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REVIEW ARTICLE

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Recent Technological Advancements in Food Packaging: A Review

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ABSTRACT

The principal roles of food packaging are to protect food products from outside influences and damage, to contain the food, and to provide consumers with ingredient and nutritional information (Coles et al. 2003). Traceability, convenience, and tamper indication are secondary functions of increasing importance. The goal of food packaging is to contain food in a cost-effective way that satisfies industry requirements and consumer desires, maintains food safety, and minimizes environmental impact.

Key words: Food packaging, Food safety, Tamper indication, Environmental impact and Preservation.

INTRODUCTION

Food packaging can retard product deterioration, retain the beneficial effects of processing, extend shelf-life, and maintain or increase the quality and safety of food. In doing so, packaging provides

protection from 3 major classes of external influences: chemical, biological, and physical. Chemical protection minimizes compositional changes triggered by environmental influences such as exposure to gases (typically oxygen), moisture (gain

or loss), or light (visible, IR or UV). Many different packaging materials can provide a chemical barrier. Glass and metals provide a nearly absolute barrier to chemical and other environmental agents, but few packages are purely glass or metal since closure devices are added to facilitate both filling and emptying. Closure devices may contain materials that allow minimal levels of permeability. For example, plastic caps have some permeability to gases and vapors, as do the gasket materials used in caps to facilitate closure and in metal can lids to allow sealing after filling. Plastic packaging offers a large range of barrier properties but is generally more permeable than glass or metal.

Technological advances in food packaging

The advancements in food technology and packaging technology have made it possible to extend the shelf-life of these products. Before deciding which packaging material is to be used, it is necessary to know the packaging requirements of the product i.e. what hazards will cause product deterioration and the conditions to which the packaged product will be subjected throughout its shelf-life. Some important packaging considerations, which influence the selection criteria for choosing packaging materials, are highlighted.

Influences on food quality parameters due to use of various types of packaging materials

Polymeric based packaging materials have attracted attention as choice of packaging because of their versatility and capability to offer a wide range of properties. Additionally, polymeric films are easily processed and can be conformed into a range of shapes and sizes. Polymer films are permeable to oxygen and water vapor at a

rate characteristic of the polymer (Mullan and McDowell, 2003). Thus, polymers that have inherent low gas permeability (i.e. high barrier polymers) like ethylene vinyl alcohol (EVOH), Nylon, polyethylene terephthalate (PET), etc., are considered as suitable candidates as packaging materials. In most cases, the functionality and properties of gas barrier polymers are further enhanced by combining different polymer layers to form multilayer structures where each layer contributes to a specific function. For example, hydrophilic polymers like EVOH and Nylon are protected from contact with moisture during thermal processing by polyolefin layers like polypropylene (PP) and polyethylene (PE) (Mokwena *et al.*, 2009).

Marsh and Bugusu (2007) reported that ideal multilayered packaging materials should impart protection from 3 major classes of external influences: chemical, biological, and physical. Sharma *et al.* (2013) carried out a study to evaluate the effect of green plantain pulp (GPP) and hydrated soy chunks (HSC) as an extender on the quality and acceptability of restructured chicken meat block (RCMB). The moisture, ash percentage and shear force value increased with the increasing levels of both GPP and HSC, but protein and fat percent decreased with increasing levels in both the cases which is concurrent to the finding in our present study. In the present study, multilayer packaging of extruded fishery products retarded product deterioration, retained the beneficial effects of processing by extending the shelf-life and maintaining and increasing the quality and safety of the processed fishery product.

CONCLUSION

There is a broad area for exploration on the performance of standard and ideal

sustainable packaging materials and methods with or without gas flushing in food science. This can be evaluated for processed food products along with its efficiency in shelf-life extension.

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