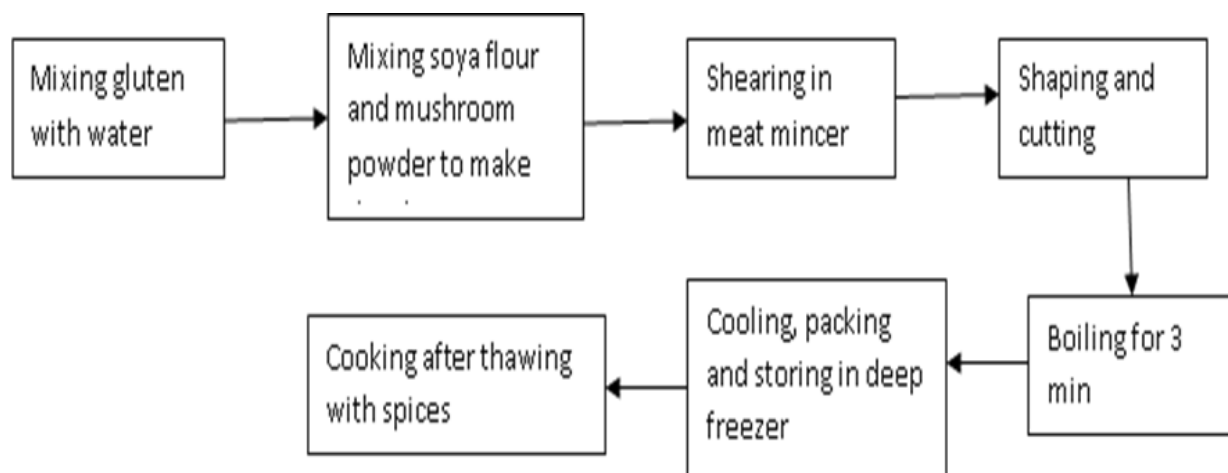
#### ***Texturized mushroom protein from oyster mushroom***

***Extruded Products:*** The texturized mushroom protein is made from oyster mushroom powder. Hot extrusion method is used with ratio of 10% oyster mushroom powder with defatted soya flour at temperature range of 70 and 90°C. The operating parameters 35% moisture content and 300 rpm screw speed resulted in better product. Higher moisture content resulted in darker color of the product, it was also observed that, higher mushroom content resulted in shoot out from the die outlet due to high fiber content of mushroom powder. Increase in moisture content resulted in higher expansion and expansion is restricted upon addition of mushroom powder. Gives rubbery texture and retain its structure after hot water cooking.



Extruded product from 90% defatted soya flour and 10% mushroom powder at 25, 35 and 45% moisture content (First figure is from 100% defatted soya flour)

*Mock Meat*: Mock meat was prepared by mixing wheat gluten, soya flour and mushroom powder in the ratio of 4:4:1 and making dough with addition of water followed by shearing in a meat mincer, boiling in water for 3 min and storing in deep freezer at -18°C. With addition of mushroom powder, the colour became darker and colour change was 6.77 from pure soya flour mock meat.



## PUBLICATIONS

### *Research Publications*

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- Indore, N. S., Karunakaran, C., Jayas, D. S. et al. (2024) Characterization of spring and durum wheat using non-destructive synchrotron phase contrast X-ray microtomography during storage. *npj Science of Food* 8, 29.
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effects of genotype, environment and their interaction on quality attributes of diverse wheat (*Triticum aestivum* L.) genotypes. *Indian Journal of Genetics and Plant Breeding*, 84(02):156–167.

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- Dubey, A., Mani, I., Routray, W., Nebapure, S. M., & Parray, R. A. (2024). Evaluating bag storage technologies for physical characteristics, loss reduction and economic viability in pulses. *Journal of Stored Products Research*, 107, 102339.
- Sharma, S., Singh, P., Gupta, N., Utreja, D., & Kasana R. C. (2024). Bacterial diversity and enzymatic activities in poplar chronosequence: Implications for soil carbon dynamics in a semi-arid ecosystem. *Forest Ecology and Management*. 562, 121933.

### Training manuals including all kinds of manuals

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- Bidyalakshmi, Th., Kaukab, S., Dawange, S. P., Guru P. N., Vishwakarma, R. K., Kotwaliwale, N., Sharma, M. and Zalpouri, R. (2024). Sample Analysis Procedures: Tools and Techniques for Selected Pulses. Technical Bulletin. ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana, Punjab. pp-42.
- Amit Nath, Arvind Kumar Ahlawat, Rupender Kaur, Mahesh Kumar Samota and Shilpa S Selvan (2024). A training manual on “Processing and value addition of fruits and vegetables” was prepared and handed over to trainees during (10-15 June 2024) a training program under SCSP Scheme held at Regional Station, ICAR-CIPHET, Abohar, Punjab. Pages 1-67.
- स्वाति सेठी, मंजू बाला, सूर्या तुषीर , गुरजीत कौर, रमनदीप सिंह (2024) चयनित फसलों से अचार के प्रसंस्करण, परीक्षण और गुणवत्ता आश्वासन पर प्रशिक्षण पुस्तिका। छत्तीसगढ़ राज्य के वन उपज के प्रसंस्करण और मूल्य संवर्धन पर अनुसंधान, विकास और क्षमता निर्माण गतिविधियाँ” पर सहयोगी परियोजना के तहत । पृष्ठ 1-111.
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- Chanu, S. N., Bidyalakshmi, Th., Gairola, K., Raleng, A., & Chingsubam J. (2024). Biofertilizers: Its Role in Soil Fertility and Sustainable Agriculture. *Agritech Today*. 2 (3): 8-10.
- Selvan, S. S., Samota, M. K., Nath, A., Ahlawat, A. (2024). Bioplastics: Innovations Shaping the Future of Packaging, *Food Info Tech*, 1(4), 44-45.
- Singh, R., Vishwakarma, R. K., Jha, S. N., Kaur, N., & Singh, V. (2024). Establishment and commissioning of makhana pilot plant. *Modern Kheti* (Punjabi) 36 (2): 23-24.

