

# Proceedings

National Workshop on

## NEW PERSPECTIVES IN RESEARCH AND DEVELOPMENT IN FOOD PROCESSING SECTOR

31<sup>st</sup> of July 2009

NEW DELHI

Organized by



Collaboration with



सत्यमेव जयते

**M F P I**

MINISTRY OF FOOD PROCESSING INDUSTRIES  
GOVERNMENT OF INDIA

## Proceedings

### National Workshop on **NEW PERSPECTIVES IN RESEARCH AND DEVELOPMENT IN FOOD PROCESSING SECTOR**

**FICCI** along with **MFPI** conducted national workshop on “NEW PERSPECTIVES IN RESEARCH AND DEVELOPMENT IN FOOD PROCESSING SECTOR” on 31<sup>st</sup> of July at Taj Man Singh Hotel, New Delhi. Addressing the workshop, Union Minister for Food Processing Industries Subodh Kant Sahai announced that new policy would be taken to chart a road map for the food processing sector and scale up research and development with the commercial orientation. The emphasis would be on the public private partnership (PPP) in the R/D sector area for technical capacity building to achieve the objective of processing of perishable items to 20 % by 2015. Mr. Sahai stressed that the government intends to train and empower five lakh women entrepreneurs. **FICCI Secretary General Amit Mitra** presided over the session. The Stage was set by **Mr. Rajeswara Rao**, joint secretary of ministry of food processing industries gave the presentation on new perspectives in research and development in food processing sector. He stressed that Research & Development in the processed food sector is related with improvement of grade, production, quality, consumer safety and public health, therefore it needs a highly focused attention. There is a need for up gradation of processing, handling, packaging, storage and distribution technologies for all major processed food products, so as to meet domestic & international standards. The workshop had three technical sessions consisting of experience sharing, opportunities and bottlenecks, and panel discussion on way ahead in relation to research and development.

## TECHNICAL SESSION 1

11.30 TO 13.00 HRS

## EXPERIENCE SHARING: ACADEMIA & INDUSTRY

1. **Mr. Vijayraghavan from Cornell University** focused on current key trends in global food research in Indian text. The trend which were discussed are

- Demographic factors.
- Convergent sciences create amazing innovations in value added foods.
- Research for mitigating food contamination and ensuring safety
- Addressing Nutrigenomics changes perspectives about food and health convergence
- The two most pressing global public health problems.

Talk focused on more research and development activities in institutions which can be accomplished by encouraging state of art research infrastructure for food science and food technology research, translational platforms – incubators, safety assessment centers, product validation labs et al for industry and public sector usage.

2. **Professor RK Saxena from Department of microbiology, University of Delhi** gave the presentation on enzyme mediated food processing. Which involved screening of microorganism for enzyme production having potential for various food processing operations like starch hydrolysis, oil and fat hydrolysis, milk and cheese processing. Financial assistance has been provided by the ministry and equipment like ferment or centrifuge, spectrophotometer has been purchased. The enzymes which are isolated are lipase, amylase, and protease. Glucose, peptone, sunflower oil, cocoa butter is used as substrate. *A.Carneus*, *T.Langinosus* undergoes downstream processing for investigating the enzymes. These enzymes have various applications such as flavor enhancers, food compatible emulsifiers.
3. **Dr Sunita Grover from National Dairy Research Institute** talked about PCR ASSAYS for detection of high risk pathogen in foods. Detection of pathogen in food is extremely important for risk assessment, quality management, HACCP. PCR assays are important tools for detection of salmonella, *listeria monocytogenes*, *Ecoli* to ensure their safety for local consumption and imports/exports. Biotech based industry has developed cost effective ready to use kits for large scale production to meet the local demand of food and clinical labs. Total Grant received from MFPI is Rs. 58 lakhs from which instruments like thermal cycler, real time PCR machine have been purchased. Issues to be taken up further are up gradation of food quality labs to handle molecular technique for rapid detection of pathogen in foods, creation of advanced referral lab for detection of dairy food pathogens and trained manpower. Strict enforcement of microbiological standards is essential. Protocol must be refined for each of the processed food .Validation study for new molecular diagnostic technique is important for monitoring food pathogens in foods. She requested Ministry of food processing industries to not only support the equipments but also help for employing manpower and purchasing consumables for proper execution of

projects. Future research should be focused on multiplexing and developing PCR ASSAY.

