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Edible Coating: A Saviour of Fruits and Vegetables

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INTRODUCTION

Low shelf life is the crucial problem in fruits, which affects the consumer preference and marketability. The process of transpiration starts after harvesting of fruits from plant, which leads to the loss of quality along with shrivelling, and ultimately shortens the life of the fruit. Problems like flaccidity, wilting and decay etc. also occur during postharvest management of fruits and vegetables that ultimately influence marketability of the same including consumer preference. The effective method to solve this problem is edible coating. The edible coating is a thin layer that can be eaten and ward off damage caused during the storage period. These can be applied to the surface of food, thereby increasing the safety, quality and quantity of nutrients. Examples given below as:

Fruits: Edible coated fruits are Orange, Apple, Grapefruit, Cherry, Papaya, Guava Lemon, Strawberry, Mango, Peach etc.

Vegetables: Tomato. Cucumber, Capsicum, Cantaloupe and minimally processed Carrot, fresh-cut Potato, fresh-cut Cabbage, fresh-cut Tomato slices, fresh-cut Onion, Lettuce.

TECHNOLOGIES BEHIND:

- Since these coatings have the biodegradable ability that provides a barrier against moisture, gases and solute movement so they are usually made from biodegradable materials such as Lipid, Protein- or Polysaccharide-based materials.
- The packaging material is either used via a film or using coating. The latter is usually in liquid form whiles the former usually forming a thin layer around the food product.

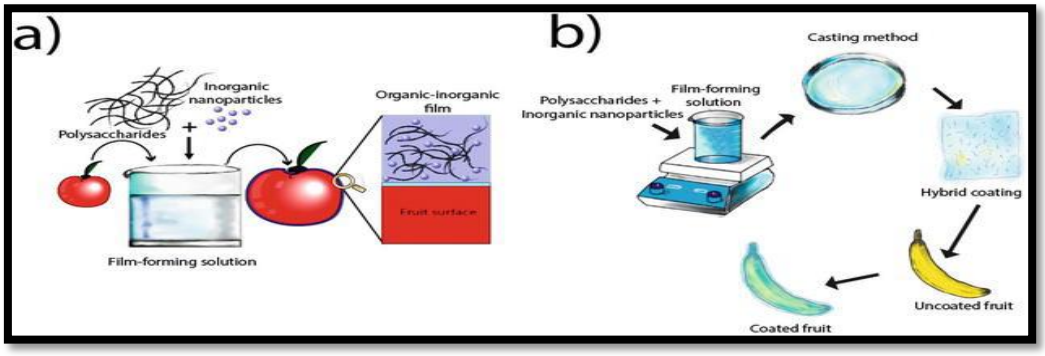
CLASSIFICATION OF COATINGS:

Three main groups; Protein-based edible coatings, Polysaccharide-based coatings and lipid-based coatings.

1) Protein based:

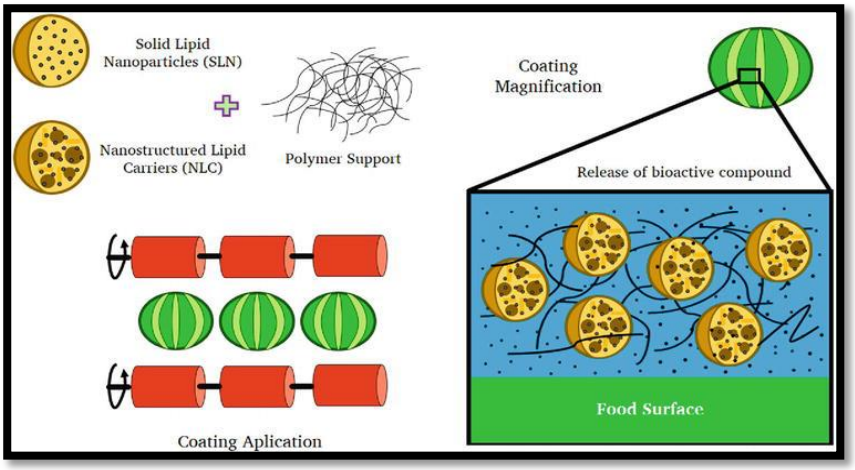
- Occur in the form of globular proteins or fibrous proteins.
- Fibrous proteins are insoluble in water but soluble in aqueous solutions of salt, - or acids and perform different activities in living systems.
- Includes the use of casein, gluten and soy protein serve as good oxygen blockers and thus help preserve the food products from any deteriorative reactions.
- Examples: corn zein, whey protein, wheat gluten and soy protein.