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- Choudhary, P. & Mann, S. (2024). Food Quality and Safety. In: Training manual on Capacity building of agricultural extension professionals of ATARI Zone-VII and X to promote agro-processing (Balakrishnan R., Bembem, K. and Kumar V. Eds) ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana.
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### Books

- Pal, S., Kiran, R., Mishra, N., Kaur, R., Suneetha, T. B., Gupta, S., & Hasan, W. (2024). Food Processing Technologies Print. Print ISBN: 978-93-61347-64-1 ebook ISBN: 978-93-61344-88-6, pp-1-240.

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- Kaukab, S., Mishra, A., Devi, T.S., Devi, T. B. and Pahariya, P. (2024). Application of Lights in Food Safety. *Futuristic Trends in Agriculture Engineering & Food Sciences* (pp. 96-117). IIP Series. e-ISBN: 978-93-5747-515-0.
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- Pradhan, N. C., Naik, M. A., Chowdhury, M., Kushwah, A., Asha, K. R., Dhar, T., Gavhane, K.P., Urhe, S. B. and Satpute, A. N., (2024). Robotic Seeding or Sowing System in Smart Agriculture. In *Artificial Intelligence and Smart Agriculture: Technology and Applications* (pp. 495-520). Singapore: Springer Nature Singapore.
- Rout, R. K., Kumar, A., Sivamma, P., Prakash, R., Kukde, R. B., Misra, S., Rao, S. P., Naik, R., Ravindra M. R., Murthy, G. R. K., Avinashilingam, N. A. V., Yashavanth, B. S., Rao, & C. S. (2024). Role of Agro-Processing towards Climate Resilience in Agriculture. In: *Research and Technological Advances for Resilient Agriculture*. Publisher: ICAR- National Academy of Agricultural Research Management, Hyderabad, India. Pp. 205-244. ISBN No: 978-93-340-3808-8
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### Test reports

- Confidential test report for the consultancy project "Performance Evaluation (Test Protocol) of RGB camera and AI & Mobile based Grain Analyser (EASY 360). June 2024." Thingujam Bidyalakshmi, Bhupendra M Ghodki, R.K. Vishwakarma and Nachiket Kotwaliwale. 2024. Performance Evaluation (Test Protocol) of RGB camera and AI & Mobile based Grain Analyser (EASY 360). ICAR-CIPHET, Ludhiana. pp 1-87.

## PATENTS AND TECHNOLOGIES

### Patents:

S.No.	Title	Application No.	Inventors	Date of grant/filing	Patent Number
1.	Process for producing low-fat, high-fibre processed meat products using food industry by-	201911049376	Dr. Yogesh Kumar, Dr.K. Narsaiah, Dr. R.K. Singh Dr. Sandeep Mann Dr. R.K. Vishwakarma	02.04.24	531519



	products				
2.	Cool Tower For Production Of Microcapsules From High Melting Fats And Waxes	202111014302	Dr. K. Narsaiah	23.04.2024	534205
3.	Process for preparation of rose petal jam	202011021332	Dr. Mridula D. Dr. Deepika Goswami Dr. R K Vishwakarma Er. A A Bashir Dr. Indore Navnath Sakharam Dr. R K Singh	27.05.2024	539375
4.	Compact Moisture Reduction Unit For Honey	202411033338	Dr. Sandeep Mann Dr. Renu Balakrishnan	26.04.2024	-
5.	Table-top vacuum fryer	202411038348	Dr. Swati Sethi Dr. Pankaj Kumar	16.05.2024	-

**Copyright:**

S.No.	Title	Registration No.	Date of registration	Authors
1	भा. कृ. अनु. प.- सीफेट के मार्गदर्शन एवं तकनीकी सहयोग से सफल कुछ उद्यमी	CF-5668/2024	10.5.2024	1. Alka Sharma 2. Deep Narayan Yadav 3. Guru P.N 4. Shyam Narayan Jha 5. Jaspreet Singh 6. Kh. Bembem 7. Nachiket Kotwaliwale 8. Rahul Kumar Anurag 9. R.K. Vishwakarma 10. Ranjeet Singh, 11. Renu Balakrishnan, 12. Rupinder Kaur 13. Sachin Mittal 14. Sandeep Mann
2.	Bha.Kri.Anu.P.- CIPHET द्वारा विकसित makhana prasanskarana pradyoyogikiya "(भा. कृ. अनु. प. - सीफेट द्वारा विकसित मखाना प्रसंस्करण प्रौद्योगिकियाँ)	Diary No. 17110/2024-CO/CF	28.05.2024	1. Deep Narayan Yadav 2. Guru P.N. 3. Indu Shekhar Singh 4. Khwairakpam Bembem 5. Mridula Devi 6. Nachiket Kotwaliwale 7. Rajesh Kumar Vishwakarma 8. Ranjeet Singh 9. Renu Balakrishnan 10. Shyam Narayan Jha

*Design registration:*

S. No.	Title	Design No.	Date of application	Inventors
1	Photocatalytic reactor for Ethylene degradation	411658-001	16.05.2024	Dr. Bhupendra M Ghodki Dr. Poonam Choudhary

*Transfer of Technology:*

S.No.	Title	Licensee/ Firm	Licensing fee (Rs)	Date of licensing
1	Visible light insect trap	M/s Parashar Agrotech Bio Pvt Ltd. Varanasi - 221002	2.5 lakh + GST	28.03.24
2	Process for preparation of fat free flavoured makhana	M/s Britwell Foods & Beverage Private Limited, #102, Shankar Sadan Apartment, Nearby GS Neuroscience Clinic & Research Centre, New Patliputra Colony, Patna-800013	25000	23.04.24
3	Cereal-gluten free pasta with semi-popped makhana	M/s Britwell Foods & Beverage Private Limited, #102, Shankar Sadan Apartment, Nearby GS Neuroscience Clinic & Research Centre, New Patliputra Colony, Patna-800013	25000	24.04.24
4	Ready to constitute makhana kheer mix	M/s Britwell Foods & Beverage Private Limited, #102, Shankar Sadan Apartment, Nearby GS Neuroscience Clinic & Research Centre, New Patliputra Colony, Patna-800013	50000	25.04.24
5	Pearl millet based composite extrudates	Mr. Navjot Singh, Ropar, Punjab	50,000 + GST	10.06.24

