

## **Application of Nanotechnology in the Food Industry**

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**Introduction.** The article analyzes the main fields of application of nanotechnology in food industry, in particular accentuating on its possible usages in the sphere of packaging technologies.

**Materials and methods.** As the objectives include examining the possible applications of nanotechnology in packaging sphere, the research is conducted on the basis of systematization and analysis of various scientific works, related to the food processing industry, as well as the employment of the descriptive method for the more precise description of the data and characteristics of the issue under consideration.

**Results and Discussion.** A number of new technologies applied in the sphere of food packaging poses by far the most promising field for the future application of nanotechnology in the near future. Companies are already producing packaging materials based on nanotechnology that prolongs shelf life of food and beverages as well as increases its safety.

Many companies and universities work on developing the revolutionary type of packaging that would offer a variety of new possibilities like warning about unfit packaged food in response to changing environmental conditions or restoring the integrity of the package in cases of its minor damages. Apart from that, one of the most promising innovations in “smart” packaging is the use of nanotechnology in order to develop an antimicrobial packaging. Scientists from major companies, including Kraft and Bayer, and many universities are working on developing a number of intelligent packaging materials that would absorb oxygen, which serves as food’s pathogens, and would warn consumers about spoiled food. These smart packages would help to detect pathogens such as Salmonella and E.coli. In this respect, it should be remarked that scientists in the Netherlands are working on smart packaging that would not only enable understanding when the food begins to spoil, but also replacing the preservatives aimed at extending the shelf life of packaged products.

Apart from that, the research on nanocrystals is conducted that presupposes being embedded into plates in order to create a molecular barrier which is aimed at preventing the release of oxygen. Therefore, this technology allows keeping the products fresh longer. For instance, the application of this technology by several companies had already enabled keeping beer fresh for 6 months. Yet, the company’s developers are already working on the bottle in order to extend shelf life up to 18 months. Several large beer products, including the ones in South Korea, namely Hite Brewery and Brewery Miller, are already using this technology.

**Conclusion.** The use of nanotechnology in packaging sphere has led to a revolution in this sector. New types of packaging, including active and “intelligent” packaging, are already emerging. The share of packaging materials, in general, accounts for more than half of the total share of nanotechnology in food.