AgriCos e-Newsletter
ISSN: 2582-7049
Volume: 02 Issue: 07 July 2021 Article No: 05

Edible Food Coating- Solution to Overcome Pollution

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SUMMARY

In this article content all about edible films and coating that are used as an edible surface on different types of food material like chocolate's, tablets, sweets, capsules etc. They are generally made from the polysaccharides, lipids, proteins and other renewable sources. The edible films or coatings are wrap on food or placed in food and food pack on the edible pouches. We will directly eat them with products or they are biodegradable or recycling material. As compare to all edible films it is concluded that protein-based films have imposing gas barrier properties and would be an appropriate food packaging material for preventing the expansion of aerobic microbial growth and lipid oxidation in foods.

INTRODUCTION

"An edible film is known as a thin layer of edible material applied on food surface as a coating or placed on or between food components" (McHugh, 2000). Different types of recent research in edible films and coatings with in the food and packaging industries have been increasing the demand of consumer for safe, high-quality, convenient foods with long shelf lives and also ecological consciousness of limited natural resources and therefore the environmental impact of packaging waste. Edible packaging materials are considered as attractive alternatives for some applications due to their unique properties, including the ability to protect or foods with their barrier and mechanical properties, enhance organoleptic characteristics, control-release active ingredients, and control mass transfer between components of heterogeneous foods (Erkman and Brazi, 2018).

Classification of edible films (Bourtoom, 2008).

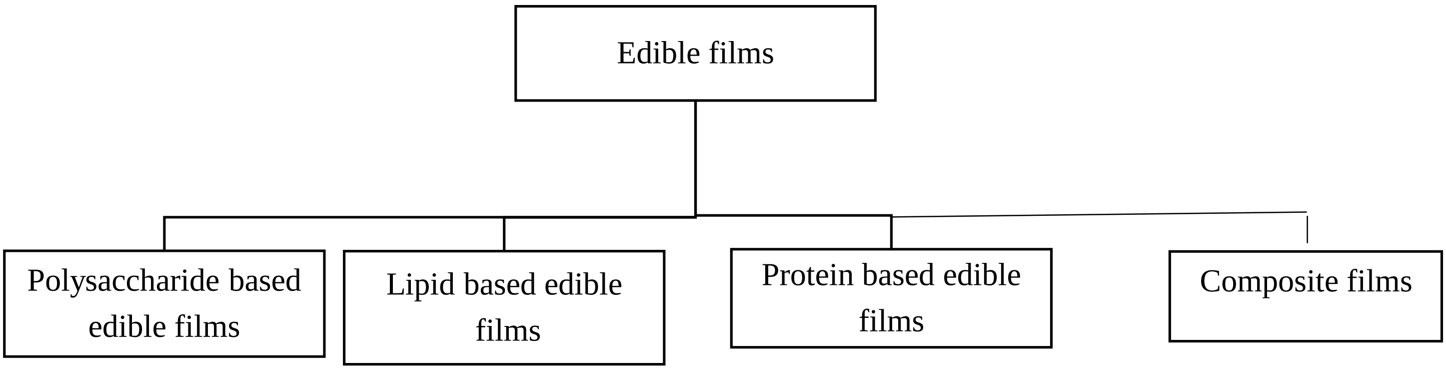

Fig 1. Classification of edible films

Materials used for the making of edible films or edible coatings are classified into three categories: hydrocolloids (such as proteins, polysaccharides, and alginate), lipids (such as fatty acids, acylglycerol, waxes) and composites (Donhowe and Fennema, 1993). Applications of those materials on food products are investigated since they might be an alternate to synthetic polymer films reducing the negative environmental impact and disposals costs (Rubilar *et al.*, 2015). Among their several benefits, nontoxicity, biodegradability, wide availability and biocompatibility are included (El Miri *et al.*, 2015).

A. Polysaccharides based edible films:

Polysaccharides and its derivatives that have been used as edible films or coating material include alginate, pectin, gum, starch, chitin and chitosan, cellulose derivatives. Changes within the molecular characteristics of polysaccharides results in the variation in their film forming ability and performance after the formation of coating (Galgano et al., 2015). The hydrophilic polysaccharide components are found to possess good mechanical properties but the edible films and coatings made from these materials have greater permeability for water vapour and gasses (Bourtoom, 2008).

