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Symposium Report

Technical Workshop on Risk Based Approaches for Food Safety Management

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INTRODUCTION

India is one of the major food producers in the world. The rapid growth in the food industry has led to increased complexity across product design, supply chain and consumer habits. Food safety is the primary concern when preparing food commercially and it is the responsibility of every food business operator (FBO) to ensure they provide safe, wholesome food to their consumers as mandated by Food Safety and Standards Authority of India (FSSAI).

As with any material contacted or consumed, there are hazards associated with food ingredients around pathogens, toxic chemicals, allergens etc. Most of the current safety assessments conducted for food ingredients are hazard based and there is a need to adopt a risk based approaches. A risk based approach considers both the hazard and exposure scenarios and aids improvement of consumer safety decisions thus facilitating innovation. In India, risk based approach in regulation is under development and there is a need to create country capacity in the areas of food risk assessment and prioritize across specific areas such as food safety, food microbiology and chemicals (toxicology).

Unilever has the experience and expertise both in the areas of product safety and regulations associated with it at national and global level. To progress the initiative of creating expertise in risk based approaches for food safety Unilever organized a one day day training in the area of food safety associated regulations, food microbiology and toxicological assessment of food ingredients in partnership with the Association of Food Scientists and Technologists, India (AFSTI).

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The workshop targeted scientists, personnel from regulatory authorities and those involved in food safety audits. It was designed to:

- Provide an overview on the status of food safety and regulations in India and across the globe.
- To acquaint the institutions and personnel working on food safety with key scientific concepts and tools related to modern food safety management in industry.

The workshop was inaugurated by the Food Safety Commissioner; Karnataka Mr. VB Patil who highlighted the need for this workshop given the current regulatory scenario where the food authorities are keen to adopt the risk based approach, in line with global trends. He also, commended Unilever, AFST (I) and the southern based industries for having taken this initiative in creating awareness on this subject.

Manjunath G (President, AFST (I) - Bangalore Chapter) and Meghna Nanda Dasgupta (Regional Regulatory Affairs Manager, Unilever, South Asia, Foods) welcomed the delegates, introduced the objectives of the workshop to the audience and set the scene by highlighting the current regulatory scenario including issues faced by both regulators and FBOs.

This was followed by daylong technical sessions by the following experts.

TECHNICAL SESSIONS

Dr. Alok Kumar Srivastava (Head, Food Safety and Analytical Quality Control Laboratory; CFTRI), Presented on "food safety today - current scenario, regulations and

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issues" wherein he discussed the changing dynamics of food, food attributes and consumer perspective on food safety/quality thus emphasizing the need to update the regulations to meet the demands of the changing environment. The emphasis of the new food regulatory authority (FSSAI) towards safety includes food safety through risk assessment, risk communication and risk management to achieve appropriate level of protection to human health. Few of their other objectives include food safety and quality management necessity for FBO, food chain traceability and food recall, usage control and residue limits of food additives, pesticides, crop contaminants, heavy metals, myco - toxins, processing aids, pharmacological active substances etc., harmonizing the national food regulations and phyto-sanitary practices with CODEX Alimentarius and other international agencies. He concluded with the issues and challenges faced by the food authorities in implementing the food act/regulations.

Dr. KS Rao (Senior Research Director and Head of Safety Assessment, Syngene International Ltd.) presenting on "food toxicology (chemicals and contaminants in food)" explained the fundamental composition of food and the process of ensuring the safety of all the approved chemicals/additives that are added to processed foods. He discussed the different categories of chemicals that can be present or can be added to foods (preservatives, flavours, texture, colours, nutritionals and miscellaneous including processing aids). Explaining the various hazards associated with these additive and ingredients, Dr. Rao gave a brief description of the toxicity tests and methods to assess the safety of food ingredients.

Dr. Shashikanth (Ex-Britannia, Consultant) in his presentation on "microbiological hazards and mitigation in food industry" highlighted the importance of microbiological safety from farm to fork. The current strategies for microbial control/preservation include cleaning and sanitation practices, removing or controlling microbes by using heat, modified atmosphere, use of preservatives, radiation etc., but newer technologies are being continuously explored such as long-wave electromagnetic waves, ohmic heating by electric currents passed through food, pulsed electric fields, high-hydrostatic pressure processing, all high-energy, short time exposures to name a few. The speaker also demonstrated the way to apply the microbial risk based management approach in practice.

