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FUTURE ASPECT OF NANOPRODUCT IN FOOD SAFETY AND PACKAGING

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Nanotechnology is innovative frontiers of this century and food nanotechnology has potential to revolutionize the food industry. The purposes of nanosciences to the agriculture and food sector are reasonably current assessed with their exploitation in drug delivery and pharmaceuticals. Various researchers have acknowledged well the potential of nanotechnology to lead all the food industries in the 21st century. Even though valuable functions of nanotechnology to foods are still limited, numerous fundamental concepts found in nanoscale have been recognized well. Several crucial challenges as well as determining of important composites, producing most approving intake levels, increasing adequate food delivering matrix and product formulation including the safety of the products need to be addressed. This review proposed the information regarding to cover some of the developments in nanotechnology and their applicability to food and nutraceuticals systems. It shows a number of nanoscale-sized structures that are uniquely relevant to the food industry, the several food industrialized methods that could benefit from nanotechnology and nanotechnology's applicability to the formulation and storage of food, together with recognizing the outstanding challenges.

Keywords: Nanoparticles, food product, Nanoproduct, Food Safety

INTRODUCTION

Nanotechnology is a multidisciplinary field that focuses on the understanding and development of materials based on nanoscale structures. Its applications are not limited and can be applied to diverse areas like food industries, textiles and pharmaceutical [Jochen, W., et al., 2013]. The information gained from these areas could be adapted for the use of food and agriculture products, such as for applications in food safety, in environmental protection, and in delivery of nutrients [Ulijn, R.V., 2007]. In present times, "Nanotechnology" is an essentially modern scientific field that is constantly developing as a broad area of research with respect to dairy and food processing, packaging safe guarding and advancement of functional foods. Food and dairy producer, agricultural manufacturers and consumers could achieve a further competitive position through nanotechnology [Dowling, A et al., 2004]. Application of Nanotechnology in Food Processing Nanotechnology has prospective applications in all aspects food processing, food packaging and food monitoring. Production of foods accomplished of modifying their colour, flavour or nutritional properties according to a person's nutritional requirements, allergies, or taste preferences, manufacture of stronger flavourings, colouring and nutritional additives and lowering costs of components [Daniells, S., 2007]. Extracting nutrition from raw resources is a significant ingredient of the food industry. Through fast distribution technology, conventional systems for processing food are being substitute by new techniques. Certainly, nanotechnology will play a major responsibility in this development. In food processing, such techniques may develop food processing yields and reduce spoilage of nutrition [Dingman, J., and Rehs, D., 2008]. Nanoparticles are included to numerous foods to get better flow properties, colour and stability during processing or to enhance shelf life [Ashwood, P., et al., 2007]. Safety Issues and Future Trends of Nanotechnology in Food Industries Recently, food packaging must been made with static materials, but active and smart materials have also been marketed. Antibacterials, Enzymes, and absorbent substances not only increase shelf life and get better storage conditions but also make food distribution much easier [Renton, A., 2006]

According to our information about the safety of used nanomaterials in food and nutrition industries is short. In the field of Research and development, active and smart packaging materials are very vigorous and develop in relation among the search for environment affable packaging solutions [Zhang, C., et al., 2006]. Nanotechnology will be involved in the developed of controlled release of active agents and for targeted indicators. Innovative non migratory materials for new functions for instance in package food processing are also a capable field of development [Dainelli, D et al., 2008]. In a common

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way, three main support for related to safety issues with active and intelligent or smart packing;

(a) Labeling, with the aim to avoid waste and error by the downstream users or consumers, e.g. to keep away from sachets from being consumed;

(b) Movement of active and intelligent substances should be mistrustfully judged with all breakdown products, similar to function of their toxicity. The implementation of releasing active packaging during food legislation shall be directly related to movement phenomena. Evaluating migration implies to develop offered migration tests over and above mass transfer modeling tools because those existing, or recommended for conventional plastics, are not modified to active and intelligent systems;

(c) usefulness of the packaging: lastly in several specific cases, the capability of the packaging to perform the preserved function can increase safety issues like for any food protection technology, e.g. delivering a additive or absorbing oxygen in a proper way for preventing microbial growth not including antimicrobial resistance or pathogen more than growth, or giving consistent information on pathogenic bacteria occurrence for direct indicators.

A supple legislative structure and suitable testing methods are required for supporting such a highly novel field, i.e. to continue not only with the market as it is, but also as it will be [Dainelli, D et al., 2008]. That various nanomaterials enter into the human body. According to a report, the British Royal Society comments that we may face a nano-toxicity disaster in the future [Taghavi, S.M et al., 2013]. This report calls for avoiding nanotechnology in products until there is an inclusive understanding of the environmental and health risks of revelation to nanoparticles [Takeuchi, M.T et al., 2014].

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