

FoodPro

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DG's Visit to Food Engineering Centre



His Highness YKC Wadiyar at CSIR-CFTRI



CSIR-CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
(Council of Scientific & Industrial Research)
Mysuru - 570 020

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DG-CSIR Visit to CSIR-CFTRI (Dec 14, 2019)

Dr. Shekhar C. Mande, Director General, CSIR and Secretary, DSIR, New Delhi addressed staff and students of the Institute. Earlier, DG visited Incubation Centre, Pilot Plant, Advanced Instrumentation Facility, Food Safety & Analytical Quality Control Laboratory and ISMT. DG-CSIR also released a new logo of the Institute and CSIR-CFTRI Newsletter "FoodPro".

Excerpts from DG's Address

DG-CSIR delivered a lecture on "Science, Technology, Innovation & Society". Excerpts from his lecture is given below:

"Science feeds mainly on technology and innovation, and it is also a major driver of growth. Many organizations including CSIR have the motto of ensuring that our society ultimately benefits from science. Technology and innovation drive the basic fundamentals of science. To quote from 'Usefulness of Useless Knowledge' by Abraham Flexner, 'Is it not a curious fact that in a world steeped in irrational hatreds which threaten civilization itself, men and women-old and young-detach themselves wholly or partly from the angry current of daily life to devote themselves to the

DG addressing CFTRI Staff & Students



cultivation of beauty, to the extension of knowledge, to the cure of disease, to the amelioration of suffering, just as though fanatics were not simultaneously engaged in spreading pain, ugliness, and suffering?" This quote is representative of our entire community, learning to dedicate ourselves and to separate ourselves from daily routines of life."

"Infant food based on CSIR-CFTRI technology, Amul has been a household name for decades in the country. CFTRI developed this tasty and nutritious formula for children. Earlier to infant food formulation by CSIR-CFTRI, buffalo's milk was deemed unsuitable for easy digestion by babies. Nevertheless, CSIR-CFTRI research has shown that buffalo's milk can be turned into a nourishing food for children. This achievement

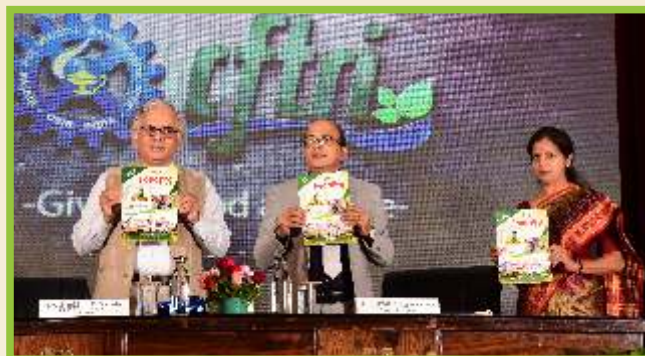
gave the Indian dairy industry a significant boost, thus fulfilling the country's requirements to have an indigenous technology for manufacturing infant foods. Over the years, CSIR-CFTRI has contributed a lot of useful things including Pappad machine for rural womenfolks.”

CSIR's recent contributions to society

“CSIR Aroma Mission was planned to bring revolutionary changes to the aroma sector through desired interventions in the agricultural, processing and product development areas to drive the growth of the aroma industry and rural employment. Several CSIR institutions including CIMAP, CDRI, NBRI and IITR from Lucknow, IIM-Jammu, IHBT-Palampur, URDIP-Pune and NEIST-Jorhat have joined in this effort to develop and popularize technologies for the production, processing, value added products development and marketing of medicinal and aromatic plants. Under the Aroma Mission, various economically important aromatic crops including Mint, Vetiver, Lemon Grass, Palmarosa, Ocimum, Patchouli, Lavender, Rosemary, Tagetes, Jammu Monarda and Valerian has been taken up.”

“Yet another contribution is from Central Scientific Instruments Organization (CSIO) for visually challenged. The lab has developed the most advanced reading machine to-date. The stylish scanner called "Divya Nayan" can scan any document, and reads it aloud for visually impaired. The portable system is based on the principle of scanning and translating a printed document into speech just by touch. We should be proud of these innovations, made across CSIR laboratories,

DG releasing **FoodPro** inaugural issue



bringing value to society through innovative S&T solutions.”

