The Role of Packaging Technology in The Food Product

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Abstract. Food packaging is a life necessity that has evolved and is still evolving to suit the requirements of the consumer and modern society. Commercially manufactured food cannot be processed without packaging and packaging materials, as the World Packaging Organization estimates and distributes that more than 25% of the food is lost due to poor packaging, which in turn places the burden on packaging to reduce the great loss of food through the continuous development of packaging materials. And methods in proportion to the food product. The use of renewable edible agricultural materials which major role in the food industry has increased because the development in technologies to improve the properties of edible polymers is the main issue in future research. Most of the studies today are focused on extending the shelf life of food in the applications of biological or biological membranes and covering food with the most important advantages of edible films that have aroused consumer interest, which are made of natural edible materials, non-toxic and non-polluting to the environment compared to plastic films and increase The nutritional value when present as a film over the food and controlling the water content in the food wrapped in it, whether in not absorbing or losing moisture, as well as protecting it from the absorption or loss of flavors and does not require expensive techniques and thus reduce the production cost and the cost of treating environmental pollution implicitly without. The presence of residues for packaging when used, in light of the wide range of food products such as meat (fish, poultry, beef) and other foods that are very sensitive to fat oxidation and microbial contamination, these products are considered to have edible, antioxidant and microbial membranes very important in their protection targeting innovative trends. In the field of food packaging research in introducing improvements in food quality and safety and increasing the shelf life or period validity as well as quality control based on equipment and international quality standards, where strategies in packaging represent the development of multi-functional packaging materials based on the use of renewable biodegradable materials and natural additives as well as their traditional packaging functions (containment, protection, marketing, provision, consumer.

1. Introduction

Edible wrappers and coatings act as a barrier to protect foods from spoilage or contamination, to retain vitamins and other nutrients, and to preserve the nutritional value of foods [1, 2]. (Such as breakfast cereals and freeze-dried foods) by reducing losses due to mechanical spoilage, reducing moisture loss, respiration and discoloration in fresh fruits and vegetables to extend their shelf life, as well as seasoning adhesives in low-fat snack foods (such as potato chips), preventing oxidation and migration of moisture Or odors and loss of color in frozen foods. Food packaging plays an important role in protecting food products during their storage and transportation from the factory to the consumer, and it is an integral part of food processing. The primary function of food packaging is to protect food products from environmental and industrial factors such as microbial and chemical pollution, oxygen, water vapor and light, and other functions are to provide consumers with nutritional information and its components with adequate education and to ensure the product's suitability to the customer [3] The development of food film technology can play an effective role in the manufacture of the product, and to preserve the quality of the food, these developments have been recorded as effective packaging [4].
The effectiveness of the coating is determined by its mechanical and barrier properties, which depend on its composition, microstructure, and the properties of the substrate. Edible anti-microbial films and coatings are used to improve the shelf life of foods without compromising consumer acceptance. Edible films and coatings are not designed to replace conventional packaging and can be used in minimally processed foods to prevent surface contamination. The flavor can also be incorporated into edible films and is released when the film melts on contact with saliva in the mouth [5][6]. Not all gums are used in the manufacture of edible films, as some gums have a distinct bitter taste, which is a serious defect [7]. Carrageenan shows great potential for forming membranes because it is composed of water-soluble polymers. It has many uses in fresh and frozen meat, poultry, fish and oily foods [8].

Some of these films may play a major role in preventing the migration of fats from food and into it when frying, facilitating the process of adding substances to the membrane solution, such as antioxidants, microbial contamination, spices, colorings, food supplements and flavoring materials, preventing moisture loss and preserving it and preventing the loss of flavoring materials. It plays an important role in reducing or preventing respiration due to its good mechanical properties and reservoir properties, which leads to improvement of the properties of stored fruits and vegetables [9]. The main active packaging systems include oxygen removers, carbon dioxide removers, moisture absorbers or controllers, ethylene removal, odor absorption and loss control, active enzymatic systems and antimicrobial systems [10].

Edible films and coatings are made from many natural polymeric sources such as starch, gelatin, whey proteins, casein, etc. to replace the plastic films to reduce environmental pollution due to the accumulation of packaging materials such as wrapping fruits and vegetables with wax and in fast food packaging. It is necessary to take into account the conditions in which these membranes are used because they are sensitive to temperature and relative humidity. And that many natural polymeric resources can be used to make edible films, but that depends on the cost of manufacturing these films [11].

