NANOTECHNOLOGY IN FOOD

Mr. Shishir Tiwari, Dept. of Biotechnology

Dr. C.V. Raman University, Bilaspur

Abstract

In the food industry and processing, nanotechnology has the ability to be used as fresh instruments for pathogen identification, disease therapy delivery systems, food packaging, and distribution of bioactive compounds to target locations. Using nanotechnology in food systems will provide fresh techniques for improving food products ' security and dietary value. This paper will review the present developments in food science and technology nanotechnology applications. It also discusses fresh present food laws in the field of nanofood risk analysis and novel articles in the food industry.

Key words: Nanotechnology, food industry, analysis.

Introduction

When nanostructured, most materials have distinct characteristics and these characteristics rely on the place intended for each atom or molecule[1]. The resulting materials and structures can be intended to display new and considerably enhanced optical, chemical, biological, and electrical characteristics such as nanotubes, nanomaterials, nanowire, etc. The potential of nanotechnology[2] is to revolutionize farming and food systems. The amount of nanoscale foods can influence the characteristics of safety, effectiveness, bioavailability and dietary value as well as the molecular sequencing of new products and ingredients.

Nanotechnology in Food Processing

The use of nanomaterials offers superior enzyme support systems[3] (enhancing activity, shelf life and cost-effectiveness) owing to their assistance in dispersion through food matrices[4] and their big surface-to-volume ratios compared to traditional macroscale support materials. For instance, nano-silicon dioxide particles efficiently hydrolyzed olive oil with altered stability, adaptability and reusability.

Nano sensors

Biosensors can be used in packaged products to detect gases, pathogens, or toxins. It has been revealed that nano biosensors are used to detect pathogens[5] in processing crops or to alert customers, processes and retailers about food safety status.

Assessing risk of Nano particles

A report on Magic Nano, regarding risk assessment was released on a spray-on ceramic sealant for repelling dirt. The risk assessment of nanoparticles and nanostructures has shown that the potential paths of human injury to nanoparticles are skin, lungs, and gastrointestinal tract. Nanoparticles can be absorbed from the intestine and enter the circulatory system[6], [7] by adding nanostructured materials to food, water and medications, but there is not much study centered on this prospective entry path.

Conclusion

Nanotechnology may create equipment to quickly identify nutrient deficiencies (such as AFM) and pathogens in food (including nano sensors). Many nations have created numerous nanotechnology applications in food systems and processing, some of which include nano-based food additives, nano sensors, nano capsules, nano-based intelligent distribution systems, nano packaging, and health care and medicine. The impacts of using nanotechnology in their lives were relatively recognized and adopted by individuals nowadays. Nanotechnology's potential makes it appropriate for developing nations because these nations could possibly engage some of the latest nanomaterials and markets for production.

References

[1]   U. O. S. Seker and H. V. Demir, "Material binding peptides for nanotechnology," *Molecules*. 2011.

[2]   S. E. Lyshevski, "Nanotechnology," in *The CRC Handbook of Mechanical Engineering, Second Edition*, 2004.

[3]   J. Zdarta, A. S. Meyer, T. Jesionowski, and M. Pinelo, "A general overview of support materials for enzyme immobilization: Characteristics, properties, practical utility," *Catalysts*. 2018.

[4]   L. Ramos, "Matrix Solid Phase Dispersion," *Compr. Anal. Chem.*, 2017.

[5]   M. El Bour, "Pathogens," in *Encyclopedia of Earth Sciences Series*, 2016.

[6]   S. K. Sahoo, S. Parveen, and J. J. Panda, "The present and future of nanotechnology in human health care," *Nanomedicine Nanotechnology, Biol. Med.*, 2007.

[7]   D. P. Nikolelis and G. P. Nikoleli, *Nanotechnology and biosensors*. 2018.