

Special Issue on

Digital Transformation in Food Processing: From Industry 4.0 to Industry 5.0

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The global food processing industry stands on the cusp of a profound digital transformation, transitioning from the principles of Industry 4.0 to the broader framework of Industry 5.0. This is set to revolutionize the way food is processed, with the integration of cutting-edge technologies such as the Internet of Things (IoT), artificial intelligence (AI), and blockchain, among others. These innovations promise to streamline operations, enhance product quality, and reduce waste, but they also bring forth a host of challenges. These challenges include the complex task of integrating disparate technologies, data security and privacy concerns, workforce development, and the need to ensure a human-centric approach in the age of automation. Furthermore, this transformation must address the food industry's environmental impact and sustainable practices, making it a pivotal juncture for the industry and society as a whole.

Navigating this digital frontier is not without its obstacles. The integration of diverse technologies and equipment from various vendors presents a formidable challenge, requiring innovative solutions for seamless coexistence. Moreover, the sheer volume of data required for AI and machine learning models necessitates advanced data management strategies. Security and privacy concerns loom large, as food processing becomes increasingly reliant on interconnected systems. The industry must also grapple with workforce development, equipping professionals with the skills required for this new era, and ensuring that human well-being remains at the forefront of digitalization efforts.

This Special Issue aims to delve deep into the heart of these challenges while offering a beacon of guidance toward an inclusive, sustainable, and innovative future for food processing. Our objectives include exploring strategies for effective technological integration, proposing solutions for secure data management, addressing workforce development needs, and championing a human-centric approach to innovation. Additionally, we seek to shed light on the potential for digitalization to contribute to environmental sustainability within the food industry. Through expert insights and visionary outlooks, this Special Issue strives to provide a comprehensive roadmap for navigating the digital transformation of food processing, ensuring that the industry not only keeps pace with technological advancements but also leads the way in addressing societal issues and promoting sustainability. We welcome both original research and review articles.

Potential topics include but are not limited to the following:

- ▶ Interconnected technologies to explore the integration of IoT, AI, and blockchain in food processing operations
- ▶ Data management and analytics for enhanced decision-making and efficient handling and analysis of digital food processing data
- ▶ Security and privacy in a digitally connected food industry
- ▶ Investigations of the skills and training needed to evolve the workforce for digitalized and automated food processing
- ▶ Human-centric design approaches in food technology to prioritize human well-being, inclusivity, and user-friendliness
- ▶ Contribution of digital innovations to sustainable practice and the reduction of the environmental impact of food processing
- ▶ Innovation pathways for resilience, considering consumer preferences, health, and workforce changes
- ▶ AI Applications to enhance food quality, safety, and sensory preferences
- ▶ Real-world examples and lessons learned from successful digital transformations in food processing
- ▶ Discussions of the potential societal benefits of transitioning from Industry 4.0 to Industry 5.0 in food processing
- ▶ Use of digital technologies to mitigate the environmental impact of food processing through the reduction of resource consumption, waste, and carbon footprints
- ▶ Enhancing supply chain resilience and traceability
- ▶ The role of collaboration between universities and the food industry in workforce development and innovation
- ▶ Ethical considerations in digital food processing, such as data usage, robotics and automation, and workforce impact
- ▶ How digitalization can enable personalized and consumer-focused food processing and product development

Authors can submit their manuscripts through the Manuscript Tracking System at <https://review.wiley.com/submit?specialIssue=650822>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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