**EXTENSION ACTIVITIES***Technology demonstrations/ FLDs/ OFTs*

S. No.	Technologies	Demonstrated at	Date	Occasion
1.	Processing of soybean for soy milk and tofu	ICAR-CIPHET	18.03.24	Farmers Training
2.	Processing and value addition of green chilli for puree and paste	ICAR-CIPHET	19.03.24	Farmers Training
3.	Fish Anaesthetizing and Recovery Machine (FARM) model	ICAR-CIPHET	11.04.24	Before RAC members
4.	Field day on oil seeds	Bahawal bassi, Abohar	21.03.24	To show new technologies in oil seeds production
5.	Field day on oil seeds	Raipura, Abohar	26.03.24	To show new technologies in oil seeds production
6.	Field day on Pulses	Wariyam Kheda,	28.03.24	To show new technologies in

		Abohar		Pulses production
7.	CRM Harvest Day	Khippan Wali, Abohar	12.04.24	Harvest day
8.	CRM Harvest Day	Khui Khera, Abohar	12.04.24	Harvest day
9.	Processing of fruits and vegetables	KVK Fazilka	24.04.24	Students workshop cum visit
10.	X-ray system (facility developed)	ICAR-CIPHET	15.04.24	Demonstration to Dr. Dharmendra Saraswat, Professor, Purdue University and Dr. Santosh Kumar Pitla, Professor, University of Nebraska Lincoln
11.	Moisture meter	ICAR-CIPHET	22.04.24; 07.05.24	Demonstrated to the team members of ICAR-CIAE DoCA project and ICAR-IIPR Kanpur
12.	Visit of Technicians (T1 different labs of AS & EC Division)	ICAR-CIPHET	15.05.24	Orientation program
13.	Spice grinding	ICAR-CIPHET, Ludhiana	16.05.24	Practical session for SCSP trainees from CSSRI, Karnal

*Stakeholder/ officer/ farmer/ exposure visits*

S.No.	Address of visitors	Number of visitors	Date
1.	VSCG University of Horticulture and Forestry, Uttarakhand	28	02.04.24
2.	Exposure visit of APC	5	15.04.24
3.	Exposure visits of SHG trainees from Chhattisgarh at KVK Abohar	10	27.04.24
4.	Exposure visits of students from school	44	24.04.24
5.	Visit to sugarcane farmer (Ghallu)	02	09.05.24
6.	College of Community Sciences, Tura, Meghalaya, Central Agricultural University	16	03.05.24
7.	Visit to farmers field at Village Bazidpura Kattiawali	3	16.05.24
8.	Visit to farmers field for Maize CFLD at Khippa wali & Bazidpura for Basic survey data collection	2	20.05.24
9.	Visit to farmers field for Maize CFLD at Nihal Khera for Basic survey data collection	3	21.05.24
10.	Visit to farmers field for Maize CFLD at Kathera and Ghallu	3	03.06.24
11.	Visit to Farmers for SCSP Training at Bakain wala	2	04.06.24
12.	Visit to Taja Patti for DSR	3	06.06.24
13.	CSA Agriculture University, Meerut (UP)	25	06.06.24
14.	Visit to Punjab Agro Plant, Alamgarh	35	12.06.24
15.	Visit to farmers field for DSR at Dharang Wala	5	13.06.24
16.	Entrepreneurs from the food processing industry, Chandigarh	05	13.06.24
17.	Visit to farmers field for DSR at Roohreya Wali	4	14.06.24
18.	Visit to Punjab Agro Plant, Alamgarh	33	15.06.24
19.	IGKV, Raipur	26	15.06.24

*Awareness programmes*

S.No.	Programme title	Venue	Duration	Beneficiaries
1	Awareness cum training program on oilseeds	Ramsara, Abohar	16.03.24	70
2	Mera Gaon Mera Gaurav	Malakpur Ludhiana	28.06.24	20

**HUMAN RESOURCE DEVELOPMENT AND CAPACITY BUILDING***Human resource development*

S. No.	Training title	Venue	Participants	Duration
1.	Student training on Post-Harvest management processing of horticulture crops	ICAR-CIPHET, RS, Abohar	01	11 March-10 April, 2024
2.	Post-harvest management of Agricultural Produce	ICAR-CIPHET, Ludhiana	26	18-22 March, 2024
3.	Advanced Microbiological and Biochemical Techniques for Improving the Analytical & Technical Skill of Post Graduate Students (Sponsored by SERB)	ICAR-CIPHET, Ludhiana	25	18-27 March 2024
4.	Agribusiness and Entrepreneurship Development Program through Agro-Processing (All women)	Banmajra Morinda Village	60	26.04.24
5.	Processing, testing and quality assurance of pickles from selected crops” under collaborative project on “Research, Development & Capacity Building activities on processing & value addition of forest produce of Chhattisgarh state.	ICAR-CIPHET, Ludhiana	08	22-28 April 2024
6.	Production techniques of Summer Vegetables	KVK Fazilka	25	19.04.24
7.	Student internship programme (GADVASU, Ludhiana)	ICAR-CIPHET, Ludhiana	03	02 May -30 June 2024
8.	Bakery training program to empower farm women	Abiana, Nurpur Bedi, Roopnagar	110	10.05.24
9.	Carbon Auditing of Agricultural and Allied Systems Activities	ICAR CIPHET Ludhiana	26	21-23 May 2024
10.	“Processing and value addition of fruits and vegetables” for SC farm women under SCSP Scheme	Regional Station, CIPHET, Abohar	60	10-15 June 24
11.	Internship programme	ICAR CIPHET Ludhiana	03	02 May - 30 June 2024

12.	Hands on training on “Sample Analysis Procedures: Tools and techniques for Selected Pulses”	ICAR-CIPHET, Ludhiana	17	5-7 June 2024
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### *Skill Development:*