“We have to think about future, and draw a roadmap to meet our long term vision. There are many current issues that need to be tackled in the future including malnutrition, drinking water, energy, climate, food safety and health care. In S&T innovation, all these problems have potential solutions; our job is to ponder over them, come with roadmap to address these problems. It is our moral duty to overcome these problems and ensure finding viable solutions. Innovative solutions for malnutrition with appropriate technological solutions is the responsibility of all of us and CSIR-CFTRI in particular can do for the future and sustain the leadership in this sector to become a global leader in Food Technology. Young scientists should think about this on an ongoing basis and have informal discussions to come up with new ideas to address future issues. We have to make sure that we live a better life and make sure we leave it as a the better place for the generations to come. It is a sustainable world, a much better world than today and a world where people are much happier to prepare for the future generations.”

Research Highlights

Low fat probiotic ice cream

Increasing human health awareness has compelled food scientists to create food supplements and functional foods that have shown health benefits apart from normal nutrient delivery. And every day new products are added to the list and one is the CSIR-CFTRI product like ice cream, a food rich in nutrients that is widely accepted by people of all sorts.

Researchers in the Institute have developed a low-fat synbiotic ice cream using β -manno-

oligosaccharides (β -MOS), plant derived fibre as a prebiotic component and *Lactobacillus plantarum* and *Lactobacillus fermentum* as probiotics. β -MOS was used as it improved the counts of beneficial lactobacilli under harsh gastro-intestinal environment and to create many opportunities for new, innovative and healthy foods.

The ice cream mix consists of milk powder, sugar, fat, stabilizer, emulsifier, vanillin, milk with or without β -MOS. Various ice cream formulations were prepared such as normal fat ice cream and low-fat ice cream containing probiotic *Lactobacillus* spp., supplemented with β -MOS. The ice cream mixes were stored at -20°C to

analyze their performance during storage while preserving the probiotic cultures. In low-fat synbiotic ice creams, there was greater consistency index, flow behavior and viscosity compared to control low-fat ice cream.

In a simulated gastrointestinal environment, the novel ice creams were evaluated and the presence

of β -MOS enhanced the survival of *Lactobacillus plantarum* as well as *Lactobacillus fermentum* under gastric and intestinal stress compared to the respective ice cream controls.

(Source: Deepesh, P., Shubhashini, A., Kapoor, M., 2019. Enhanced survival of *Lactobacillus* sp. in β -manno-oligosaccharides-enriched low-fat ice cream under simulated gastrointestinal stress. *Journal of Food Processing and Preservation*, 43(9), e14097)

IPR in the Horizon

A Novel Process for Preparation of Green Amla Powder

CSIR-CFTRI has patented a novel process for preparation of green Amla powder which is quite different from those traditional/current practices and the powdered Amla gratings having good aroma with natural green color. The process consists of grading/separation of green Amla berries from riped Amla berries followed by thorough washing with hot water at temperature ranging between 70~80°C to remove the soil, stones, dirt and other foreign materials. Washed Amla berries were subjected to air/shade drying for removal of surface moisture and subjected to grating using a dedicated grating machine to

obtain the required particle size followed by formulating the gratings with sodium chloride. Pre-determined quantities of wet gratings are spread on the stainless-steel trays and loaded into the cabinet drier for the time ranging from 8-10 h which is maintained at a temperature of 40-50°C. The dried green Amla powder is homogenized using a granulator and the size of the gratings are in the range of 2-3 mm. The granulated powder was packaged in opaque polyethylene pouches and stored in cartons. No additives were used for retention of flavour and colour. The green Amla powder has a shelf life of more than 3 months at 37.2°C in thermo stable pouches.

(Source: A Novel Process for Preparation of Green Amla Powder. Venkatesh Murthy., Chetana R., Nitin Sonkar., Suresh Kumar G., Roopa B.S., 2019 (0036NF2019/IN))

New Technologies

Shelf Stable Muffins and Bread with Natural Preservatives

CSIR-CFTRI has commercialized shelf stable muffins and bread technologies that have natural ingredients as preservatives which function as anti-microbial and antioxidants. These technologies have been transferred to two well known companies in the global market. Muffins otherwise called cupcakes have high water content and low shelf-life and can be kept for 8-10 days without any preservatives. Bread has a shelf life of 2-3 days. Preservatives such as antimicrobials, antioxidants, chelating agents, and calcium propionate / sorbic acid are used to last longer and for keeping their colour, taste and nutrients intact.



Because of its non-toxic nature and lack of adverse side effects, the use of natural preservatives is gaining importance in recent years. The shelf stable muffins and bread with natural ingredients as preservatives prevent the muffins from going bad and the bread has good volume, soft texture and free from moulds. Therefore, the use of natural ingredients as preservatives is microbiologically healthy for 3 weeks in muffins and mould-free bread has a shelf life of 5 days.

