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Review of technology advances to assess rice quality traits and consumer perception

Abstract

The increase in rice consumption and demand for high-quality rice is impacted by the growth of socioeconomic status in developing countries and consumer awareness of the health benefits of rice consumption. The latter aspects drive the need for rapid, low-cost, and reliable quality assessment methods to produce high-quality rice according to consumer preference. This is important to ensure the sustainability of the rice value chain and, therefore, accelerate the rice industry toward digital agriculture. This review article focuses on the measurements of the physicochemical and sensory quality of rice, including new and emerging technology advances, particularly in the development of low-cost, non-destructive, and rapid digital sensing techniques to assess rice quality traits and consumer perceptions. In addition, the prospects for potential applications of emerging technologies (i.e., sensors, computer vision, machine learning, and artificial intelligence) to assess rice quality and consumer preferences are discussed. The integration of these technologies shows promising potential in the forthcoming to be adopted by the rice industry to assess rice quality traits and consumer preferences at a lower cost, shorter time, and more objectively compared to the traditional approaches.

Keywords

Artificial intelligence; Biometrics; Computer vision; Digital sensors; Sensory analysis