S. No.	Staff name	Title of the programme	Venue	Duration	Dates
1.	Ms. Soumya Mohapatra	Online training program on “Current methodologies for water footprint estimation and techniques for water saving”	ICAR-IIWM, Bhubaneswar (Online)	3 days	18-20 March, 2024
2.	Dr. Pankaj Kumar	Application of robotics and AI in food quality	ICAR-CIPHET Ludhiana	2 days	15-16 April 2024
3.	Ms. Ritu Kukde	Professional Attachment training on “Industrial automation 4.0 with IIOT	VNIT, Nagpur, Maharashtra	3 Months	1 February to 11 May 2024
4.	Ms. Soumya Mohapatra, Dr. Pankaj Kumar, Dr. Indore Navnath, Er. Sumit Urhe, Dr. Abhinav Dubey Dr. Shilpa S Selvan	Carbon Auditing of Agricultural and Allied Systems Activities	ICAR-CIPHET Ludhiana	3 days	21- 23 May 2024

### *Awards/ Recognition*

S.No.	Name of Awardee	Name of Award	Awarded by
1	Er. Sumit Urhe	Best Poster Presentation	National Symposia on Food Processing 4.0: Innovation and Sustainability held on 30/04/2024 at Department of Food Science & Technology, Punjab Agricultural University, Ludhiana.
2	Dr. Chandan Solanki	Best Oral Presentation	National Symposia on Food Processing 4.0: Innovation and Sustainability held on 30/04/2024 at Department of Food Science & Technology, Punjab Agricultural University, Ludhiana.
3	Dr. Chandan Solanki	Best Article Award	Agriculture and Food e-Newsletter.
4.	Dr. Abinav Dubey Dr. Sandeep Mann	Best Poster Presentation	National Symposia on Food Processing 4.0: Innovation and Sustainability held on 30/04/2024 at Department of Food Science & Technology, Punjab Agricultural University, Ludhiana.

*Lecture delivered*

<b>Name of official</b>	<b>Title of the lecture</b>	<b>Programme</b>	<b>Venue</b>	<b>Date</b>
Dr. Arvind Kumar Ahlawat (Head, KVK)	KVK activities and new initiatives taken by KVK, Fazilka (Abohar)	Awareness cum training program on oilseeds scheme	Ramsara	16.03.24
Sh. Rajesh Kumar	Latest developments in oil seeds production.	Awareness cum training program on oilseeds scheme	Ramsara	16.03.24
Dr. Rupinder Kaur SMS Home Science	Lecture cum method demonstrations on Procedure of making pickle masala and precautions during pickle making	SHG Trainees from CIPHET Ludhiana	KVK, Abohar	27.04.24
Dr. K. Bembem	Capacity Building of Farmwomen in Homestead Technologies	SCSP Programme	ICAR-CSSRI, Karnal	14.05.24
Dr. Abhinav Dubey	Attended as a keynote speaker “Revolutionizing Indian Agricultural Engineering Technologies at 2047”	National conference on multidisciplinary research and innovations	NCMRI-Baba Fardid college at, Bhatinda	18.04.24
Dr. Sandeep Mann	Advancements on packaging materials, mechanization techniques for pickle packaging during training on “Processing, testing, and quality assurance of pickles from selected crops	Training	ICAR-CIPHET	24.04.24
Dr. Sandeep Mann	Attended as a keynote speaker “Transforming traditional food through AI and IoT”	National Symposium on food Processing 4.0: Innovation & Sustainability	PAU, Ludhiana	30.04.24
Dr. Thingujam Bidyalakshmi	Experiment for EMC study	Hands on training under DoCA Project	Committee room, ICAR-CIPHET	6.06.24
Dr. Thingujam Bidyalakshmi	Processing and value addition of ginger and turmeric	Capacity building of agricultural extension professionals of ATARI Zone-VII and X to promote agro-processing	Conference hall-I and APC	26.06.24

Dr. Poonam	Food quality, safety, standards, and procedures	Capacity building of agricultural extension professionals of ATARI Zone-VII and X to promote agro-processing	ICAR-CIPHET, Ludhiana	25.06.24
Dr. Sandeep Mann	“Processing and value addition of sugarcane (L)”	Training	ICAR-CIPHET	24.06.24
Dr. Sandeep Mann	“Processing and value addition of pulses (L)”	Training	ICAR-CIPHET	26.06.24
Dr. Sandeep Mann	“Identification of equipment and designing a model APC for KVK”	Training	ICAR-CIPHET	28.06.24
Dr. Sandeep Mann	“Entrepreneurship development through agricultural processing”	Resource person (Instituted Lecture)	Sher-e-Kashmir University of Agricultural processing	08.07.24

*Participation in conference/ seminar/ symposia/ workshop/ meetings, etc.*

Name of official	Title of the programme	Organised by	Date
Dr. Amit Nath Head, RS, ICAR-CIPHET, Abohar	Fruit, Vegetables, and allied products sectional committee	Hydrid (BIS HQ, New Delhi)	20.03.24
Dr. Ramesh Kumar, Pr. Scientist	Fruit, Vegetables, and allied products sectional committee	Hydrid (BIS HQ, New Delhi)	20.03.24
Dr Renu Balakrishnan, Dr Sandeep Mann Ms. Soumya Mohapatra Dr. Rajiv Sharma,	Annual Review meeting under Farmers First Project	ICAR-ATARI Zone I, Ludhiana	29.04.24
Dr. Arvind Kumar Ahlawat	DSR Workshop	KVK, ICAR-NDRI, Karnal	30.04.24
Dr. Ravi Prakash	Training programme for on boarding of new Technical Committee members FAD-33 memebrrs	BIS	29-30 April 2024
Er. Urhe Sumit Bhausheb Dr. Chandan Solanki Dr. Rahul Kumar Anurag Dr. Abhinav Dubey	National Symposia on Food Processing 4.0: Innovation and Sustainability on 30/04/2024	Department of Food Science & Technology, Punjab Agricultural University, Ludhiana	30.04.24

