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The Use of Preservatives in Food: A Shift Toward Natural Alternatives



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Preservatives are defined as anything that elongates the shelf life of food. It helps to prevent the spoilage of food by microorganisms and enhance its flavor, taste, and color. It is estimated that a total of 2,00,000 tons of food preservatives are used annually [1]. Salt, honey, and sugar are the natural preservatives used to preserve food for centuries. With the increase in food demand, many chemicals have been prepared to preserve food more effectively and efficiently.

Artificial preservatives have increased greatly during the last decade because of modernization, the food industry, and media advertisement [2]. The artificial food preservatives can provide us with prompt effects but in the long run, it could act as a poison if constantly ingested. When converted into nitrous acid inside, these artificial preservatives can be toxic: nitrates and nitrites. These preservatives can cause cancer in various organs. Benzoates which are used as antimicrobial agents cause asthma, allergies, and rashes.

Sorbates, another class of antimicrobial agents, have a lower rate of conversion into harmful substances within the body. There are some reports claiming it causes skin conditions such as urticaria and dermatitis [3]. As a result of this, there is an increased public awareness of the harmful effects of artificial preservatives on health, leading the public to demand safer alternatives.

This demand led many researchers to find alternative natural preservatives that can give the same antimicrobial and antioxidant efficacy. The widely studied natural preservatives alternative to artificial preservatives are polyphenols. Polyphenols are the secondary metabolites produced by plants in response to infection, stress conditions, and UV exposure. Polyphenols have shown promising effects and no side effects on human health have been observed. It has been noticed that polyphenols have low stability, and their antioxidant activity is not efficient if they are directly used in food products. Various environmental factors such as heat, pH, electrolyte concentration, and oxidants affect their stability. Encapsulation has emerged as an effective solution to improve polyphenols' stability and controlled release in food products. It not only improves the stability and antioxidant character, but it is also seen that sensory characteristics (aroma, flavor, and food acceptability), shelf life, and antioxidant activity of polyphenols have shown better scores after encapsulation.

In conclusion, while artificial preservatives have been widely used for their effectiveness, growing concerns over their health implications have led to increased interest in natural alternatives like polyphenols. Encapsulation technology shows promise in addressing the challenges of polyphenol instability, offering a safer and more sustainable option for food preservation.

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