- 4 **Mr Madhav Kawatherkar from Nichrome India** shared the views on importance of aseptic pouch packaging in food processing which is ideal for plain UHT, milk, Butter, milk, Lassi. Aseptic packaging system is convenient to use, no refrigeration required, and no preservatives are added. Aseptic packaging system is ideal for promotion of perishable food products. Nichrome successfully commissioned the Aseptic milk plant in Maharashtra. Nichrome decided to join hands with Italian company Reda spa in setting up the plant .This system is flexible, economical and has low cost of logistics. Aseptic pouch packaging system is useful for tea packaging because bulk purchase saves the transportation and makes more no cups of tea per litre. He shared his experiences on developing aseptic pouch packaging system and how it is useful for enhancing the shelf life of milk products and being cost effective to the industry.
- 5 **Dr Vilas Shrihatti from Marico** talked about current and future challenges in technology development in food processing sector. He highlighted current status of Indian food processing industry and its rate of growth along with opportunities for all stakeholders in the areas of production, processing, marketing, supply chain, infrastructure development, technology up gradation and education. Several innovative technique like MAP, CAS, retortable pouches, extrusion, freeze drying, vacuum packaging. Lack of commercial-scale cultivation of raw materials, centralized regulatory system at the farm-gate level and the presence of too many middle men is a major problem in raw material sourcing since it is too scattered and leads to traceability issues. A daunting challenge is to meet the international quality standards, safety and hygiene standards like Sanitary and Phyto-Sanitary (SPS) rules and Vapour Heat Treatment (VHT) especially to build the export potential. This needs organizing our food processing industry to adhere to modern, scientific techniques. Dr Vilas Shirhatti compared the past, present and future food choices of the consumer and the variant life style .In the coming years the food industry will be dominated health foods, functional foods, food for special dietary uses, ayurvedic products, and dietary foods.

## TECHNICAL SESSION 2

TIME 14 .00 TO 15 .30

## OPPORTUNITIES AND BOTTLENECKS

- 6 **Dr Alagusundram Director, IICPT** gave the statistics on the total world food production by 2025 and explained the three pronged approach of saving food, increasing food production, and reducing population simultaneously. Main issues which nee to be taken up are

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| <ul style="list-style-type: none"> <li>• Scarce resources</li> <li>• Poor economies</li> <li>• Global warming</li> <li>• Environmental safety</li> </ul> | <ul style="list-style-type: none"> <li>• Sustainability in agriculture</li> <li>• Current scenario of Indian food processing industry is</li> </ul> |
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- characterized by Large Harvests
- Huge Losses
- Chemical residues
- Inadequate domestic supply
- Low processing rates

- Low export earnings

He highlighted different processing and preservation techniques applied to fruits and vegetables, grains like, irradiations, modified atmosphere storage, controlled atmosphere storage. Several novel technologies like high hydrostatic preservation, pulsed electric field processing, ohmic heating are being used in different food processing operations.

**7 Professor AK Sharma from BARC** talked about use of radiation technology in food processing operations. Use of radiations has several advantages like

- Non-residue forming
- Safety of workers & environment
- Can be applied to pre-packed commodities
- Can penetrate deeper in to tissues
- Cold process

KRUSHAK, Lasalgaon is an irradiation plant in which the commodities processed for large scale technology demonstration are

- Onion
- Garlic
- Potato
- Cereals & Pulses
- Spices
- Mango

Radiation Technology is also applied to some non food products like nutraceuticals, cut flowers, cattle, dog and pet feed, packaging material and containers. Use of radiation technology has several constraints like

