

Abstract

# A Mechanism to Detect Food Safety Threats Using IoT and C-LSTM: An Enhanced Approach for Farmwork<sup>†</sup>

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This research aims to explore the potential of machine learning techniques in enhancing the productivity of high-quality food products. By integrating machine learning algorithms into food production processes, this study seeks to optimize efficiency, minimize waste, and improve the overall quality of food items. Through the utilization of predictive analytics, anomaly detection, and optimization algorithms, the research endeavors to enhance production output, reduce costs, and meet the demands of consumers for premium food products. The incorporation of machine learning in food manufacturing holds promise for transforming production practices, ensuring consistency in product quality, and fostering innovation within the industry.

The proposed system utilizes a diverse range of sensors and Internet of Things (IoT) devices to monitor the entire food supply chain, from the farm to the consumer's plate. These sensors collect various data elements, such as temperature, humidity, and other environmental conditions that may impact the quality and safety of the food. Subsequently, this gathered information is fed into a Convolutional Long Short-Term Memory (Convolutional-LSTM) machine learning model, which employs multiple algorithms to analyze the data and identify any potential threats to food safety. Moreover, the model has the capability to predict the likelihood of food contamination and spoilage based on various criteria, including temperature, duration, and storage conditions. In times of a pandemic, this proposed system could aid food safety authorities in promptly recognizing and responding to any threats to food safety, thereby safeguarding the integrity of the food supply chain and upholding its high standard of quality.

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