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Nanoscience in Food and Agriculture

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Namita Ashish Singh and Pradeep Kumar

Abstract Nanosensors are being used globally due to its specific features over the traditional methods. In this chapter we have emphasized on the need of nanosensors and their applications in various fields i.e. food industry, medicine and agriculture. In the food sector we have highlighted the use of nanomaterials in food packaging, food processing and food quality as well as safety. The next section describes the applications of nanosensors in the medicine for the detection of diseases namely diabetes, asthma, cancer etc. and targeted drug delivery. In agriculture nanosensors/nanoparticles are used for crop protection against various plant pathogens and pesticide detection. Further, in nanotoxicology section we have discussed the various routes through which nanomaterials enter into environment. Toxicity of nanomaterials on various organs i.e. respiratory system, gastrointestinal system, cardiovascular system, central nervous system and skin are also discussed in the last section.

Keywords Nanosensors · Nanomaterials · Nanotoxicology · Food · Medicine · Agriculture

1.1 Introduction

Nanotechnology is the use of nanomaterials in different areas for the human benefit. Nanomaterials are used for the novel sensing and monitoring size and unique properties at nanoscale (Singh 2017). The main aim of nanosensors is to measure any chemical, mechanical and physical changes which are related to an indicator of

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