

## Review on the role of Food Preservatives and its Efficacy

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### ABSTRACT

The objective of this review is to examine the available safety/toxicity works on food preservatives. Preparing food abolishes some necessary nutrients such as vitamin C, it also destroys enzymes and beneficial bacteria present in the food. Foods are substances or mixture of substances both solid and liquid, which are intended for human consumption or ingestion for their nutritious of satisfying benefits. Food preservation may also include processes that inhibit visual deterioration, such as the enzymatic browning reaction in apples after they are cut during food preparation. Home food is safe if it contains sufficient nutritious food all the years so that all members can meet their nutrient needs with foods they like or prefer for an active and healthy life. People commonly get food by producing or buying. In times of food shortages they may receive free or subsidized food. To be food secure, people need enough food and a variety of food ingestion for their nutritional of pleasurable benefits. The classification of food, its storage and chemistry were treated in this study. Different methods of food preservations which include drying (freeze drying or spray drying,), freezing, vacuum-packing, canning, sugar crystallization, pickling, food irradiation, etc. and its effect were also reviewed.

*keywords: Drying; Agricultural products; Response surface methodology; Isolation; Fungi;*

### Introduction

Food preservation is used from the ancient times. Food preservatives becomes an essential thing nowadays, this plays an important role during food transportation. Preservatives are the substances, which are used to prevent food spoilage from microorganism. This will preserve the food for a long duration from the spoilage [1]. Food is an essential thing for human survival. Except our own garden plants, all the food used today has some preservatives. Recently, several microbial provoked teas got noticed in the Western place, probably not only because of trade expansions between west and china, but also because of several health beneficial claims associated with microbial fermented tea [2-6]. Food preservation comes under Fisheries, Animal Production and Health, Plant Production and Protection, and was engaged in food technology activities in their individual area of interest. Nutrition division's interest was mostly, in their nutritious relations specific in reducing

wastage of food, in preventing losses in nutritive value and in conserving or enhancing palatability. Preservation may be of any kind but it should be long lasting for preservation of food and it should be value your money [7-11]. An example of increasing a process would be to inspire fermentation of dairy products with microbes that convert lactose to lactic acid; an example of preventing a process would be stopping the browning on the surface of freshly cut Red Delicious apples using lemon juice or other acidulated water. Propyl and Methyl has been used as an anti-microbial preservative in foods, drugs and cosmetics for over 50 years [12-16]. There have been several previous safety assessments undertaken on this substance by several agencies, including FAO/WHO, FDA and FEMA [17-23].

## Food Preservatives Classification

Food preservations are commonly of three types:

- Natural Preservations
- Artificial Preservation
- Microbial Preservations

**Natural Preservation:** Form ages humans have been using preservatives to extend the shelf life of various foods, making them last longer and keeping their colour, taste and nutrients intact. These days' foods come with a lot of imitation preservatives, but there are several natural preservatives that you can use to preserve food as well [24-30]. Conference Series Ltd invites all the participants from all over the world to attend Food & Nutrition conference during May 22-24, 2017 at Las Vegas, Nevada, USA which includes prompt Keynote Presentations, Oral talks, Poster Presentations Young Research Forum and Exhibitions. Some well-known speaker like Zhaowei Zhang, Ministry of Agriculture is going to deliver his speech regarding "Simultaneous detection for multiplexed mycotoxins by using immunoassay and confirming methods in food". National Association of Citrus Juice Processors, USA; American Cheese Society, USA; The Association of Food Technology, Turkey; European Food Safety Authority, Italy; Canadian Food Inspection Agency, Canada; Association of Food Science and Technology of Basque Country, Spain; Institute of Food Technologists, USA; International Wine & Food Society, UK are the international society which they are used for back bone of the society and they stand for awareness among the people.