Technologies Transferred

- ✦ Pickles and Chutney: Preparation (Sabithas Food Products, Kerala)
- ✦ Layered parotta - South Indian (EB Food and Technologies Pvt Ltd., Kerala)

- ✦ Wafers: Meat, Fish, Chicken, Prawn, Egg and Pork, Dehydrated egg cubes and Deep fat fried egg cubes (Connect Plus Technologies, Kerala)
- ✦ Online fortification of Atta- Whole wheat flour/ Maida- Refined wheat flour (Karnataka Health Promotion Trust, Bengaluru)

- ✦ Fermented & Dehydrated Ready Mixes for Idli/Dosa Batter (Servosonic Foods, Kerala)
- ✦ Bioactive molecule Rich Green Coffee Extraction (S.L.N Coffee Pvt Ltd., Kushalnagar)
- ✦ Convenience Flour from Ragi suitable for stiff Porridge (Prathibha Enterprises, Bengaluru)
- ✦ Osmo-air dried fruits Amla, Jackfruit and Pineapple (North East Farm Sales Promotion, Assam)
- ✦ Compounded Asafoetida (Lifestyle Foods Pvt Ltd., Haryana)
- ✦ Canned- aluminium cans mixed veg curry and rice based convenience foods, Pickles and chutney: Preparation, Spice Mix formulation: Rasam and Gravy paste for different Indian Cuisine (Mahashian Di Hatti Pvt Ltd., Haryana)
- ✦ Eggless cake premix (Shyam Sanjay, Chennai)

New Start-ups

Three new startups joined CSIR-CFTRI Incubation Centre during this period.

- ✦ Salutory Nutryfoods has been established with the objective of extraction and utilization of bioactive compounds from vegetable and fruit waste as nutraceuticals. The primary concept of the company is to find suitable methods for extraction of bioactives for wider applications.
- ✦ MarvelTree Biosolutions is a plant based wellness product company. The company is exploring the medicinal, nutritional and special properties of different parts of Moringa tree.
- ✦ Duosis Bio-innovations Pvt Ltd., a DIPP recognized women-led start up is working on the production of food ingredients from agro-industrial spin-offs. The company is involved in turning these by-products into values and intends to develop cost-effective and sustainable food ingredients for food processing industries.

Entrepreneur Speak

Praras Biosciences Pvt. Ltd., is bio-sciences company started by Dr. Sujata Ojha, an alumni of CFTRI, engaged in the manufacturing and marketing of specialty biochemicals for diverse industries like beverages, food and plantation crops. PBPL specializes in providing solutions for product and / or process improvement, cost savings, import substitution and greater sustainability for the customers.

The company with headquarters in Bangalore along with Overseas branches in Singapore and Germany has FSSAI and GFSI certified manufacturing facility and a fully equipped R&D centre in Bangalore.

A-HANGO production is licensed to Praras Biosciences Pvt. Ltd (PBPL) from CFTRI. A-HANGO is an intra cellular peptide extracted by fermentation of food grade microorganisms. A-HANGO aids in precipitation and removal of acetaldehyde from the blood, thus enables anti-hangover effect. The symptoms of hangover are recognised as dizziness, headache, vomiting, etc.



Product range and brands: The product ranges under different industry segments include Mashaid, Carraflocaid for brewery; Flocaid, Aidferm for Wine; Biscamaze, Preccel, Hifoamaid, Stabaid for Food; Fermaid for brewery, distillation and plantation.

Vision & Challenges:

- ✦ To add value to customer's processes and products by using environment friendly products.
- ✦ Strong competition and new market entry by MNCs
- ✦ Entry into international markets

Role of CFTRI in catalyzing growth of your firm: CFTRI plays indirect role by improving PBPL's brand thereby reducing the entry barrier to the food companies.

Your advice to emerging startups: Failure is the first step towards your endeavours to success. Always learn from it and be focused.

New Collaborations

KIIT-Technology Business Incubator (KIIT-TBI), Bhubaneswar (Nov 9, 2019)

The MoU intends to strengthen collaboration between CSIR-CFTRI and KIIT-TBI for the progress of academia, researchers and industry in the area of food processing including nurturing of startups.

Maharashtra Centre for Entrepreneurship Development, Aurangabad (Nov 11, 2019)

MoU's scope is to enable state-owned food processing industry through Entrepreneurship development programs in fruit and vegetable processing, spice processing, bakery technology, and cereal processing areas.