The packaging system is an essential element in enabling the product to compete in global markets, considering that proper packaging is the first interface for the commodity that the consumer receives at first sight, and this does not mean that the packaging is only a formality, but rather it represents an important share of the commodity specifications ... This is in addition to the fact that the packaging industry A good fit requires extensive knowledge of the nature of the raw materials involved in their manufacture, their characteristics, the extent of their stability in front of influences such as light and heat, their tolerance for transport and circulation, and the extent of consumer acceptance of the package [11], whether in the local market to face competition with foreign products or the external consumer in joining global competition.

2. Packaging Systems

It is a set of successive stages through which the raw material, supplies, and commodities and their components go through from different production sources until they reach the consumer or user of this package through the handling and transportation operations [12]. And the importance of the packaging is as follows:
First: It is protected and contained
Where the packaging contains and protects the food product from what it may be exposed to from risks or damages - in addition to the necessity of its suitability to the packed food to ensure the continuity of preserving the quality of the product and even its arrival to the consumer during the storage period.
Second: Advertising
The packaging is a clear advertisement for the product, as it is the first thing that grabs the consumer's attention from the commodity and raises his desire to buy.
Third: the competition
Package can contribute to the competitiveness of the commodity by:
Economies of package cost in terms of total commodity cost.
- The quality of the packaging, its aesthetic appearance, suitability for use and environmental safety.
- Expanding the introduction of advanced technology, whether in production, reuse or recycling of packaging waste.
- Development of specifications for packaging and packaging materials in accordance with international standards.
- Development of inspection and testing laboratories, whether for packaging materials or for the final package.

Development and Environment

Where the use of modern technology in the production of appropriate packaging contributes to the development of sales, whether at the local level or export.
Packaging materials play an important role in affecting the environment because of the waste they produce, most of them from plastic - paper - aluminum - tin, and their disposal is an important and necessary matter required by the requirements of a clean and safe environment [13]. This led to adding a new dimension to the packaging system, which is environmentally friendly packaging. The environmental dimensions in the packaging system can be reviewed and how to solve them by:
1. Choosing environmentally friendly materials and manufacturing methods.
2. Development of waste disposal and reuse or recycling methods.
3. Focus and attention on efforts made to protect and preserve the environment related to packaging.
4. Raising awareness, whether for the producer or manufacturer of the foodstuff or the consumer, of ways to deal with packaging waste.

And dealing with solid waste for packing materials, there are three directions to reduce the accumulation of this waste, known as 3 Rs
Reduce by working to reduce the raw materials used in the manufacture of packaging by reducing its thickness by producing alternative materials with greater durability and resistance to external influences.
Recycling it by forming it again after mixing it with a percentage of the original packaging material that has not been previously manufactured - this trend achieves a clean environment that works at the same time to provide cheap raw material.

3. Packing Materials

Paper - cardboard - glass - tinplate - aluminum - wood - boxes - trays - HDPE plastic - LDPE - polystyrene polypropylene - a package that contains more than one type of tetraspace package consisting of (plastic) Aluminum-paper [14].
The standard is considered an important and influential element in packaging materials, including the basic requirements and quality factors it contains, taking into account the quality of the packed food, while preserving the quality of the food until it reaches the consumer while protecting the environment.
And because of the importance of the packaging system for the arrival of the product, regardless of food or chemical quality. There are packaging committees used in manufacturing, such as plastic and glass raw materials, and the special requirements they require [15], and others in the textile industries sector, and the engineering industries sector, and the food industries sector develops standard specifications for packages used in packing foodstuffs.
The standard is considered to have an important role in the packaging system for several considerations:
1. The standard is prepared in light of the latest international references and legislations issued in this field.
2. The standard is prepared by a working group that includes in its membership the research centers - the university - the package producers - the users of the package - the supervisory authorities - the analytical
authorities - so the standard is considered the product of coordination and thinking of the concerned authorities.

3. The authority shall include the safety and health requirements that must be met in the package.

4. In addition to the standard specifications for packaging materials, the authority issues specifications for methods of examination and testing to achieve the provisions of the standard.

4. Conclusion

food packaging has an important role in protecting food products during their storage and transport from the factory to the consumer, and it is an integral part of food processing. The primary function of food packaging is to protect food products from environmental and industrial factors such as microbial and chemical pollution, oxygen, water vapor and light, and other functions are to provide consumers with nutritional information and its components with adequate education and to ensure the product's suitability to the customer [13]. The development of food film technology can play an effective role in the manufacture of the product, and in preserving the quality of the food. These developments are recorded as effective packaging.

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