

INVITED LECTURE 2 [INVL2]



Title: “From food microbiological analysis by culture to the liberation of DNA sequencing and beyond: Developments, challenges and future trends in reference methods and industry standards”



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Abstract: Rapid developments in sequencing technology along with falling cost brought widespread opportunities and changes in food microbiological analysis. Long term established practices and analytical ‘gold standards’, such as food analysis by culture and microbiological typing with PFGE or MLST, change or could be made redundant. The completion of the human genome draft back in 2000 required a decade of international collaboration and billions of dollars, however, nowadays bacterial genomes can be sequenced in hours for less than \$100 with what is collectively termed as ‘next generation sequencing’ technology. The increasing accessibility to sequencing whole genomes and ability of laboratories to identify, and differentiate bacterial and viral strains, reform the practice and expectations in managing quality and safety in food industry. While next generation sequencing is still shaping, 3rd generation sequencing is in progress and bringing ultimate portability.

Further emerging technologies such as user-friendly bioinformatics software tools, next-generation robotics, novel sensor materials and drones, start making their way to food analysis applications. While government authorities and global industries have taken initiative, the majority of food industry lacks awareness and capability to fully understand the benefits, issues and future challenges in the changes of conducting food microbiological analysis.

The lecture will attempt a review of practices and methods that underlined the industry microbiology standard up to date, recent developments that change the way of work and coming technological opportunities and challenges that are expected to shape the future.