

Study on Food Preservation Methods and their Effect on Health

Harneet Kaur¹

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Abstract:

The increasing population have the demand of more food due to which the production is done. But these large amount of food is destroyed by the bacterial such as microorganism growth, fungus etc. These damage is a major loss in the agriculture field. So, there is a need to preserve the food products for a long period of time. From the history, many preservation methods are being used to maintain the quality of food product like thermal preservation. Now, preservation methods have been divided into two parts: natural preservation and artificial preservation. From using these methods, the longevity of the food can be increased. These preservatives help in the preservation of food but also give the adverse effects on the health in the disease like stomach cancer, immune system disorder. This review paper represents the prevention of food by different ways of preservation and also discuss about the adverse effects of them on the human health.

Keywords: *Microorganism, Natural and Artificial Preservatives, Disease*

Authors:

1. Panjab University, Chandigarh, INDIA

Introduction

For the survival on the earth, the needs of body is an essential that is accompanied by the availability and consumption of safe food. A significant role is played by the food and it's constitutes on human health. Food consumption has no limitation. Certain types of food with excessive consumption such as fat, sugar, and salt can harm the health of human. From the history of human civilization to till date, the safety of food is an important factor. The issue regarding the safety of food was raised after World War II. The spoilage of food is due to the activity of microorganism or many enzymatic reaction in the food during storage. This spoilage starts due to the presence of water, fat, carbohydrate, protein and small amount of organic compound and minerals in the food products. In developing countries, one third population is suffering from the diseases that are transmitted by the food. These diseases are caused by the microbial, physical and chemical factors.

To reduce the food spoilage problem, different methods of food preservation has been induced. Both natural (Pasteurization, freezing and drying) and Artificial (chemical methods) are helpful in the preservation of food. They not only reduce the growth of microbial but also maintain the antioxidant potential which is the need of consumer. The prevention of food or the delay in the food spoilage is done by the use of chemical substances that is a great success in the treatment of these diseases in humans, animal and plants. Different quantity and concentration are used for each preservative to maintain the food quality for reasonable time period.

The food preservation is defined as the additives that are used to prevent the food from spoilage by the inhibition of microorganism growth like yeast, molds, and bacteria. The quality, texture, consistency, taste, color alkalinity and acidity are maintained by different anti-oxidative reactions.

Natural preservation is also known as physical preservation that are used to exclude the air, moisture and microorganisms. Boiling, freezing, pasteurizing, dehydrating, smoking, pickling are the natural ways of food preservative. The combination of sugar with the alcohol works as a preservative for luxury products such as fruits in brandy and other spirits. Other preservative like salt, alcohol and vinegar are used as food preservatives as they decrease the growth of bacteria.

Artificial methods for the preservation of food are nuclear radiation, vacuum packing and hypobaric packing etc. Some chemicals are also worked as food preservatives such as benzoate, sorbates, sodium

nitrite are Antimicrobial Agents. The growth of bacteria, molds, insects and other microorganisms is inhibited by these preservatives.

Antioxidants are also come under the chemical preservatives. They act as free radical scavengers. There are some antioxidants such as vitamin E, vitamin C, Pine Bark Extract, Grape Seed Extract, Sodium Erythorbate, Acetate, Succinic Acid and Ascorbic Acid, Parabens, Erythorbic Acid, Propylphenols. Disodium ethylenediaminetetraacetic acid (EDTA), Polyphosphates, Citric acid and Ascorbic acid Monosodium Glutamate (MSG) Disodium Guanylate and Disodium Inosinate are the chelating agents which are used as a food flavouring agents.

The food is preserved by exposing the food to high energy ray is called food irradiation. This preservative method can replace the chemical preservatives as well as thermal treatment. It is also called as cold pasteurization which are currently used in many countries. In dairy products, gamma irradiation is the most important and peaceful application. The irradiation do not cause any hazard.

Harmful Effects of Food Preservatives

The chemicals that are used as a preservatives give certain harmful effects on human health.

Sulfites: It is mainly used in various fruits as a preservatives that create some adverse effect such as headaches, palpitations, allergies, and even cancer.

Nitrates and Nitrites: Used in meat as a curing agents. When it is consumed in the meat, the reaction occur and nitrites and nitrates are converted into nitrous acid and make a cause of stomach cancer, liver cancer, intestinal cancer and oesophageal cancer.

Benzoates: Due to use of it as preservation, skin rashes, allergies and asthma types of diseases are induced into the body. Sodium benzoate that enhance the life of food but it forms carcinogenic benzene with the vitamin C or ascorbic acid. The brain damage is also caused by the benzoate.

Sorbates/Sorbic Acid: It is an antimicrobial preservatives that cause the urticaria and contact dermatitis.

BHA or BHT: The full name is Butylated Hydroxyanisole and Butylated Hydroxytoluene. They help in preserving the fats and oils in food and cosmetics. National Toxicology Program researched on these preservatives and concluded that BHA gives potential carcinogen effect, while BHT has the record

of increment and decrement risk cancer in a number of studies.

Review of Literature

Sharma (2015) concluded that the shelf life of food and quality maintenance for a long time is used by the preservatives. But chemical preservatives give the side effects. It will be better to eat preservative free food.

Kebede et al. (2015) discussed about the irradiation that are used for the preservation of food. These radiation do not affect the health until proper preservation is done. This preservation method is safer than the non-irradiation method.

Jain and Mathur (2015) focused on the food additives such as food color and preservatives (benzoates, sorbate, sulphite, nitrite and nitrate). They all show the risk regarding to the health of humans. This paper discussed that a surveillance and monitoring system should be needed in developing countries to note the adverse effects of additive intake in the population.

Shahmohammadi, Javadi and Nassiri-Asl (2016) analyzed the effects of sodium benzoate as preservative on the human health and conclude that it gives a negative impact on the human health by damaging the cells. They studied the many research and said there is need of more study and research in food industry.

Samal, Gouda and Patra (2017) proposed that there is many risk to use the preservative for the food. There is a need of lots of researches to find out the natural and harmless preservatives i.e., Nisin Peptide. During the formulation of preservatives, special attention should be given for the improvement of shelf life as well as quality and health benefits.

Dar et al. (2017) stated that the consumption of food preservatives give the adverse effect in animals eczema, urticaria, angioedema, exfoliative dermatitis, irritable bowel syndrome, nausea, vomiting, diarrhoea, rhinitis, bronchospasm, migraine, anaphylaxis, hyperactivity, autoimmune diseases and other behavioural disorders. The main risk of food additives are on immune system. Hence, the research on this links the nutrition and immune system which not only reveal the molecular mechanism but also discover the various therapeutic that revert the ill effects.

Linke, Csagrande and Cardoso (2017) stated that consumption of preservative food give adverse effect on the human health. The consumption of sodium benzoate affect varies according to the species, the dose and exposure. Genotoxic, clastogenic, neurotoxic are responsible for the changes in cell cycle and intercalation in DNA structure. The study of sodium benzoate should be done further for better understanding of Genotoxic, immunological and behavioral effects.

Conclusion

Food preservatives are used in the food product to inhibit the growth of microorganism. Different types of food preservatives are available such as sodium benzoate, nitrite, sulphite and so on. With the longevity of the food products, they affect the human health as many incurable diseases are developed in body due to the use of these preservatives. This review paper concludes by the reviews and research of others that irradiation and natural preservatives are much better compare to the artificial preservatives and there is a need to study of these adverse effect and the development of new harmless preservatives for the food live longevity.



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