Dr Ramesh Kumar, Pr. Scientist	FAD-10 working group meeting of BIS	IIHR, Bangalore	02.05.24
Dr Pankaj Kumar	Fourth meeting of FAD 16/Panel II/Working Group I	Hybrid Mode	03.05.24
Dr. Rupinder Kaur SMS Home Science	Action Plan Workshop	ICAR-ATARI, Ludhiana	06.05.24
Dr. Rupinder Kaur SMS Home Science	One-day Workshop	ICAR-CRIDA	07.05.24
Dr. Nachiket Kotwaliwale Dr. R. K. Vishwakarma Dr. Thingujam Bidyalakshmi Dr. Guru PN Er. Shaghaf Kaukab Dr. Sandeep Dawange Dr. Sandeep Mann	National Steering Committee (NSC) meeting	ICAR-IIPR Kanpur (UP)	6-7 May 2024
Dr. Shrikrishna Nishani	Workshop on IoT and AI in Agriculture	ICAR- CIPHET	15-16 April 2024
Dr. Poonam Dr Ramesh Kasana	Sectional Committee: FAD 23-Biotechnology for food and agriculture	Online (BIS Manak Bhawan)	14.05.24
Dr. Manju Bala & Dr. Swati Sethi	BIS Technical committee meeting	On line	22.05.24
Dr. Deepika Goswami	BIS Technical committee meeting	Online (BIS Manak Bhawan)	13.06.24
Dr. Amit Nath	Scientist-Farmers interaction meeting along Students and SHG of FPO	Tatiya university, Sri Ganganagar in collaboration with KISSAN GURUKUL	04.06.24
Dr. Sandeep Dawange	DoCA Training programme	ICAR-CIPHET	05-07 June 2024
Dr. Ravi Prakash	FAD 33 Sectional Committee second Meeting (online)	Bureau of Indian Standards (BIS Manak Bhawan)	29.05.24

### *Personalia*

#### **Promotion and new joining**

- Sh.Rajinder Kumar Raheja,UDC has been promoted to the post of Assistant.
- Sh.Ajay Kumar, LDC has been promoted to the post of Upper Division Clerk (UDC).
- Ms. Anuradha, Administrative Officer joined on 22.04.2024
- Sh. Anupam Kumar Chaudhary, Technical Trainee joined on 03.05.2024
- Sh. Gautam Kumar, Technical Trainee joined on 06.05.2024



### IMPORTANT EVENTS

- ICAR-CIPHET, Ludhiana submitted the QRT report 2017-22 to DG-ICAR.
- 26<sup>th</sup> Meeting of Research Advisory Committee (RAC) was held during 10-11 April 2024 under the Chairmanship of Dr. R.C. Maheshwari. All scientific staff attended this meeting.
- ICAR-CIPHET, Abohar celebrated World Water Day on 22<sup>nd</sup> March 2024 with 75 students of Dashmesh Girls College, Badal, Distt Shri Mukatsar Sahib.
- Cooperative Conference with collaboration of KRIBHCO during 08.05.2024.



- To strengthen Indo-Dutch Collaboration in Post-Harvest Processing, the ICAR-CIPHET recently hosted Mr. K R Jain, the Indian representative of PUM Netherlands Senior Experts NGO. During his visit, Mr. Jain engaged in productive discussions with Dr. Nachiket Kotwaliwale, Director ICAR-CIPHET, Ludhiana, Dr. Ranjeet Singh, Head ToT Division, and scientists from ICAR-CIPHET, Ludhiana. These discussions focused on knowledge exchange and exploring avenues for Expert lectures, capacity building and others development projects for FPO's, FBBO,s SHGs and Farmers group. Through this collaboration, both parties aim to improve the efficiency, sustainability, and quality of post-harvest processes, thereby contributing to food security and economic growth of the farmers in the region.



- Training programme for “Carbon auditing of agricultural and allied systems activities” was organised by Coordinating unit on 21-23 May 2024 at ICAR-CIPHET, Ludhiana. Total 26 participants from various AICRP on PEASEM centres and ICAR CIPHET, Ludhiana participated and successfully completed the training.
- ICAR-CIPHET, Ludhiana/Abohar Organized a one-week-long awareness/campaign program on mission LiFE aligned with the theme of World Environment Day 2024 “Land Restoration, Desertification and Draught Resilience” from May, 27 - June 5, 2024.
- 35<sup>th</sup> IRC meeting held during 4-5 June, 2024 at ICAR-CIPHET, Ludhiana.
- Celebration of Environment Day on 4<sup>th</sup> June 2024 at RS, CIPHET, Abohar.

**MEDIA COVERAGE**



**केवीके/सीफेट की ओर से फसल दिवस मनाया**



सीफेट/केवीके के अधिकारी व किसान।

**सवेरा न्यूज़/धर्मवीर अबोहर :** कृषि विज्ञान केंद्र सीफेट अबोहर द्वारा राघपुरा गांव में समूह अग्रिम पॉक परियोजना के तहत सरसों फसल पर लगाए गए प्रदर्शन दिखाने के लिए फसल दिवस का आयोजन किया गया। इस कार्यक्रम का संचालन पृथ्वीराज द्वारा कृषि विज्ञान केंद्र के हेड डा. अरविंद कुमार के निर्देशन में सुशील कुमार किसान के खेत में किया गया। किसान के यहां सरसों की वैरायटी आर एच 725 लगवाई गई है जिसका प्रदर्शन अन्य किसानों को भी दिखाया गया तथा सभी किसानों ने इस किस्म की सरसो को सराहना की। इस मौके पर डा. अरविंद कुमार द्वारा कृषि विज्ञान केंद्र की गतिविधियों एवं कार्यक्रमों के बारे में किसानों को अवगत करवाया। पृथ्वीराज द्वारा इस परियोजना के तहत जगह-जगह पर लगाए गए प्रदर्शनों की जानकारी किसानों को दी। स्प्रेड कीर द्वारा स्वास्थ्य सुरक्षा एवं पोषण के बारे में जानकारी दी गई। इस कार्यक्रम में कुल 42 किसानों ने भाग लेकर कार्यक्रम को सफल बनाया।

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**कृषि विज्ञान केंद्र सीफेट ने फसल दिवस मनाया**



