

Sustainability of Packed Foods at Fluctuated Conditions

Rubella Mitchell*

Department of Food and Nutrition, Chandigarh University, Chandigarh, India

Commentary

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***For Correspondence:** Rubella Mitchell, Department of Food and Nutrition, Chandigarh University, Chandigarh, India

E-mail: mitchell.rubella@gmail.com

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ABOUT THE STUDY

Food packaging is a type of packaging system that is specifically designed for food. It is one of the most important aspects of the food industry processes because it protects food from chemical, biological, and physical alterations. The primary goal of food packaging is to provide a cost-effective means of protecting and delivering food goods while meeting the needs and expectations of both consumers and industries. Furthermore, current trends such as sustainability, environmental impact reduction, and shelf-life extension have gradually risen to the top of the priority list when designing a packaging system.

Trends in food packaging

1. Numerous industry association reports agree that the use of smart indicators will increase. There are a variety of indicators available, each with its own set of advantages for food producers, consumers, and retailers.

2. Temperature recorders are used to monitor products shipped in a cold chain and to aid in cold chain validation. Food shipments' temperatures are measured and recorded using digital temperature data loggers. Temperatures are sometimes displayed on the indicator, and other outputs (lights, etc.) These aids in determining whether or not products have been subjected to temperature abuse and can aid in determining the remaining shelf life.
3. The time and temperature experienced by the indicator and adjacent foods are combined in time temperature indicators. Some employ chemical reactions that result in colour change, while others employ dye migration through filter media. The indicator can help predict probable food degradation to the extent that these physical changes in the indicator match the degradation rate of the food.
4. Radio frequency identification is used on food packages to control the supply chain. It has demonstrated a significant benefit in providing food producers and retailers with complete real-time visibility of their supply chain.
5. Because of potential interactions with food, most plastic packaging is non-biodegradable. Furthermore, biodegradable polymers frequently require special composting conditions to degrade properly. Biodegradation is not promoted in normal sealed landfill conditions. Biodegradable plastics are biodegradable films and coatings made from organic and microbial polymers. Some of the packaging materials are edible. Pharmaceuticals, for example, are sometimes packaged in capsules made of gelatin, starch, potato, or other materials. Newer bioplastics, films, and products are in the works.
6. Modified Atmosphere Packaging (MAP) and other variations of this technology have grown in popularity and application in the food packaging industry over the last few decades. The use of a specific gas mixture within the packaging headspace has proven to be ideal for slowing down the metabolic process of food products, thereby extending the shelf-life of meat, fish, fruits, and vegetables.
7. Because of its versatility, processability, and efficacy, the design of multi-layer packaging systems has been recognized as state-of-the-art in food packaging application. Each layer can be made of a variety of materials and provides critical functionality to the overall structure, such as improved mechanical properties, chemical stability, barrier properties, and anti-microbial properties. However, the use of such a complex structure reduces its recyclability significantly.
8. Recently, the application of protective coatings to commercially available packaging materials (such as PET, PP, PLA cardboard, or biopolymer) has been proposed as a potential solution to the growing environmental impact caused by both food and packaging waste.
9. For decades, barcodes have been used in the packaging of many products. Auto coding 2D barcodes are increasingly being used on food packaging to ensure that products are correctly packaged and date coded.
10. The surface energy of the container's inner walls influences a package's ability to fully empty or dispense a viscous food. The use of super hydrophobic surfaces is beneficial, but it can be enhanced by the use of new lubricant-impregnated surfaces.