



*International Virtual Conference*  
on  
**EMERGING TRENDS IN FOOD PROTECTANTS  
AND INFESTATION CONTROL**

organized at



On 24<sup>th</sup> and 25<sup>th</sup> February 2021



**Pesticide Science Study Group (PSSG) &  
Food Protectants and Infestation Control Department  
CSIR-Central Food Technological Research Institute  
Mysuru - 570 020, Karnataka, INDIA**



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डॉ. श्रीदेवी अन्नपूर्णा सिंह  
निदेशक

Dr. Sridevi Annapurna Singh  
Director



## Message

It is indeed heartening to note that **Food Protectants and Infestation Control Department** under the banner of **Pesticide Science Study Group (PSSG)** is holding a Virtual International Conference entitled “**International Virtual Conference on Emerging Trends in Food Protectants and Infestation Control-2021**” on 24<sup>th</sup> and 25<sup>th</sup> February 2021. The subject chosen for the conference is in line with the present day requirement. The invited speakers are experts with International repute in the field and I am sure this will lead to a healthy and good discussion. The platform is a wonderful learning curve for the students and faculties in the field of Pesticide Science. The final group discussion, I am sure, will lead to fruitful interface between academia and industries.

On behalf of CSIR-CFTRI, I welcome all the invited speakers and delegates to this conference. I wish a happy, fruitful and enduring scientific discussion in this conference.

From Team CSIR-CFTRI, our hearty wishes for the success of this Conference.



Dr.Sridevi Annapurna Singh  
Director  
CSIR-CFTRI, Mysore

Date: 23-02-2021

## MESSAGE



### **FOOD PROTECTION FOR FOOD SAFETY TOWARDS ACHIEVING NUTRITIONAL SECURITY**

The visible impact of India's much acclaimed progress in farm production sector of food grains by 5.6% times, horticulture crops by 10.5 times, fish by 16.8 times, milk by 10.4 times and eggs by 53 times between 1950-51 to 2017-18 has empowered Indians to be food secure by law. The resultant nutritional satiation to the vast majority of our population is no mean progress. The cutting-edge science and technology generation could be done in Indian Council of Agriculture Research along with research institutions in Central Scientific & Industrial research institutions and those R & D institutions of Department of Science & Technology and Department of Biotechnology and a host of Universities including IITs and IIITs.

Nutritional Security as envisaged in the UN Sustainable Development Goal No.2 and working towards achieving the set eight targets by 2030, there has been many government and non-government programmes designed to achieve the nutritional security of all our citizens. Securing the raw agriculture commodities (RAC) and food produced for consumption is valuable in securing the energy and investment for producing them and delivering to the consumers.

Components of managing RAC and the primary processed food from them have drawn wide attention of scientific, academic, policy and commercial institutions in the country. This International virtual conference on EMERGING TRENDS IN FOOD PROTECTANTS AND INFESTATION CONTROL is an event that would assess the present knowledge and technologies thereon to bring down emerging challenges of securing the precious RACs and processed food products from being damaged by both microbial and macrobial damage in transport, storage as well as in trade.

From the techniques of modified environment storage of RACs and processed food by utilising carbon di oxide or ozone well practised system to prevent serious loss of food safely has developed into fully structured business opportunity. The insects, mites, microorganisms etc. thrive well under specific moisture regime and their ecological succession in causing perishability to RACs in storage has been the world-wide concern. The UN-Food & Agriculture Organisation has provided the state-of-the-art guidance and technology support to nations to adopt good storage practices of RACs and processed foods. The net gain due to prevention of storage loss from various biological and abiotic reasons has been computed to be over INR 25 million annually in India. Catalysed by innumerable Food Business Start-Up companies under the patronage of government support and a new band of self-employment opportunity to farm families and business enterprises in rural setting would change the socio-economic outlook for achieving secure food.

This effort of CSIR-Central Food Technology Research Institute under its elite Food Protectants and Infestation Control Department to organise such an International virtual meet on the poignant theme: **Emerging trends in food protectants and infestation control** is valuable to guide the stakeholders with the principles and practice of safe custody of RACs and food prepared from them.

**Prof. T. P. RAJENDRAN**  
Formerly Assistant DG (Plant Protection), ICAR &  
OSD-Director, ICAR-National Institute of Biotic Stress  
management, Raipur (CG)



## MESSAGE

India produces over 280 million metric tonnes of food commodities per year. However, 10-20% of the commodities get destroyed by insect pests during storage. Though, several scientific methods are employed for the storage of the food commodities, most of the methods are found to be undesirable and cumbersome and pose a great risk to the environment. Eco-friendly biological methods have been proposed in the recent-past for effective management of stored grains. In addition, novel methods of detection of pesticide residues has assisted in rapid and sensitive detection to minimise the risk. A two-day international virtual conference has been organized by the Department of Food Protectant and Infestation Control (FPIC) of CSIR-CFTRI during 24<sup>th</sup> and 25<sup>th</sup> February, 2021 in collaboration with Pesticide Study Science Group (PSSG) with a theme on emerging trends on food protectant and infestation control, is an important milestone in this field.

