

Abstract

Assessing Quality of Food Products Using Electronic Noses: A Systematic Review [†]

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In the global food industry, companies face various challenges, including the need for innovation to keep up with competition, expanding into new markets, and satisfying the ever-changing demands of consumers. Our senses of smell and taste provide invaluable insights into the analysis of various food products, beverages, and their combinations. Mimicking the biological function of the mammalian nose, the electronic nose (e-nose) emerges as a revolutionary technology. It utilizes an array of chemical gas sensors that interact with odor molecules, generating signals that are then transmitted to a computer. Through pattern recognition methods, the computer figures out patterns and details in the smells, just as our brains understand different scents. A systematic review of the research literature was conducted, identifying 14 articles that fit the inclusion criteria, which were then analyzed. Only studies focusing on food products published after 2013 were included. Most of these studies found that homemade e-noses were successful in quality analysis. The findings indicate that sensor-based electronic nose systems can effectively assess the quality of food products. Furthermore, they suggest that these systems can also be used for freshness assessment, quality control, and process monitoring. By leveraging e-nose technology, food companies can enhance their efficiency, reduce waste, and maintain consistent quality standards across their product lines. However, despite its promise, the widespread adoption of e-nose technology in the food industry faces significant challenges. These include the need for further refinement to enhance accuracy, reliability, and versatility, as well as addressing cost concerns and regulatory hurdles. Overcoming these obstacles is crucial to unlocking the full potential of e-nose technology and realizing its transformative impact on the food industry.



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