Dr. Adip Roy (SEAC, Unilever R and D) and Meghna Nanda Dasgupta (Regulatory Affairs, Unilever R and D), using various case studies presented on the risk based approaches for food safety. They explained the different steps of risk assessment viz. Hazard identification, hazard characterisation, exposure assessment and risk characterisation. Emphasizing that risk is a function of hazard and exposure, the four steps of risk assessment helps in the safety assessment and identification of a safe level of food ingredient which can be consumed. Their presentation also covered some modern tools and concepts like "history of safe use", threshold of "toxicological concern" and "post-launch monitoring" which aid in the process of risk assessments.

Dr. Satish Kulkarni (Head, National Dairy Research Institute) presented on the risk based approaches for dairy products. Dr. Kulkarni mentioned that although there are regulations existing to ensure safety of milk and milk products; milk production and processing are critical for its safety. Microbial contamination affects the quality and safety and several pathogenic bacteria, viruses and rickettsia can contaminate milk if unhygenically produced. He also highlighted issues of contamination of milk by metals, additives and migrants from packaging during the processing of milk.

Ms. Nirmala Ronnie (SEAC, Unilever) presenting on "Risk Based Approaches for Water", explained that unsafe water is the leading cause diarrheal and communicable diseases in India. She mentioned that there are several points of contamination (by bacteria, viruses and parasites) of drinking water viz., during catchments, treatment and reticulation. An integrated risk assessment approach in a single framework consisting of hazard identification, hazard characterisation, exposure assessment (pathogen density and water consumption) and risk characterisation helps in assessing the safety of drinking water.

Mr. Satya Pradeep Pulakurthi (Ex Pepsico; Consultant) covered the risk based approaches for "high moisture foods" and explained that a proper supply chain is critical for such foods. Outlining the hazards affecting such foods, he explained that microbial hazards (pathogens like *Salmonella*, *Escherichia coli*, *Clostridium, Cryptosporidium* etc.), chemical hazards (pesticides) and physical hazards need to be controlled for high moisture foods.

Ms. Anupriya Gulhane (Novozymes) talked on the risk based approaches for "frozen foods." As preservation, increasing shelf life and maintaining quality are the advantages of freezing; the hazards around frozen foods are harvesting, handling, storage procedures and poor process hygiene. She mentioned that faults in temperature controls and packaging flaws also increase the risk of contamination. Supply chain risks (viz., transportation temperature, ware house temperature and power failures) and risks at the consumer end (transport, storage and thawing) can also comprise safety of frozen foods.

Dr. Mridul Sangame (Food Safety Consultant), talking on "risk based approaches for meat and poultry" presented the differences in the traditional and modern food safety approaches which clearly demonstrates the shift from a reactive, unstructured approach to a preventive, science

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based, structured risk analysis of the food product in a bid to ensure its safety. The incidence of food borne illness is very high in India which makes it imperative to undertake a comprehensive microbial risk assessment in meat and poultry products which are categorised as high risk. In addition to microbial concerns, there are other hazards that need to be taken into account such as veterinary drug residues, fertilizer and growing aids, pollutants, pesticide residues, animal feed additives etc., during the risk analysis of such products.

CONCLUSIONS

The rapid growth in the food industry has led to increased complexity across product design, supply chain and consumer habits and demands stringent risk assessment processes for assuring safety of the food products. Although science based preventive systems such as good manufacturing practices, good hygiene practices and hazard analysis and critical control points exist, which can achieve a very high level of safety, the risks associated with the presence of microbes, chemicals, processing etc., also needs to be managed effectively.

In many regions across the globe, most of the current approaches used to assess the safety of food products continue to be hazard based and there is a need for a shift toward a risk based process. Risk-based approaches are increasingly being discussed at various food safety forums across the country. The transition from prevention of adulteration to a holistic food safety management system under the new Foods Safety and Standards Act is in the interest of public health. This symposium attempted to address the need to create capacity in the area of food safety risk assessment and the use of risk based approaches to food safety management through presentations on managing hazards and analyzing risks by experts in the area of toxicology, microbiology and process safety.

It was concluded that there is a significant need for experts in the food industry to create awareness and train the relevant personnel in the regulatory bodies and academecia in risk based approaches. The FSSAI objective of moving towards this approach can only be realised by building this capability within its organisation. This is one of the steps that India needs to take to align to global practises and ensure that its regulations have a strong scientific base.

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