THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
February, 2023; 3(02), 182-185

Popular Article

Edible Coating to Enhance Shelf life of Perishable Fruit and Vegetables

Harish Kumar*, Julie D Bandral, Monika Sood and Duwa
Post-Harvest Management, Faculty of Horticulture
Sher-e-Kashmir University of Agricultural sciences and Technology-Jammu (J&K)
https://doi.org/10.5281/zenodo.7669503

Spoilage of fruits and vegetables has become a problem for the farmers in India, the main reason for this is the lack of proper methods of crop management. The postharvest loss for fruits and vegetables are estimated to be 30-40%. Fresh fruits and vegetables lose 20–30% of their value after harvest, according to estimates. Due the highly perishable of fruits and vegetables, cold storage is necessary to delay ripening-related changes such ethylene production, softening, colour changes, respiration rate, acidity changes and weight loss. When fruits and vegetables are transported and marketed, cold storage is not enough to maintain their quality at maximum level, often resulting in serious chilling injury symptoms. Therefore, it is important to combine cold storage with the appropriate postharvest technology. Only 30-40% of the total fruits and vegetables are used in India and only 2-5% of the production of fruits and vegetables is processed properly. To preserve fruits and vegetables from spoilage and enhance their shelf life, a solution has been found by the experts of crop production management department and that was edible coating.

What is Edible Coating in Food Preservation?

Edible coating is defined as the thin layer of edible material, which is applied on food surface in liquid form. Some of its basic functions are to protect the products from mechanical damage and chemical reaction as moisture barrier.

Published 23.2.2023

Benefits of Edible Coatings:

- **Improves Storage Quality by reducing**
  - ✓ Water loss
  - ✓ Gas diffusion
  - ✓ Movement of oils and fats
  - ✓ Loss of volatile flavors and aromas
- **Improve Sensory Quality**
  - ✓ Structural properties
  - ✓ Appearance
  - ✓ Adhesion to cooking
- **Improves Processing Quality**
  - ✓ Incorporates food additives
  - ✓ Properties of edible coating
  - ✓ Antimicrobial
  - ✓ Antioxidants
  - ✓ Anti-browning
  - ✓ Texture enhancing
  - ✓ Effective in extending the shelf-life

Types of Edible Coating:

There are various sources from which the edible coating can be developed. These are broadly classified as polysaccharides, lipids and proteins. They are mainly produced from biopolymers, proteins, polysaccharides (carbohydrate and gums), lipids and produced from food grade additives.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 23.2.2023

Protein based coatings are prepared with vegetal and animal proteins, including soy protein, wheat protein, corn zein, gelatin, peanut protein, casein etc. Sodium alginate-based coatings have potential applications in edible coating field because they act as antioxidants for shelf-life extension of fish and meat products and as anti-browning agents for fresh button mushroom and fresh cut fruits. Edible coatings are not chemically synthesized, it is natural. These coating are mainly used for good appearance and preservation of fruits and vegetables. The primary benefits of edible coating are non-toxic nature and inexpensive as compared to other chemically synthetic coating. The edible coatings are divided into three classes:

- Hydrocolloids: polysaccharides, alginate and protein.
- Lipids: waxes, fatty acids and acryl glycerides.

Edible Coatings Applied on Different Fruits and Vegetables:

Fresh fruits and vegetables are extremely perishable, and during harvest, processing, transportation, and storage, around 50% of fresh food degrades. The following are examples of fruits and vegetables that have been coated:

Fruits: Apple, Banana, Blueberry, Guava, Pistachio, Lemon, Papaya, Cherry, Orange, Grapefruit, Cherry, Papaya, Strawberry, Mango, Peach, fresh-cut Apple, fresh-cut Pear and Peach.

Vegetables: Tomato, Mushrooms, Cucumber, Capsicum, Processed Carrot, Fresh cut cabbage, Fresh-cut Tomato, Cut-onion, Pumpkin.

Is Edible Coating Harmful to Health?

Edible coating is made up of two things. The first one is microalgae extract and the second one is polysaccharide, which is a type of carbohydrate. The extract is derived from the marine microalgae *Dunaliella tertiolecta*. Algae oil is a plant-based alternative to fish oil and a supplement. After extracting the oil, the remaining material is thrown away. Edible coating is generally recognized as safe and are mostly tasteless and odorless. The main advantages of edible coating are nontoxic in nature.

Applying Techniques for Edible Coating:

- ✓ Dipping
- ✓ Spraying
- ✓ Brushing
- ✓ Extrusion

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com

Published 23.2.2023

- ✓ Solvent pouring

Advantages:

- ✓ The barrier properties of edible coatings are good against moisture, oxygen, carbon dioxide and ethylene.
- ✓ Acids, flavour, sugar and colour retention are improved by edible coatings.
- ✓ Preserve fruit and vegetable quality while being in storage.
- ✓ Reduce the amount of waste and packaging made of plastics.
- ✓ Slow down the loss of firmness and weight.
- ✓ Edible coatings, which contain nutrients that are good for your health, may be consumed with fruits and vegetables.

Introducing Herbal Edible Coatings:

Today herbal edible coating is used as a nutraceutical and beneficial for human health. Herbal edible coatings are made from herbs or others edible coatings. Such as most commonly herbs used in edible coatings are Aloe vera gel, Neem oil extract, Mint oil, Clove bud oil, Tulsi, Lemon grass and Turmeric. These herbs consist Antioxidants, vitamins and important minerals. These herbal edible coating act as antimicrobial and beneficial for human as a nutraceutical and medicines.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com

Published 23.2.2023