### 1. Technological Challenges

- Dovetailing with trade practices
- Integration with packaging
- Ensuring incoming product quality (GAP/GHP/GMP)
- Post-processing handling and management

### 2. Plant Design & Engineering Choice of source

- Problems of material handling (large throughputs)
- Meeting wide product dose range
- Making economic and functional design

### 3. Safety & Security of facilities

- 8 Dr Ravinder Kumar from Danisco discussed about opportunities for R&D in Food Ingredients Sector.** He defined the food additive as any substance not normally consumed as a food by itself and not normally used as a *typical ingredient* of the food, whether or not it has nutritive value, the *intentional addition* of which to food for a *technological* (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food results, or may be reasonably expected to result, (directly or indirectly) in it or its by-products becoming a component of or otherwise affecting the characteristics of such foods. Importance of additives in food was discussed along with their nutritive value, and their effects in food processing operations. Consumer trend shows that there is an inclination towards natural foods with high nutritional value. The food ingredients market is increasing with a rapid growth rate, as consumers increasingly demand bigger, bolder tastes, foods that are healthy and ingredients that are natural or sustainable. Currently, going by the demand in the industry, emulsifiers, lactose and lactose syrup, molasses, seaweed extracts pectin and starches, tapioca, sago, arrowroot starch, rosin products, chickpeas and broad & horse beans, kidney beans, onions, tomatoes, garlic, carrots and olives, vegetable saps and extracts, are showing good growth.
- 9 Dr TSR Murali from Pepsico** focused on rate of production of milk, fruits and vegetable, poultry, in India and rate of food wastage in India. R/D can play a big role in developing diseases resistant varieties, developing products meeting consumer requirements, implementation of food safety standards, build India specific clinical trials data for functional ingredients. Research based development of Solutions to meet the Changing consumer needs talented scientist, infrastructure for basics science, research institutes. In India investment in R/D is much lower than other countries. Industry and academia should partner to build the research and development activities in food processing sector. Low cost technologies for storage and processing of agri produce should be used. Talent should be build for industry application development, clinical studies. Ministry of food processing industries has taken initiatives such setting of National institute of Food Technology Management Entrepreneurship and Management ( NIFTEM) .
- 10 Dr V .Satyanarayanan from Sipra Labs** spoke on bottlenecks for Research & Development in the Food Processing Sector. He highlighted the various key points like large consumption base, sea coastal yields, changing consumption patterns and lifestyles .New areas of research are radio frequency infrared detector, nanotechnology, GM Foods. Key constraints are lack of warehousing and storage , poor transportation facilities, lack of established quality control and testing infrastructure , innovative approaches, socio demographic profile along with cultural and dietary practices. Quality control labs should be established near the place of procurement of raw material. Innovative approaches should be used while packaging and storing the fresh produce. Rapid rest kits should be used for analysis of microbiological contaminants. No attempts are being made in India for exploring non conventional food items which are more popular among tribal areas. Good laboratory practices should be more emphasized. Packaging technology should be indianised for local foods. Government should bear the registration cost in other countries as national

brand. Preclinical safety profile should be designed for food products packaged in tin containers.

- 11 Dr RK Pal spoke** on key bottlenecks in R/D Sector. He discussed about the current scenario of Indian food industry along with its rank in terms of production, consumption, export. Challenges in this sector are skill and technology gap, lack of forward and backward linkages in the food chain, inadequate agricultural processing infrastructure. These bottlenecks can be combated by technology dissemination, speedy implementation, impact assessment, up scaling of technology, bottom up and need based approach, strong linkage between R/D and food industry personnel. APMC act should be revised. India is the largest exporter of cashew nuts and holds world record in production of grapes. India covers largest area in production of mango. India contributes 17 % in coconut production. Alarming situation for India is that India losses 10 % of food grain, 15% of pulse crop, 30 % of fruits and vegetables during processing operations. Restricted thinking leads to development of technology on laboratory scale.