प्रदर्शनी दिखाते हुए सीफेट अधिकारी।

**सवेरा न्यूज़/कधूरिया अबोहर :** केवीके व सीफेट द्वारा बहावलवासी गांव में समूह अग्रिम पॉक परियोजना के तहत सरसों फसल पर लगाए गए प्रदर्शन दिखाने के लिए फसल दिवस का आयोजन किया गया। इस कार्यक्रम का संचालन पृथ्वीराज द्वारा कृषि विज्ञान केंद्र के हेड डा. अरविंद कुमार के निर्देशन में रमनदीप सिंह किसान के खेत में किया गया। इस किसान के यहां सरसों की वैरायटी आरएच 725 लगवाई गई है जिसका प्रदर्शन अन्य किसानों को भी दिखाया गया तथा सभी किसानों ने इस किस्म की सराहना की। इस मौके पर डॉ. अरविंद कुमार द्वारा कृषि विज्ञान केंद्र की गतिविधियों एवं कार्यक्रमों के बारे में किसानों को अवगत करवाया। पृथ्वीराज द्वारा इस परियोजना के तहत जगह-जगह लगाए गए प्रदर्शनों की जानकारी किसानों को दी। विमल कुमार द्वारा फसल प्रबंधन में विभिन्न तरह की नई तकनीक के बारे में जानकारी दी।

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**नींबूवर्गीय फलों के बागों के विकार प्रबंधन पर प्रशिक्षण कार्यक्रम**



सीफेट अधिकारी व किसान।

**सवेरा न्यूज़/धर्मवीर, अबोहर :** कृषि विज्ञान केंद्र फाजिल्का (क्षेत्रीय केंद्र सीफेट अबोहर) द्वारा नींबू वर्गीय फलों के बागों में फलों के गिरने एवं विकार प्रबंधन पर प्रशिक्षण कार्यक्रम का आयोजन दिनांक 20 मार्च को किया गया। इस कार्यक्रम का संचालन डॉक्टर अरविंद कुमार हेड कृषि विज्ञान केंद्र के निर्देशन में राजेश कुमार द्वारा किया गया। इस कार्यक्रम के अंतर्गत राजेश कुमार द्वारा नींबू वर्गीय फलों में विकार के विभिन्न कारण एवं प्रबंधन पर विस्तारपूर्वक चर्चा की गई। विमल कुमार द्वारा नींबू वर्गीय फलों के गिरने के कारण एवं राकथम के उपाय के बारे में विस्तारपूर्वक बताया गया। इसके साथ-साथ नींबू वर्ग के फलों के उत्पादन में आने वाली विभिन्न समस्याओं पर भी खुली चर्चा की गई। इस प्रशिक्षण कार्यक्रम के दौरान कृषि विज्ञान केंद्र के हेड डॉक्टर अरविंद कुमार, गृह विज्ञान विशेषज्ञ डॉक्टर रूपेंद्र कौर, पृथ्वीराज, डॉ. महेश कुमार समोता उपस्थित रहे।

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**ग्रीष्मकालीन सब्जियों की उत्पादन तकनीक पर प्रशिक्षण कार्यक्रम का आयोजन**



अधिकारी किसानों को जानकारी देते हुए।

**सवेरा न्यूज़/धर्मवीर अबोहर, 19 अप्रैल :** कृषि विज्ञान केंद्र-सीफेट द्वारा ग्रीष्मकालीन सब्जियों के उत्पादन तकनीकी पर एक दिवसीय प्रशिक्षण कार्यक्रम का आयोजन दिनांक 19 अप्रैल 2024 को कृषि विज्ञान केंद्र पर करवाया गया। इस कार्यक्रम का संचालन राजेश कुमार सहायक मुख्य तकनीकी अधिकारी द्वारा डॉक्टर अरविंद कुमार हेड कृषि विज्ञान केंद्र के दिशा निर्देशन में किया गया। इस कार्यक्रम के तहत राजेश कुमार द्वारा सब्जी उत्पादन की महत्ता को बताते हुए सब्जियों में होने वाले कीट एवं रोग नियंत्रण की विभिन्न तकनीकों पर विस्तृत जानकारी दी गई। डॉ. प्रकाश महला द्वारा ग्रीष्मकालीन सब्जियों के उत्पादन में बीज की किस्म, उर्वरक की मात्रा, सिंचाई प्रक्रिया एवं उतम समय पर सब्जियों की तुड़वाई एवं रख-रखाव के बारे में बताया गया। इस कार्यक्रम के मौके पर क्षेत्रीय केंद्र सीफेट अबोहर के अध्यक्ष डॉ. अमित नाथ, कृषि विज्ञान केंद्र के डॉक्टर रूपेंद्र कौर, पृथ्वीराज एवं विमल कुमार उपस्थित रहे। डॉक्टर अमितनाथ ने किसानों को सब्जी उत्पादन की उन्नत तकनीकी अपनाने के अधिक लाभ कमाने के लिए प्रेरित किया। इस कार्यक्रम के अंत में सभी प्रशिक्षणार्थियों को सब्जियों के बीज कोट भी वितरित की गई। कुल 25 प्रशिक्षणार्थियों ने भाग लेकर कार्यक्रम को सफल बनाया।

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## खुईखेड़ा व खिप्पावाली में फसल कटाई दिवस मनाया

सवेरा न्यूज/धर्मवीर

अबोहर, 12 अप्रैल : कृषि विज्ञान केंद्र सीफेट अबोहर द्वारा फसल प्रबंधन परियोजना के तहत गोद लिए गये गांव खुईखेड़ा एवं खिप्पावाली में फसल कटाई दिवस का आयोजन 12 अप्रैल को किया गया। इस कार्यक्रम का संचालन डा. रूपेंद्र कौर विशेषज्ञ गृह विज्ञान द्वारा डॉक्टर अरविंद कुमार अहलावत हेड कृषि विज्ञान केंद्र के दिशा निर्देशन में किया गया। कार्यक्रम तहत पराली प्रबंधन करके बीजी गई गेहूं की फसल के उत्पादन एवं अन्य आंकड़ों का आकलन किसानों को करवाया गया। फसल कटाई के समय ध्यान रखने योग्य बातें एवं आगामी फसल की बीजाई सम्बन्धी विभिन्न पर

