



CSIR - INDIAN INSTITUTE
OF TOXICOLOGY RESEARCH



COUNCIL OF SCIENTIFIC
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Golden Jubilee Lecture

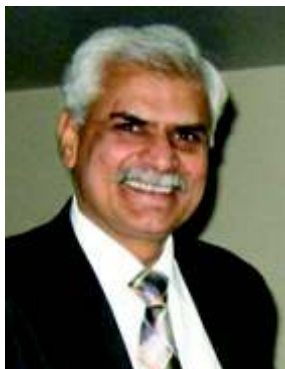
September 21, 2015

Professor R. K. Khandal

President R&D, India Glycols Ltd, Noida
Former Vice-Chancellor
UP Technical University, Lucknow



50 Years of Service to the Nation



Professor (Dr) R. K. Khandal

Professor (Dr) R.K. Khandal, former Vice-Chancellor, Uttar Pradesh Technical University, is a Fellow, The Royal Society of Chemistry, London. He was unanimously elected President, WAITRO (World Association of Industrial & Technological Organizations), a UN body, having more than 180 Research & Technological Organizations as its members from 80 countries, for the periods: 2010-2012 and 2012-2014. He went for advanced research as a UNIDO fellow to U.K. and as an invited guest scientist to France. Later, he joined as the President R&D and Business Development, India Glycols Limited, Noida.

Professor Khandal started his career in 1982, as a Lecturer in the Indian School of Mines, Dhanbad and went on to become the Vice-Chancellor, Uttar Pradesh Technical University, Lucknow. His contributions towards raising the standards of technical education in India have been transforming the output based education to outcome based education.

He has vast experience in research and development, industrial research and setting up of sustainable projects. For about ten years in the industry developing technologies and eleven years as Director of an international research institute of repute of its kind, managing teams of experts in nano - sciences, analytical sciences, green building technologies, renewable energy, pesticide formulations, food processing, polymers etc in various fields. He is an expert of radiation processing technology, environment protection methodologies, optical plastics, metal-containing polymers, fluoro-polymers, natural polymers, derivatization of polysaccharides, food-safety management, validation of new products and processes, waste management technologies etc.

Professor Khandal has supervised 30 Ph.D. students and has been successful in commercialization and transfer of several of his technologies to the industry. He has 14 international patents to his credit, published more than 125 research papers in peer reviewed journals and more than 100 articles, five books and edited two books.

Professor Khandal is a highly acclaimed innovator. He is a recipient of several awards, some of them are: INSME International award for innovation; R.N. Bangur Memorial award for novel technologies; R.G. Deshpande award for popularization of Radiation processing technology; U.P. Ratna Award, 2014 for Transforming the Standards of Technical Education in India; Rajasthan Samman Award from Rajasthan Association of Universities; Meri Dilli Award for contribution towards improving the living standards of citizens of Delhi; Srishti awards for green technologies, waste management and environment protection, Amity Academic Excellence award for pioneering research and academic excellence, AMAR UJALA Excellence Award for outstanding contribution to education, Life time achievement award by World Environment Congress in food preservation, safety, environment protection and renewable energy, Eminent Engineers Award by Institutions of Engineers, International Academic Excellence Award from Eye Watch, India, at Singapore.



Food Safety: Challenges and Opportunities; An Indian Perspective

Professor (Dr) R. K. Khandal
President
R&D and Business Development
India Glycols Ltd, Noida

Food safety has already become synonymous with food quality. This is evident from the fact that no longer the food regulators focus on the conventional parameters pertaining to the purity and constitution of food now-a-days but the emphasis is on the control of impurities with the aim to keep the undesired impurities (contaminants) well below the maximum allowed limits. Either contaminants or the remnants (residues) of various materials used during production must not be exceeding the limits called the maximum residue limits (MRL). With the increasing awareness about food safety, enhancement of knowledge about toxicity as also safety and advancements in communication technology, the list of impurities (contaminants as well as residues) to be monitored has been getting longer with time. Additionally, the MRLs for each of the toxicants to be monitored has been getting more and more stringent. Till the other day, the MRLs were prescribed at the higher ppm levels but now with the advancements in technology the MRLs have been brought down to sub-ppb levels or at the ppt levels. Moreover, for some of the chemical residues, the MRLs have been also prescribed as 'Absent'. Whether the presence of the toxicants at such low levels is detrimental for health or not is the question often asked by almost all the countries which are adversely affected due to such developments. In fact, it is sometimes taken by the exporters as the tactics of the developed-world (importers) to create trade barriers for the food products coming from developing countries (exporters). The global food trade is driven more by safety aspects than by the nutritional aspects. All this has presented several challenges for the exporters. Incidentally, the importing countries are mostly from the developed world where as the exporting countries are from the developing world. This means that the challenges are more difficult for the exporters aiming to capture the global food market. Those who are able to overcome the challenges find a lot of opportunities for themselves from the existing as well as the emerging scenario of food trade driven by the criteria of compliance of food safety norms. The existing challenges include mainly the aspects of analytical method development and the method validation, use of confirmatory techniques, fixing MRLs for the presence of various contaminants and the toxicants, use of right kind of packaging etc for the quality control purposes. But for the quality assurance, the challenges would include the aspects pertaining to the process validation, traceability, quality assurance, implementation of systems etc. The present paper deals with different aspects of challenges of food safety. It also highlights the emerging trends of food safety in India while indicating the path forward to convert challenges into opportunities for the Indian food industry.





CSIR-INDIAN INSTITUTE OF TOXICOLOGY RESEARCH (COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH)



CSIR-IITR, Lucknow is the only multidisciplinary research institute in the field of toxicology in South East Asia with the motto:

Safety to Environment & Health and Service to Industry

R&D Areas

- Food, Drug & Chemical Toxicology
- Environmental Toxicology
- Regulatory Toxicology
- Nanotherapeutics & Nanomaterial Toxicology
- Systems Toxicology & Health Risk Assessment

Services Offered

- GLP certified for pre-clinical toxicity studies
- NABL accredited
- Safety / toxicity evaluation of NCEs
- Water quality assessment and monitoring
- Analytical services
- Environmental monitoring and impact assessment
- Epidemiological studies
- Information on chemicals / products

Recognitions

- Scientific & Industrial Research Organizations (SIROs)
- UP Pollution Control Board (Water & Air)
- Indian Factories Act (Drinking Water)
- Bureau of Indian Standards (Synthetic Detergents)
- Food Safety & Standards Authority of India (FSSAI)

Technologies Developed / Available

- Water Analysis Kit
- Mobile Laboratory Van for on spot water quality analysis
- Argemone Detection Kit for rapid screening of Argemone in mustard oil
- CD-Strip for detection of butter yellow, an adulterant in edible oils
- Arsenic Detection Kit



Director

CSIR-Indian Institute of Toxicology Research
MAHATMA GANDHI MARG, POST BOX NO 80,
LUCKNOW-226001 (INDIA)

+91 522-2621857, 2613357
director@iitr.res.in

Fax: +91 522-2628227
www.iitrindia.org



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