Safety of microbiological food and methods for detecting foodborne microorganisms.

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Abstract

Numerous diseases have been linked to foodborne microorganisms, particularly in developing nations. This has a significant economic effect. It's critical to keep them under control, and early detection is essential for doing so. Initially relying on culture-based techniques, detection and diagnosis have advanced recently in tandem with the development of immunological techniques like Enzyme-Linked Immunosorbent Assays (ELISA) and molecular biology-based techniques like Polymerase Chain Reaction (PCR). Finding an efficient, quick, sensitive, and precise procedure has always been the goal. These techniques, which range from the cultivation of microorganisms to cutting-edge biosensor technology, all had the same objective.

Keywords: Foodborne pathogens, Human health, Food safety management.

Introduction

Foodborne pathogens are responsible for a wide range of illnesses with serious consequences for both human health and the economy. The characteristics of the most prevalent pathogenic bacteria, viruses, and parasites, along with some significant outbreaks, are *Bacillus cereus*, *Campylobacter jejuni*, *Clostridium botulinum*, *Clostridium perfringens*, *Cronobacter sakazakii*, *Escherichia coli*, *Listeria monocytogenes, Salmonella spp*., *Shigella spp*., *Staphylococccus aureus*, Vi The traditional hazard-based approach to food safety management systems has been shown to be ineffective, and top experts and organisations are now recommending a risk-based approach [1].

The human body contains harmless microorganisms, primarily bacteria, as part of the regular flora in the gut and on the skin. These microorganisms aid in many vital bodily processes. However, there are several microorganisms that are harmful, such as bacteria, fungus, and viruses. Pathogens can enter the body through the digestive tract and cause a variety of foodborne illnesses. Both polluted and undercooked food and contaminated water can harbour foodborne diseases. In order to prevent a catastrophic outbreak, it is crucial to identify pathogens in food and water before they are ingested [2].

When a pathogen is consumed with food and becomes established (and typically multiplies) in the human host, or when a toxigenic pathogen becomes established in a food product and creates a toxin, which is subsequently consumed by the human host, foodborne disease results. Foodborne infection and foodborne intoxication are the two general categories for foodborne sickness. Since an incubation period is typically involved, foodborne infections typically take far longer than foodborne intoxications for symptoms to manifest after consumption [3].

No matter the location, it has been observed that foodborne bacteria can cause serious epidemics. Disease spreads as a result, especially among young children and the elderly. Therefore, quick detection becomes crucial to stop the pathogen's transmission before it causes a catastrophic outbreak. To find the pathogens that cause food poisoning, various approaches have been developed. It has been a constant process to try to make detecting systems better. The detection techniques have been divided into various categories along with their guiding principles, benefits, and drawbacks, the majority of which are covered in this review. Each technique is accompanied by appropriate examples to help the reader better comprehend how the detection systems have evolved through time [4].

Food items may become contaminated while being prepared, stored, or distributed by food handlers, as well as in the vessels used in these operations. There was no way to cultivate the food samples. A faeces sample was examined in a lab and food workers were given a physical examination. There were no encouraging results [5].

Conclusion

The detection and control of all new foodborne problems that endanger human health and international trade require a coordinated and cooperative effort from all nations and the pertinent international bodies. Even though their biology, analysis, and epidemiology are complex, the majority of

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foodborne infections are avoidable. It is unquestionably necessary to combine knowledge and abilities from several areas. To prevent food contamination on farms, during processing, in restaurants, and in homes, public health organisations, regulatory authorities, the food business, and consumers must continuously work to prevent it. The number of cases of foodborne illnesses could be reduced with appropriate education initiatives for everyone involved.

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