

# Chapter 3

## Rapid and Non- Invasive Techniques: Opportunities and Challenges to Authenticate Food Safety Issues in Restaurants

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### ABSTRACT

*In this modern era of digitalization and consumer awareness regarding food safety issues, it has become important to build proper strategies that can ensure the quality and safety of the food items from farm to forks. People love to eat at restaurants not only during business meetings but also with their family for fun and entertainment. The choice and safety of the food is vital to attract the consumer in this competitive*

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*environment. Previously, conventional methods have been employed for assurance of quality and safety parameters of the food. But in this modern era, there are many potential alternatives that can serve the purpose rapidly and non-destructively. Hence, this chapter describes the rapid and non-destructive methodologies such as fluorescence, NIRS, MIR, and Raman spectroscopy that can be used for the food safety evaluations.*

## **INTRODUCTION**

Due to advancements in modern technologies and consumer awareness about the foods and their ingredients, it has become important to ensure the quality and safety of the food items. Food quality and safety are the important criteria that help for the selection of the food that the consumer eats. If they eat low quality and substandard food products then they will suffer from different ailments and become a burden not only on their loved ones but also on society. Therefore, the government and the consumers are focusing on the quality and safety of food products. It is an important tool to ensure the quality of life and a way to compete with their market competitors.

Food safety and quality of any substance are distracting by the presence of any hazard or foreign particle. There are three types of hazards (physical, chemical and microbiological) that may be present in the food. These hazards may come in contact with food through contamination, mishandling unhygienic and poor sanitary practices during handling, processing, storage and serving of food. The ingestion of such hazards present in the food may lead to illness. There are intrinsic and extrinsic sources of these hazards (Edwards & Stringer, 2007). The intrinsic source of physical hazards includes fruit stalk in dried fruits as well as the presence of bone in boneless meat products. The extrinsic sources of physical hazards are glass, rubber or metal etc. The presence of a foreign body in food may be a risk factor that is dependent on the size, shape, type, hardness and sharpness of the object. The existence of external hazards in food leads to choking as well as in few cases surgery may be required to remove these foreign objects from the body (Bansal, et al., 2017; Hyman, et al., 1993; Olsen, 1998). In addition to this, chemical and biological hazards are more problematic as one cannot see them with a naked eye and the presence of such hazards in the food may seriously damage nutritional, organoleptic and textural characteristics. The ingestion of such hazards may lead to food poisoning and severe physiological damage, which ultimately reduce one's immunity.

Food industries and foodservice sectors such as hotels and restaurants are very conscious about the product. The restaurants receive raw and processed materials. The raw materials include meat and fresh produce such as fruits and vegetables.

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