A wide area of scientific theme is being presented in this two-day virtual event. These includes fumigants and chemical pesticides, bio-pesticides and phytochemicals, mycotoxins in stored food grains, etc. Other theme includes non-chemical method of grain storage, insecticides resistance studies as well as rodent control will be dealt.

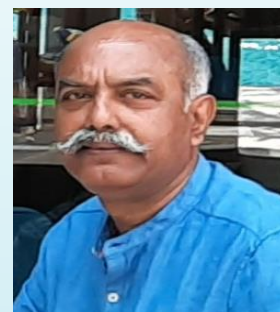


I express my sincere gratitude to Dr. Sridevi Annapurna Singh, Director CSIR-CFTRI for the encouragement and support for this event. I am also grateful to PSSG and team FPIC for their constant support. I am also thankful to the organizing committee members for making the preparations for the conference up to date. I am confident that the outcome of this event will help us to understand the research gap in the field of FPIC that will enable us to strengthen R & D in the departmental level in general and at the institute level in particular.



**Organizing Secretary, ET- FPIC-2021**

Dr. Prakash M Halami  
Chief Scientist and Head  
Food Protectants and Infestation Control Department  
CSIR-Central Food Technological Research Institute  
Mysuru - 570 020, Karnataka, INDIA.<sup>7</sup>



## FPIC the journey....

Food Protectants and Infestation Control (FPIC) is one of the oldest department of CSIR-CFTRI and was set up as Infestation Control and Protectants (ICP). When our Institution was born in the year 1950 with Dr. P.B.Mathur as the Head of the Department. In the year 1962 the department was elevated as a Division of Infestation Control and Protectants, the foundation was laid for a new building on the 27<sup>th</sup> October 1962 by Prof. Humayun Kabir, Minister for Scientific Research and Cultural Affairs and Vice-President CSIR, Government of India under the Head ship of Prof. S.K.Majumdar. From the date of its inception after Dr Mathur (1950-53), Dr. S.V.Pingale (1954-56), Prof S.K. Majumder (1956-84) Mr. M. Muthu (1984-85) Dr K Viseswariah (1986-90) Dr Krishnakumari (1990-93), Dr. NGK Karanth (1993-03), Dr. T. Shivanandappa (2003 –10), Sri John Pereira(2010- 2012), Sri Akmal Pasha (2012 – 2014), Dr Ramaswamy (2014-15), Dr Rajani (2015-17), Dr G Venkateswaran (2017-18) Dr. Alok Kumar Srivastava (2018), Dr R Sarada (2018-19), Dr Anu Appaiah (2019-2020) headed the department. At present Dr. Prakash M. Halami is heading as the 17<sup>th</sup> Head of the Department.

The Department was set up to with a motto to study and being innovation in the areas of

- Grain storage structures of all countries of third world.
- Pest Management methods of the world.
- In corporation of best and feasible methods for pest management

In addition to these major activities the department in the initial years were based on the requirement of the country, hence worked on

- Providing clean portable water at a affordable cost.
- Basic fundamentals of pest management to Food Corporation of India (FCI)
- Botanicals as pesticides based on traditional practices.



It was the initiative of ICP the behavioural studies of Rodents was carried out using I R during early 80's and studies on the insect behaviours inside the grain using soft X-ray during late 80's. these studies led to the development of basic fundamentals of Rodent and insect control mechanisms.

The Department was also in the forefront of developing anti-body and aptermer based methods for the detection of pesticide residues at ppb levels. When the first scientific panel on Pesticide and Antibiotic Residues in food was formulated by FSSAI, CFTRI was represented at the national level by an former student of ICP. Based on the requirement of the time at present the Department of FPIC is working on alternate technologies and combination strategies (AT& CS). The departments rich knowledge is the usage of botanicals lead to the development of first in the world a complete bio-based hand sanitizer using essential oils. At the Institute level the department initiated the first virtual work-shop from 21 to 22<sup>nd</sup> January 2021 due to the Covid-19 requirements and now the Virtual International Conference.

The department has produced a more than 1000 Research papers till date and is one of the major innovators in the field of physical, chemical and biological methods of stored pest management and pesticide residue analysis.

**Dr. ANU APPAIAH. K.A**

16<sup>th</sup> Head of the Department

President PSSG and Co-organising Secretary