**Dehydration:** The term dehydration refers to the removal of water from food such that their nutrients are preserved and the food lasts for a longer period of time. Some foods may want simple methods such as the use of a fan to air dry the food. Some other foods require other techniques of dehydration [31-39]. Any method you decide to use, the aim should be to remove water from your food and still leave them edible for a long time to come, accomplished through heating. For best results, it is better if your food is sliced thinly so as to allow for faster dehydration [40-49]

Ensure that your food item is completely empty water before storing. If there is water locked in the middle of the food, food gets spoils easily, inedible food on your hands. Foods that are dehydrated can last for more than a year. There is no need to cool dehydrated foods. Different methods of food preservations which include drying (freeze drying or spray drying.), freezing, vacuum-packing, canning, sugar crystallization, pickling, food irradiation, etc. (FIG 1) and its effect were also reviewed.



**FIG. 1: Homemade Dehydration**

**Vinegar:** Foods last longer if they are dipped in vinegar. The good thing about vinegars is that they come in a variety of flavors. Even though vinegars are used in removal table tops and dirty clothes of unsafe germs, they are also very useful in food preservation [50-55]. (FIG 2)



**FIG. 2: Vinegar Food Preservation**

**Fermentation:** Fermentation can actually switch spoilage through the simple technique of bearing your food to spoil in a controlled manner. Instead of permitting food to spoil with the help of harmful microbes, they do so with the aid of useful microbes [56-62]. In the same manner they produce alcohol which will help to preserve the food and make it last longer than it would naturally do, fermentation of alcohol is done by yeast and other foods that are fermented by useful bacterial and fungi include bread, cheese, beer, wine pickles, chocolate, and cured meats[63-68].

OMICS International successfully hosted its 6th Global Summit and Expo on Food & Beverages at Hyatt Regency Orlando International Airport, Florida, USA during August 03-05, 2015. The conference was organized around the theme “Modern & Sustainable Practices in Food and Beverage Sector” it was a great success where eminent keynote speakers from various reputed organizations made their resplendent presence and addressed the gathering [69-72]. (FIG 3)



**FIG. 3: Fermentation Food Preservation**

**Sugar:** Sugar works by dehydrating the food as well as the microbes present in the food. By using this way the microbes are preventing from contributing to decomposition. Mold and yeast cannot grow in food pretreated with salt food preserved this way could last for years [73-79]. Food preservatives are the organic substances which are used in food making to slow down decay, discoloration, or detoxification by microorganism. The substance intended use of which results directly or indirectly, in it's becoming a component or otherwise affecting the characteristics of food and their use, therefore, is regulated by artificial flavoring agents [80-82].

### **Does every one of us need artificial food preservatives?**

The main classes of artificial preservatives area unit antimicrobials, antioxidants, and chelating agents. Anti-microbial preservatives facilitate to stop the overgrowth of bacterium and mould. These embrace benzoates found in several beverages, sorbates help to stop mould, yeast and fungi growth in foods and beverages, proprionates mold inhibitors utilized in baked goods, nitrates and nitrites [help to stop microorganism overgrowth, most notably eubacterium botulinum] [83-89]. Common antioxidants wont to facilitate stop discoloration embrace sulfites, artificial vitamin E, vitamin C, butylated hydroxyanisole (BHA), and butylated hydroxytoluene (BHT). Chelating agents like EDTA, polyphosphates and acid facilitate to bind metals, sometimes copper and iron to stop the metals from oxidizing and dashing up spoilage.

### **Artificial Preservatives**

The artificial food preservatives sometimes act as the antioxidants , They make their food more acidic , They reduce the moisture level of the food , They slow down the ripening process and they prevent the microbes growth , Not all of these additives are 100-percent safe and artificial food preservatives help the food stay for longer period [90-92]. You have to know that there are many food additives particularly the nitrites, the aspartame, the saccharin and the benzoates which have been linked to the cancer because they produce the carcinogenic compounds when they are metabolized.