NBI Biosciences Pvt Ltd., New Delhi (Dec 4, 2019)

CSIR-CFTRI has initiated a collaborative project with this company in order to carry out Cordyceps

extracts in herbal formulations with nutraceutical and medical benefits.

Deshpande Foundation, Hubli (Jan 9, 2020)

This MoU intends to strengthen capacity development of micro entrepreneurs of Navodayami, incubatees, social enterprises with the support of CFTRI in Sandbox region (seven districts of North Karnataka – Dharwad, Uttara Kannada, Haveri, Belgaum, Gadag, Davangeri, Bagalkote).

Agricultural and Processed Food Products Export Development Authority (APEDA), New Delhi (Feb 2, 2020)

This initiative was meant to provide technical support to the food industry of North East region.

Spirulina Foundation, Tumkur (Feb 6, 2020)

Under this MoU, a nutritional impact assessment study will be undertaken to improve the nutritional status of Anganwadi children with spirulina chikki as a supplement in Tumkur district in association with officials from the District Administration.

Happenings

Skill Development Training Programmes

FOODPRENEUR 2020 (Jan 20-25, 2020)

CSIR-CFTRI in joint initiative with Kautilya Entrepreneurship and Management Institute (KEMI), Bangalore conducted this programme.



Capacity Building Training Programs on Food Processing (Jan-Feb, 2020)

As part of Capacity Building Training Programs on Food Processing for SC-ST aspiring/budding or existing entrepreneurs under the aegis of National SC-ST Hub, Ministry of MSME, Govt. of India, the following training programmes were held and a total of 71 participants attended.

- ✦ Fruit and Vegetable Technologies for Value Addition
- ✦ Spice Processing: Business Opportunities & Future Prospective
- ✦ Wheat Milling and Baking Technology

Processing of Fruits & Vegetables (Feb 10-13, 2020 & Feb 24-27, 2020)

A programme on the processing of fruits and vegetables for 3 days was conducted for students of JSS, Mysuru who is currently undergoing B.Voc/M.Voc in Food Processing. A total of 40 participants attended the programme.

NSQF aligned skill development programme on Baking Technology (Jan 20-Feb 14, 2020)

As part of CSIR's Skill India Initiative, CSIR-CFTRI conducted a 4-week skill development program on "Baking Technology" under the aegis of National School of Baking Technology. The course was in line with the specifications / guidelines of the National Skill Development Corporation (NSDC) to address the needs of the fast-growing baking industry. A total of 23 participants were trained on choice of quality ingredients, product development

and quality criteria. Besides this, the participants were also given insight on packaging aspects, FSSAI guidelines, nutritional profiling, health and hygiene. The course can provide job opportunities for persons intending to have a career in baking industry, SHGs, un-organized bakery personnel, quality control managers, lab technicians / assistants etc. The course has been beneficial for prospective entrepreneurs who want to start their own bakery units. The candidates were awarded



NSDC certificates in Qualification pack: Baking Technician/Operative (FIC/Q5005; NSQF level 4).

Events

Kannada Habba (Dec 10, 2019)

Kannada Sahrudaya Balaga performed valedictory function of Kannada Habba on Dec. 10, 2019. Dr. KSMS Raghavarao, Director, CSIR-CFTRI presided the function.

Bioprocessing India Conference (Dec 14-16, 2019)

7th Bioprocessing India Conference was held at CSIR-CFTRI during Dec 14-16, 2019. Dr. Shekhar C. Mande, Secretary, DSIR & Director General, CSIR inaugurated the Conference and addressed the gathering.

Republic Day Celebrations (Jan 26, 2020)

Republic Day was celebrated in the Institute on Jan 26, 2020. Dr. KSMS Raghavarao, Director, CSIR-CFTRI hoisted the National Flag and addressed the gathering. Patriotic songs were sung by staff and students.

Food Micro-Entrepreneurs Network (Jan 27, 2020)

CSIR-CFTRI, Mysuru, organised a one-day workshop on 'Value Chain Network for Food Micro-Entrepreneurs in Mysuru' in the area of agri-food processing under Micro-Entrepreneurs Network (MENT) forum.

Future India Talks Series (Jan & Feb, 2020)

Under the Future India Talks series, Dr. Sivananda Kanavi, Former Vice-president, TCS & Former Editor, Business India delivered a Popular Lecture entitled "How Indians Won the Silicon Valley" on Jan 10, 2020.