चर्चा की गई। किसानों को उन्नत किस्म के बीज, दर एवं अन्य व्यवस्थाओं के बारे में अवगत करवाया गया। इस कार्यक्रम में कृषि विज्ञान केंद्र के हेड डॉक्टर अरविंद कुमार अहलावत, पृथ्वीराज सहायक मुख्य तकनीकी अधिकारी सीफेट अबोहर, विमल कुमार एवं डॉ अरमान सिंह एडीओ सहित कुल 139 प्रतिभागियों ने भाग लेकर कार्यक्रम को सफल बनाया।



अधिकारी किसानों को जानकारी देते हुए।

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जयपुर-दूदू भास्कर 02-05-2024

## खेती-किसानी • नवाचारों व अनुसंधान से छात्रों को आगे बढ़ाने में मदद मिलेगी, कार्यशाला में 132 छात्र-छात्राओं ने लिया भाग कृषि उद्यमिता किसानों की आय बढ़ाने का प्रमुख साधन : डॉ बलराज सिंह

भारत न्यूज | जोधपूर  
कृषि महाविद्यालय में बुधवार को 'फार्म प्रोसेसिंग के माध्यम से उद्यमिता विकास' विषय पर आयोजित कार्यशाला में विश्वविद्यालय कुलपति डॉ बलराज सिंह ने नई फसल करते हुए विद्यार्थी संस्था के वैज्ञानिकों के अनुभवों को संस्था के छात्रों के साथ साझा करने की शुरुआत की।

उन्होंने कहा नए नवाचारों व अनुसंधान से छात्रों को आगे बढ़ाने में मदद मिलेगी व कृषि उद्यमिता किसानों की आय बढ़ाने का प्रमुख साधन है। साथ ही कृषि में नवाचार लाने की

बहुत आवश्यकता बताई। मुख्य वक्ता डॉ संदीप मान प्रमुख वैज्ञानिक सहायक कृषि उपरान्त अभियांत्रिकी एवं प्रौद्योगिकी संस्थान ने कहा कि कृषि महाविद्यालय कृषि शिक्षा में भी अग्र भूमिका निभाई है। हाल ही में हुए नवाचारों जैसे टमाटर के प्रसंस्कृत उत्पाद, समन्वित शाद प्रसंस्कृत ईकाई, पारंपरिक खाद्य पदार्थों का मशीनीकरण, जैविक प्रसंस्कृत गुड, सोलेर ड्रयर के उदाहरण देते हुए किसानों को उद्यमिता की ओर आकर्षण करने के लिए प्रेरित किया। कुशल कृषि के साथ साथ कृषि उद्यमिता के माध्यम से आय को बढ़ा सकते हैं।



उच्च गुणवत्ता के लिए मिर्ची को खुले में नहीं सुखाएँ

जोधपूर। उद्यमिता विकास पर आयोजित कार्यशाला में संबोधित करते कुलपति डॉ बलराज सिंह।

कृषकों के हित में बात करते हुए कहा कि अगर वे मिर्ची को खुले में न सुखा कर सोलेर टनल ड्रयर में सुखाते हैं तो उससे उच्च गुणवत्ता की मिर्ची प्राप्त होती है व बाजार में उसका मूल्य भी अधिक मिलता है। गाजर को विभिन्न मशीनों से धो कर उसकी ड्रैजिंग करें व बाजार में बेचें तो इससे भी किसानों को अधिक मुनाफा हो सकता है। उन्होंने प्रसंस्करण व मूल्य संवर्धन का महत्व बताते हुए कहा कि प्रसंस्करण अपव्यय को कम करने में मदद करता है, मूल्यवर्धन में सुधार और फसल निविधीकरण को बढ़ावा देता है, यह क्षेत्र खाद्य सुरक्षा, खाद्य सुरक्षा के पीछे भोजन प्रदान करने में भी सक्षम है। सह अधिष्ठाता डॉ. शैलेशा मास्कर ने उपायव्यक्तता बढ़ाने, खेती के तरीकों में नए नवाचार आनाने पर जोर दिया है। इस दौरान स्नातक, स्नातकोत्तर व विद्याव्यस्यपति के 132 छात्र छात्राओं ने भाग लिया।

**THE SOCIAL 24**  
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**TRENDING**  
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On May 10th, 2024, ICAR-CIPHET, in collaboration with GT Bharat, organized an awareness and sensitization program focusing on bakery processing in Ahilana Village, Nisapur Bodi, Roopnagar. The program aimed to explore bakery-driven agricultural business opportunities within the production catchment area, with a special focus on empowering 110 women beneficiaries.

Under the Agri-business Incubation project, generously funded by IPTM, ICAR, and facilitated by Grant Thornton Bharat, ICAR-CIPHET, Ludhiana, took the lead in spearheading the training. The program commenced with beneficiary registration, followed by an elucidation of CIPHET's crucial role in post-harvest activities and service provisions. Dr. Ranjeet Singh, Head of the Transfer of Technology Division at ICAR-CIPHET, delivered a lecture on the significance of agribusiness incubation in augmenting the income of rural women. He emphasized the necessity of skill enhancement and the creation of a conducive environment for entrepreneurial endeavors, particularly in bakery-based rural enterprises. The event underscored the commitment of all stakeholders towards empowering rural women through skill development and entrepreneurship.

