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REVIEW PAPER

Fresh vegetables as a source of *Escherichia coli* bacteria and application methods limiting the occurrence of microbial contamination*

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Abstract

Growing consumer awareness of the health aspects of a diet has contributed to greater consumption of vegetables. However, vegetables, particularly leafy greens, are often consumed raw or undergo minimal processing, which may not adequately eliminate microbial contaminants. Therefore, vegetables can become a source of infection and transmit foodborne pathogens causing food poisoning in humans. Among these microorganisms, *Escherichia coli* is of particular concern because it possesses various mechanisms that enable it to colonize plant surfaces and tissues and persist in the vegetable production chain. To prevent microbial contamination, the microbiological quality of raw materials must be safeguarded during primary production. It is essential to maintain appropriate sanitary conditions and cultivation practices during the primary production of vegetables in order to avoid microbiological contamination and ensure high quality of raw material. The aim of this study was to review the current state of knowledge regarding the prevalence of *E. coli* in vegetables. Attention is paid to sources of the contamination during cultivation and also to mechanisms by which these bacteria adapt to colonize plants. Pre- and postharvest control methods are demonstrated, e.g. organic acid sanitation, lactic acid bacteria application or sonication. These methods are included in the One Health approach, which recognizes the interconnectedness of human, animal, plant, and environmental health and provides an integrated framework for addressing complex challenges such as climate change, food security, and infectious diseases. The scientific relevance and novelty of the work lie in its multifaceted approach to the survival of *E. coli* bacteria on vegetables, taking into account the influence of atmospheric, agronomic and environmental factors in the context of sustainable agriculture, where food safety is a priority.

Keywords: food safety, primary production, good agricultural practices, lactic acid bacteria, leafy vegetables

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