Prof. Amitabh Joshi, Evolutionary Biology and Organismal Biology, JNCASR, Bangalore

delivered a Popular Lecture entitled "Why Evolution is central to both Biology and our lives" on Feb 13, 2020 in the Institute.

Releasing of Theatre Fest Poster by Prof. Amitabh Joshi



Seminar on Innovation & Sustainable Information Services in the Digital Era (Feb 3, 2020)

CSIR-CFTRI, Mysuru conducted one day seminar on "Innovation & Sustainable Information Services in the Digital Era" on Feb 4, 2020 in association with ICSSR, New Delhi, AFST(I), Mysuru, American Chemical Society and Springer Nature. Prof. T.D. Kemparaju, Vice-Chancellor, Bangalore North University inaugurated the seminar and addressed the gathering. Dr. KSMS Raghavarao, Director, CSIR-CFTRI delivered the presidential address. Eminent speakers from National Institutes / Organisations delivered talks on topics related to "Open source information systems and State of Art Information Services". A total of 85 participants attended the workshop.



Training Programme for Administrative Staff (Feb 10-11, 2020)

Two-day training programme was held at CSIR-CFTRI from Feb 10-11, 2020 by Shri. R K Sarma, Retd. Sr. COA, from Hyderabad. Dr. KSMS Raghavarao, Director, CSIR-CFTRI presided the inaugural session. Training was imparted to staff of Administration, Finance & Accounts and Stores & Purchase. The staff members were trained on Vigilance, Financial Rules, General Administrative Rules, Office procedure, Conduct Rules etc.

JIGYASA (Feb, 2020)

Scientists-student connect programme, Jigyasa was held at KV Mandya on Feb 10, 2020, KV Chamarajanagar on Feb 14, 2020 and KV Mysuru on Feb 19, 2020. A total of 346 students and 19 teachers from these schools participated in the event and interacted with scientists.

Delegations/Exchange Programme

- ✦ His Highness Yaduveer Krishnadatta Chamaraja Wadiyar visited CSIR-CFTRI and facilities on Dec 27, 2019 and addressed Staff & Students of the Institute.
- ✦ Under study abroad Programme, Graduate Students & Faculty from University of Wisconsin-Riverfalls, USA attended 1-week Skill Development Training Programme during Jan 11-17, 2020.

Selected Publications

- ✦ Makroo H.A., Rastogi N.K., Srivastava, B. Ohmic heating assisted inactivation of enzymes and microorganisms in foods: A review. *Trends in Food Sci. & Technol.*, 2020, 97, 451-465. (IF: 8.519)
- ✦ Sunil L., Vasu, P. Cloning and expression of *in silico* modeled protein enriched with branched

SRIFT 2020 Conference (Feb 15, 2020)

Innovation in Food-Tech, powered by Silicon Road Accelerator, Mysuru in partnership with CSIR-CFTRI conducted one-day conference on Feb 15, 2020 at Radisson Blu, Mysuru in which more than 250 delegates from Industry/Academia participated.

Bhumi Pooja for setting up a Global Centre of Rice Technology (GCRT) (Feb 22, 2020)

Bhumi Pooja was held in the M.G. Halli campus of CSIR-CFTRI for setting up a Global Centre of Rice Technology (GCRT). Shri. Sid Mukherjee, MD, Silicon Road Accelerator was the Chief Guest. The centre would establish a missing vital link between the Rice milling sector and the academia. This facility will be established in collaboration with M/s APIT, Bengaluru and M/s Buhler India Pvt. Ltd.

- ✦ IAS Probationary Officers visited CSIR-CFTRI on Jan 22, 2020 as part of Bharath Darshan and interacted with Scientists.
- ✦ A delegation from Embassy of Denmark visited CSIR-CFTRI on Feb 7, 2020 for discussion with CFTRI Scientists pertaining to collaborative projects between both the institutions in the area of Food Science and Technology.

chain amino acids in *Pichia pastoris*. *Int. Journal of Biol. Macromolecules*, 2020, 146, 739-745. (IF: 4.784)

- ✦ Panwar D., Shubhashini A., Chaudhari S.R., Prashanth K.V.H., Kapoor M. GH36 α -galactosidase from *Lactobacillus plantarum* WCFS1 synthesize Gal- α -1,6 linked prebiotic α -galactooligosaccharide by transglycosylation. *Int. Journal of Biol. Macromolecules*, 2020, 144, 334-342. (IF: 4.784)

Published by

DIRECTOR

CSIR-CFTRI, Mysuru
director@cftri.res.in

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