Next Generation Food Industry; From pH and microbial measurements to Data Science and Web Platform Approach

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ABSTRACT

Food management safety and/or quality systems are probably the main challenges of the agri-food industry that are expected to be addressed in the current environment of tremendous technological progress, where consumers' lifestyles and preferences are in a constant state of flux. Food chain transparency and trust are drivers for food integrity control, improvements in efficiency, and economic growth.

Throughout the food chain cycle, all food commodities are exposed to biological or chemical hazards at any stage of food production, whether accidentally introduced or fraudulently imposed, risking consumers' health and their faith in the food industry. The current safety and quality controls in the food chain are lacking or inadequately applied and fail to prevent microbial and/or chemical contamination of food products, which leads to reduced confidence among consumers.

The envisioned approach consists of a framework of toolsets and methodologies to provide sustainable solutions in food processing, packaging, across the food value chain to address food shelf-life increase & waste reduction holistically. The proposed solutions is based on the microbiome, microbial activities, and technology hubs to address food, health, economic, and environmental challenges.

These new approach will generated, massive amount of data not only due to monitoring systems along the entire food chain (primary production included) but also from the Internet of Things, media, and other devices. These data should be used for the benefit of society, and the scientific field of data science should be a vital player in helping to make this possible.

However, the production, supply, and processing sectors of the food chain are fragmented, and this lack of cohesion results in a failure to adopt new and innovative technologies, products, and processes. The potential of using information technologies, i.e., data, network communication, in tandem with data science, e.g., data, big data, AI/ML, statistics and probability, etc., through the whole food chain, including processing within the food industry, retailers and even consumers, will provide stakeholders with novel tools regarding the implementation of a more efficient food safety management system.

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