Potassium Bromate must be banned, it is kind of food preservative that is used to support the bread dough, It is a stronger gluten structure in the tough that means it clamps more air and it has a better capacity, It creates a larger-looking loaf of bread that has fewer ingredients, Potassium Bromate is a carcinogen causing the tumors in the kidneys and thyroid. (FIG 4)

## List of food additives

- Acidity regulators
- Bulking agents
- Food coloring
- Stabilizer
- Sweeteners
- Thickeners
- Tracer gas
- Glazing agents



FIG. 4: **Artificial Food Preservatives**

Microorganisms are the main causes for food decay and food poisoning and therefore food preservation procedures are directed towards them. Food preservation techniques currently used by the industry trust either on the inhibition of microbial growth or on microbial inactivation. Methods which prevent or slow down microbial growth cannot completely assure food safety, as their efficacy depends on the environmental conditions such as, for instance, the maintenance of the chill chain. Thermal treatment is generally used procedure for microbial inactivation in foods. However, heat causes unwanted side-effects in the sensory, nutritional and functional properties of food [93-95].

Radioactivity, ultrasound under pressure, is active methods to inactivate vegetative micro-organisms in foods, but the high flexibility of bacteria limits their use as a sole method for food preservation. Therefore, these fresh skills are finding applications as hurdles that assure food safety through microbial inactivation in minimally processed high quality products. Development of mathematical models based on physiological facts to establish treatment conditions is urgently needed. Ideally, models should consider the dangerous event or events leading to death, the heterogeneity within the bacterial population and possible phenomena of adaptation and damage. (Table 1)

Some of microbial society are Produce Marketing Association, USA; Scotland Food & Drink, Scotland; Scotty Brand Ltd, Scotland; Southern Hemisphere Association of Fresh Fruit Exporters, USA; Specialty Coffee Association of Indonesia, Indonesia; Specialty Food Association, USA; Specialty Wine Retailers Association, USA [96-98].

**Table 1: Microbial Preservations of Food**

Dry foods	Contain insects/dirt, look or smell mould, bag is broken, legumes are wrinkled, flour is uneven.
Roots	Soft, damaged, rotten spots, budding,
Vegetables and fruits	Wilted, bruised, too soft, rotten spots.
Meat, poultry and fish	Bad smell or colour, fish have dull eyes, loose scales. Uninspected meat, liver and some dangerous parasites
Fresh milk	Smells bad, exposed to dirt and flies.
Canned foods	Can is swollen, rusty or damaged; food has leaked out; food looks, smells or tastes bad. Any of these signs means the food may be very poisonous.

**Developing food production and storage:** Farmers may be able to increase the amount and types of foods they produce by:

- Traditional methods should be improved for e.g. mulching, composting, intercropping, fertilizing, including use of green manure
- Higher yielding seeds or growing crops that mature early or are drought resistant should be used
- Variety of foods grown, especially vegetables and fruits should increase
- Joining cooperatives to buy fertilizer or other agricultural resources
- Harvesting water for small-scale irrigation and people need to be educated.

Agriculture and Food 2016, 4th International Conference Elenite, Bulgaria, 20th June, 2016. International Conference on Advances in Human Nutrition, Food Science & Technology, Toronto, Canada, 26th June, 2016; Nutrition Conferences Europe June 16-18, 2016, Rome; Each and every country should have ample food control strategy to make sure that national food supplies are secure with good quality and available sufficiently at affordable cost to ensure a stable nutritional and health status for entire population [97-100]. Food control system includes all activities to ensure the quality, safety and honest presentation of the food that to from primary production, processing and storage, then to marketing and consumption.

**Conclusion**

Food preservation is a process of slowing down food from becoming bad. Besides making the food lasts for longer, preservation also prevents food wastage. There are certain methods to follow for food preservation it keeps food for longer duration and maintains sufficient nutrients. Nutritious food should be preserved for better health and also people need write method of education over it. Preservations by low temperature techniques are superior to other methods of long term preservation. Preservation food is necessary because food is liable for spoilage due to the action of microorganism insects and enzymes.

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