Bakery training program agriculture business dr ranjeet singh bakery empowering rural women

**सार संक्षेप**

**कृषक व उधमी संगोष्ठी का आयोजन**



**मीटिंग करते अधिकारी।**

**सवेरा न्यूज/कथूरिया अबोहर :** विश्व पर्यावरण दिवस के उपलक्ष में सीफेट के लुधियाना व अबोहर केंद्रों पर भूमि पुनर्स्थापन, मरुस्थलीकरण व सूखा लचीलापन विषय पर 30 से लेकर 5 तक विभिन्न जागरूकता कार्यक्रमों का आयोजन किया जा रहा है। इसी उपलक्ष में कृषि विज्ञान केंद्र फाजिल्का, सीफेट अबोहर द्वारा कृषक एवं उधमी संगोष्ठी का आयोजन किया गया। इस अवसर पर कृषि विज्ञान केंद्र के कार्यक्रम समन्वयक डा. अरविन्द कुमार द्वारा पर्यावरण को विभिन्न कारणों से हो रही क्षति के बारे में प्रकाश डालते हुए इसके मानवीय, जीव-जंतु एवं वानस्पतिक जीवन पर पड़ रहे विपरीत प्रभावों के बारे में चर्चा की। उन्होंने साथ ही साथ ये आह्वान किया कि किसान कम सिंचाई आवश्यकता वाली फसले अपनाएं व इस तरह की किस्मों का चयन करें जो मौसम में हो रहे बदलावों के प्रति सहनशील हों। इस अवसर पर राजेश कुमार, पृथ्वी राज, विमल भोबरिया के अतिरिक्त समूह स्टाफ सदस्य भी उपस्थित थे। इस कार्यक्रम में लगभग 40 परिभागियों ने भाग लेकर कार्यक्रम को सफल बनाया।

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## नवाचारों और अनुसंधानों से छात्रों को आगे बढ़ाने में मदद मिलेगी : डॉ. बलराज सिंह

**जोबनेर।** श्री कर्ण नरेंद्र कृषि महाविद्यालय में बुधवार को 'फॉर्म प्रोसेसिंग' के माध्यम से उद्यमिता विकास' विषय पर कार्यशाला का आयोजन हुआ। विवि के कुलपति डॉ. बलराज सिंह ने नई पहल करते हुए विख्यात संस्था के वैज्ञानिकों के अनुभवों को संस्था के छात्रों के साथ साझा करने की शुरुआत की है। डॉ. बलराज सिंह ने बताया कि नए नवाचारों व अनुसंधान से छात्रों को आगे बढ़ाने में मदद मिलेगी व कृषि उद्यमिता किसानों को आय बढ़ाने का प्रमुख साधन है। साथ ही कृषि में नवाचार लाने की बहुत आवश्यकता है। इस कार्यशाला के मुख्य वक्ता डॉ. संदीप मान प्रमुख वैज्ञानिक केंद्रीय कृषि उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान रहे।

उन्होंने महाविद्यालय के इतिहास के बारे में चर्चा करते हुए कहा कि कृषि महाविद्यालय का गौरवशाली इतिहास रहा है व साथ ही कृषि शिक्षा में भी अग्रम भूमिका निभाई है। उन्होंने हाल ही में हुए नवाचारों जैसे टमाटर के प्रसंस्कृत उत्पाद, समन्वित शहद प्रसंस्कृत ईकाई, पारंपरिक खाद्य पदार्थों का मशीनीकरण, जैविक प्रसंस्कृत गुड, सोलर ड्रायर के उदाहरण देते हुए किसानों को उद्यमिता की ओर अग्रसर होने के लिए प्रेरित



किया जिनको अपना के कृषक कृषि के साथ साथ कृषि उद्यमिता के माध्यम से आय को बढ़ा सकते हैं। साथ ही उन्होंने कृषकों के हित में बात करते हुए कहा कि अगर वे मिर्ची को खुले में न सुखा कर सोलर टनल ड्रायर में सुखाते हैं, तो उससे उच्च गुणवत्ता की मिर्ची प्राप्त होती है व बाजार में उसका मूल्य भी अधिक मिलता है व गाजर को विभिन्न मशीनों से धो कर उसकी ट्रेडिंग करे व बाजार में बेचे तो इससे भी किसानों को अधिक मुनाफा हो सकता है। किसान की

समस्याओं के बारे में बताते हुए कहा कि भूमि जोत का छोटा आकार, अकृशल जल प्रबंधन, उत्पादन की उच्च लागत, विविधता लाने की क्षमता का अभाव, कृषि स्तर पर मूल्य वर्धन का अभाव, अपर्याप्त भंडारण सुविधा, कमजोर संगठनात्मक क्षमता, कृषि ऋण लेने में बाधता इत्यादि समस्याएँ हैं। जिनका समाधान कर कृषकों को उद्यमिता की ओर कदम बढ़ाने के लिए प्रेरित किया जा सकता है। उन्होंने प्रसंस्करण व मूल्य वर्धन के महत्व के बारे में बताते हुए कहा

कि प्रसंस्करण अपव्यव को कम करने में मदद करता है। मूल्य वर्धन में सुधार और फसल विविधीकरण को बढ़ावा देता है, यह क्षेत्र खाद्य सुरक्षा, खाद्य मुद्रास्फीति जैसे महत्वपूर्ण मुद्दों को संबोधित करने और जनता को पौष्टिक भोजन प्रदान करने में भी सक्षम है। सह अधिष्ठाता डॉ. शैलेश मारकर ने कृषि तथा व्यवसाय गतिविधियों पर प्रकाश डालते हुए उत्पादकता बढ़ाने, खेती के तरीकों में नए नवाचार अपनाने पर जोर दिया है। डॉ. शैलेश मारकर ने अंत में धन्यवाद ज्ञापित किया। इस कार्यशाला के आयोजक डॉ. ब्रिजेश चधाला ने बताया कि आगे भी विद्यार्थियों के उज्वल भविष्य के लिए इस तरह की कार्यशालाओं के आयोजन किए जाएंगे। उन्होंने बताया कि कार्यशाला के दौरान स्नातक, स्नातकोत्तर व विद्यावचास्यति के 132 छात्र छात्राओं ने भाग लिया व स्नातक वर्ष के विद्यार्थियों के लिए टेस्ट का भी आयोजन किया गया। इस के साथ ही अंतिम वर्ष के छात्र-छात्राओं के लिए भी जे आर एफ की कक्षाएँ भी आयोजित की गईं। जिसमें कृषि सांख्यिकी की कक्षा डॉ. शांतिनि कर्माकर ने ली। इस दौरान डॉ. आशुप खान, डॉ. उपेंद्र सिंह, डॉ. राजेश सिंह व डॉ. नवीन कुमार मौजूद रहे।