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Food Contamination and Its Implications for Food Safety

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Abstract

Food contamination refers to the presence of harmful biological, chemical, or physical substances in food that can compromise safety and quality. It poses serious risks to public health and food security worldwide. Contamination can occur at any stage of the food supply chain, from production to consumption. This article discusses the causes of food contamination and its impact on food safety systems.. This article discusses the importance of probiotics and prebiotics in modern nutrition and food science. This article discusses the role of food biotechnology in modern food science and its contribution to sustainable food production. Improper post-harvest practices can lead to significant food losses, reduced nutritional value, and economic challenges. The application of appropriate post-harvest technologies enhances food safety, extends shelf life, and ensures year-round availability of food products. This article discusses the role of post-harvest technology in improving food quality and reducing post-harvest losses.

***Keywords:** Food contamination, Food safety, Chemical hazards, Biological hazards, Food quality*

Introduction

Food contamination occurs when food is exposed to harmful microorganisms, toxic chemicals, or physical hazards that render it unsafe for consumption. Sources of contamination include environmental pollution, agricultural practices, industrial processing, and improper food handling [1]. Understanding these sources is essential for developing effective prevention strategies.Biological contamination from bacteria, viruses, and parasites is one of the most common causes of foodborne illness [2]. Chemical contamination may result from pesticide residues, heavy metals, and industrial pollutants entering the food chainAdditives can be derived from natural or synthetic sources, depending on their intended application and regulatory approval. Preservatives are among the most widely used food additives, as they inhibit microbial growth and delay spoilage in perishable foods [2]. Chemical indicators such as lipid oxidation and enzymatic activity also play a significant role in determining shelf stability, particularly in fat-rich and processed foods [3]. Sensory evaluation complements analytical methods by assessing consumer acceptability in terms of taste, odor, color, and texture [4]. Shelf-life studies are also important for regulatory compliance, as food manufacturers must provide accurate expiration dates and storage instructions based on scientific

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evidence [5]. Together, these approaches ensure that shelf-life evaluation supports food safety, quality control, and consumer trust.

Conclusion

Food contamination poses a significant threat to food safety and public health. Through preventive measures, scientific monitoring, and regulatory enforcement, contamination risks can be effectively controlled. Continued research and integrated safety systems are essential for maintaining safe and high-quality food supplies. Food additives play a significant role in improving food quality, safety, and shelf life in modern food systems. When used responsibly and regulated effectively, they contribute to product stability and consumer satisfaction. Ongoing research and regulatory oversight are essential to ensure the safe and beneficial use of food additives in the global food industry.

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