2) Polysaccharide based films:



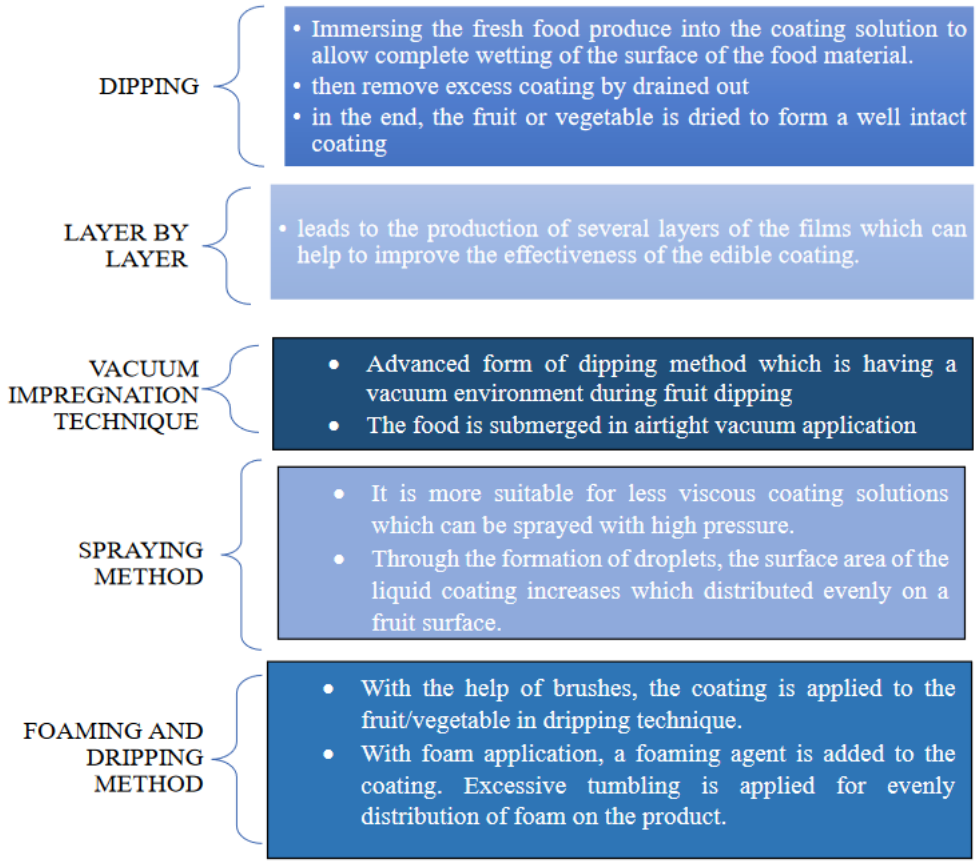
- Natural polymers used extensively to produce edible coating or films.
- Pectin, cellulose, starch, chitosan, alginates and pullulan are some types of polysaccharides used.
- Since they have hydrophilic nature, they form a poor barrier against water vapour.
- Commonly used to improve the shelf life of meat products, vegetables, fruits.

3) Lipids based coatings/films:



- The hydrophobic nature of them, makes them a very good material to be used in edible coating.
- Examples: wax and paraffin

METHODS OF APPLICATION:



ADVANTAGES AND DISADVANTAGES:

Advantages:

- Helps to maintain the quality during storage
- Retains colour, acid, sugars and flavour compounds of product
- Increases consumer appeal
- Ward off the ethylene production
- Retarded respiration rate and chlorophyll loss
- Reduction in weight and firmness loss

Disadvantages:

- Thick coating prohibits oxygen exchange leads to loss in quality
- Raw materials used for coating causes some allergic reactions when the product is consumed
- Some methods of coating incur high costs which results in price hike of commodity

CONCLUSION

Nowadays, consumer is aware of his health and move towards the use of chemical free food more. This has led to the arrival of edible coatings as a better alternative. These coatings are incorporated with essential oils, antimicrobials and other active ingredients that protects the food from spoilage and contamination. With these, the shelf life of the product is intensively increased too. It will be more present in the coming future. For its successful adoption, there is a need of more intensive research in aspect of safety and regulation, exploration of new and economic sources and how to increase commercialization by continuous production.