B. Lipid based edible films:

Lipid compounds utilized as protective coating they should be contain of acetylated monoglycerides, natural wax, and surfactants. The most efficient lipid substances are paraffin wax and beeswax. The essential function of a lipid coating is to block transport of moisture due to their relative low polarity. In contrast, the hydrophobic characteristic of lipid forms thicker and more friable films. Consequently, they need to be related to film forming agents like proteins or cellulose derivatives (Debeaufort et al., 1993).

C. Protein based edible films:

The film-forming proteins are obtained from animals (e.g., casein, whey protein concentrate and isolate, collagen, gelatin, and egg albumin) or plants (e.g., corn, soybean, wheat, cottonseed, peanut, and rice). (Cordeiro de Azeredo, 2012). Protein-based films and coatings are made up of solutions comprised of three important components: protein, plasticizer and solvent (panyam and kilara, 1996). Protein-based films are most attractive because they provide nutritional value (Galus & Kadzińska, 2016).

D. Composite films:

Edible films and coatings could also be heterogeneous in nature, consisting of a mix of polysaccharides, protein, and/or lipids. This approach enables to use the distinct functional characteristics of each class of film former (Kester and Fennema, 1986). The combination between polymers to make films might be from proteins and carbohydrates, proteins and lipids, carbohydrates and lipids or synthetic polymers and natural polymers. The main objective of producing composite films is to enhance the permeability or mechanical properties.

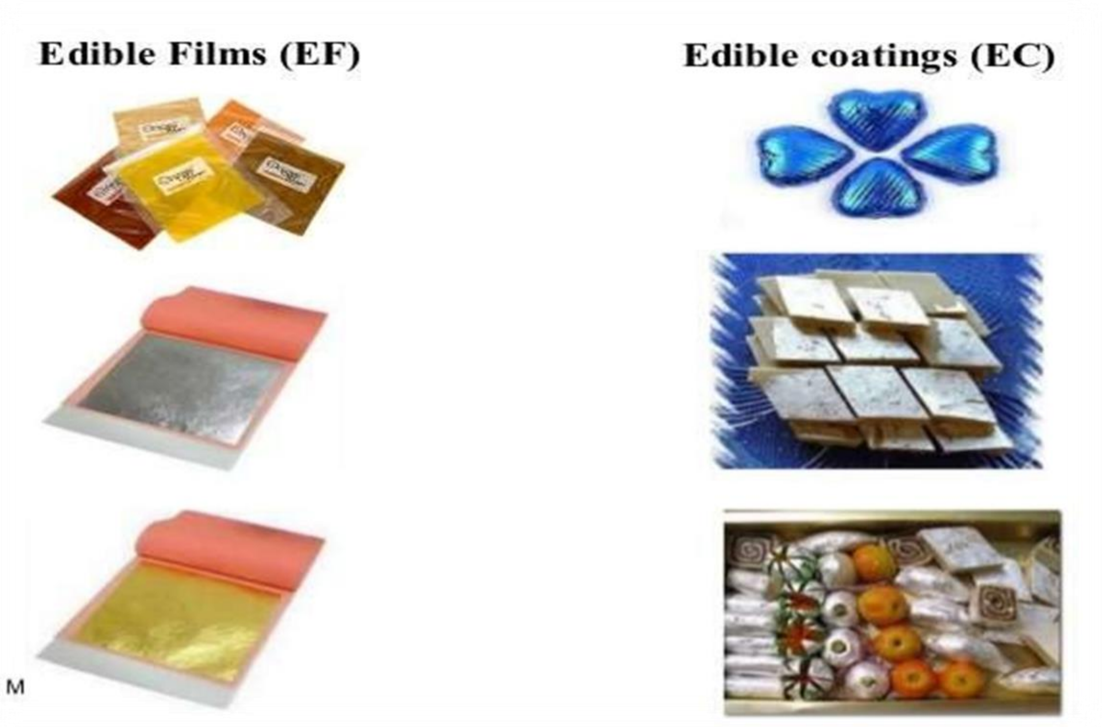

Fig 2. Edible films and Edible coatings

CONCLUSION

The edible films or coating use as edible packaging material to food over synthetic films. The water vapour resistance and mechanical strengths both are poor in edible films as compare to synthetic films and this limits their use in food packaging. Their properties could be improved by chemical and enzymatic methods, by combining them with hydrophobic material or some synthetic polymers or by employing a physical method. As compare to all edible film's protein-based films have imposing gas barrier properties and would be an appropriate food packaging material for preventing the expansion of aerobic microbial growth and lipid oxidation in foods.

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