OPEN ACCESS Freely available online

ISSN: 2157-7110
Journal of Food Processing & Technology

Commentary

Applications of Nanotechnology in Food Sciences

Jun Huang*

Department of Food Technology, Illinois University, Chicago, USA

DESCRIPTION

Food analysis is used to detect numerous analytes in several food risks and agricultural chemicals. The current methods for detecting risks and testing food quality necessitate expensive sensors, a large workforce, and time-consuming procedures. It also shed some light on nano biosensors features, classification, and future possibilities. In agricultural and food science, nanotechnology is an intriguing and fast developing field. Nano scale materials are increasingly being used in sensing and detection applications, enabling alternatives to traditional methods for identifying chemical and biological pollutants in foods, beverages, and other items. Nanotechnology has the potential to revolutionize the agricultural, feed, and food industries (read on for more information). Nanotechnology has the potential to alter the agricultural, feed, and food industries. Original product packaging containing antimicrobial nanoparticles, as well as nano-encapsulated agrochemicals and nutrients, are already available in the market. Many nano-enabled items are now being researched and developed, with the possibility of commercialization in the near future. For market sanctions, applicants must demonstrate that such innovative items can be used safely without causing undue safety hazards to consumers or the environment, just like any other structured product.

Nanotechnology is engaged with nanoparticles with a dimension of 1 nm to 100 nm. Inorganic (metallic nanoparticles NPs), organic (natural substance NPs), and integrated nanomaterial's have all been tested in the food business (*i.e.* clay). Due to its antibacterial properties, silver NP is the most commercially produced and used metal NP, whereas gold NP is being researched as a sensor/detector. Titanium dioxide nanoparticles have also been investigated as a disinfectant, a food ingredient (white color pigment), and a flavor enhancer. Natural compounds NPs are commonly used as a delivery system in the food business, but they can also be used as ingredients or supplements. Pathogenic infection and poor nutrition have been linked to microbial contamination in weaning foods. As a consequence, one of the most important topics in the production, processing, transportation, and storage of food is dealing with bacterial degradation. Novel nano antimicrobials have showed promise in preventing food deterioration and thereby prolonging food shelf life. Antimicrobial properties of a variety of metal and metal oxide nanoparticles have long been suspected. Due to their inherent physicochemical features, they produce an excessive amount of Reactive Oxygen Species (ROS), which causes oxidative stress and eventual cell damage. Furthermore, metal ions released from outside the cell, at the cell surface, or within the cell might change the structure or function of the cell. Metal/metal oxide-based nano composites have thus been used in the packaging and coating of food.

Moreover, the most frequent method of controlling browning of fresh-cut fruits is to apply antioxidant treatments in conjunction with edible coating. Browning of fresh-cut fruits is a common occurrence caused by the conversion of phenolic components into dark colored pigments in the presence of oxygen during storage and marketing. However, only a few nano materials have been used directly as anti-browning agents. For increasing the shelf-life features of "Fuji" apples as a fresh-cut product, nano-ZnO-coated active packaging has indeed been found to be a viable alternative to current technologies.

Due to its unique features and molecular structure, zein, a prolamin and the primary protein present in corn, has long been a valuable commodity in science and business. New zein uses in food and biodegradable plastics are likely to emerge as a result of novel techniques. Zein can create a tubular structural meshwork that is inert and resistant to germs after being treated with solvents. Zein nanoparticles have been created and tested as flavor component transporters, for nano encapsulation of nutritional supplements, and to improve the strength of plastic and bioactive food packaging. Controlling the homogeneity and organization of zein films at the nano scale is crucial for the mechanical and tensile properties of the material.

In conclusion, nanotechnology's progress and application in food science and the food industry, as well as its success in other sectors, should be embraced with prudence but not fear. Although the destiny and possible toxicity of nanoparticles are

Correspondence to: Jun Huang, Department of Food Technology, Illinois University, Chicago, USA, E-mail: junhuang@iit.edu

Received: 02-Mar-2022, Manuscript No. JFPT-22-16293; **Editor assigned:** 04-Mar-2022, PreQC No. JFPT-22-16293 (PQ); **Reviewed:** 18-Mar-2022, QC No JFPT-22-16293; **Revised:** 25-Mar-2022, Manuscript No. JFPT-22-16293 (R); **Published:** 02-Apr-2022. DOI: 10.35248/2157-7110.22.13.920

Citation: Huang J (2022) Applications of Nanotechnology in Food Sciences. J Food Process Technol. 13:920.

not fully known at this time, it is clear that innovative nanotechnology has made substantial gains in the food business. Nanotechnology can help identify pesticides, infections, and poisons, which are useful in the food quality tracking tracing monitoring chain. Furthermore, as part of an active and intelligent packaging system, nanotechnology has the potential to change our future food packaging materials.