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Title Key: Role of Chemistry In Development of Food...

Role of Chemistry In Development of Food Processing Industries

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Abstract

In the present research paper the study of the role of some selected chemicals which is employed as food additives in industry like nitrites and nitrate, Sulfites and sulphur dioxide aspartame, Alginate, propylene glycol was done. The impact of food additives on the quality of food and feasible changes in flavor, test and appearance etc are highlighted. Study shows that the uses of chemistry as a tool to analyze food items so that they transform to nutritious, safe and materials of commercial value. Instruments that are popular in the vicinity of chemistry are employed in food chemistry.

Keywords: Food processing, Food additives, Preservatives, Flavor, Artificial sweetener.

1. Introduction

In the era of 21 st century the food culture of the world changes extremely due to the term globalization the goods and services exchanges globally and challenges before the food processing industry increases day by day hence need to take help of chemistry in the processing industry . [2]In ancient time periods the sun and wind would have naturally dried foods. Evidence shows that Middle East and oriental cultures aggressively dried foods as early as 12,000 B.C. in the hot sun. Later cultures left more evidence and each would have methods and materials to reflect their food supplies fish, wild game, domestic animals, etc. Vegetables and fruits were also dried from the initial times. [4]In the Middle Ages purposely built "still houses" were created to dry fruits, vegetables and herbs in areas that did not have enough strong sunlight for drying. A fire was used to create the heat needed to dry foods and in some cases smoking them as well. [8]The scientific approach to food and chemistry arose with attention to agricultural chemistry. Chemicals are essential building blocks for everything in the world. All living matter, including people, animals and plants, consists of chemicals. [1]All food is made up of chemical substances. Chemicals in food are largely harmless and often desirable – for example, nutrients such as carbohydrates, protein, fat and fibers are composed of chemical compounds. Many of these occur naturally and contribute both to a rounded diet and to our eating. [9]Chemical food additives preserve shelf life by falling or eliminating the growth of microorganisms that cause food decay. [11]These added chemicals are divisive as some may have a detrimental effect on your health. Eating fresh, whole foods may be a safe alternative to avoiding these chemical additives used in food processing. [3]Food chemistry allows for subjecting food materials to chemical scrutiny. It uses chemistry as a tool to analyze food items so that they transform to nutritious, safe and materials of commercial value. Instruments that are popular in the vicinity of chemistry are employed in food chemistry.Flavors, preservatives, emulsifiers, thickeners,

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stabilizers, sweeteners, colors are some of the materials that are produced from food chemistry. And a consideration of the development of these materials from their crude source through research, development, production, regulation and commerce; would telltale of how expansive is the importance of food chemistry.[1]Undesirable chemicals can be formed in certain foods during processing as a result of reactions between compounds that are natural components of the food. In some cases an unwanted chemical may be formed as a result of a food additive being deliberately added to food and reacting with another compound in the food. [9]When foods are processed then there are reactions that occur between components of the food, resulting in the desired test and manifestation of the food. However, some of these reactions can lead to the production of undesirable compounds. Similarly, certain storage or processing conditions may allow reactions to occur that otherwise would not. [10]These reactions could generate potentially hazardous compounds. Such chemicals can be collectively referred to as food-processing-induced chemicals. Some of these chemical reactions involve naturally-occurring components in the food, while other reactions may involve food additives, ingredients, or food packaging materials that were intentionally used.

In many cases, the presence of processing provoke chemicals in food cannot be avoid; however, understanding the processes by which these products are formed can allow us to optimize or adjust food preparation methods, formulae or processes, thereby reducing or eliminating the formation of such chemicals.

2. Methodology:

The data for study were collected from different resources in which most foods contain enzymes or natural chemicals, such as acids or alcohols that cause them to begin to lose desirable characteristics almost immediately after harvest or preparation. In addition, a host of environmental factors, such as heat and the presence of microorganisms, acts to change foodstuffs in ways that may harm the food product. Food preservation traditionally has three goals: the preservation of nutritional characteristics, the preservation of emergence, and a prolongation of the time that the food can be stored. Traditional methods of preservation usually aim to exclude air, moisture, and microorganisms, or to provide environments in which organisms that may causes spoilage cannot endure.

3. Chemicals include in food-processing:

Nitrites and nitrate

Nitrites and nitrate are efficient antimicrobials that protect alongside the botulism bacterium; however, they are known to be a health hazard. According to Richard Scanlon, of the Linus Pauling Institute, nitrites react with specific amino acids in the digestive system causing the formation of nitrosamines, substances known to cause cancer. Sodium nitrate, treated as a color stabilizer, slowly metabolizes into nitrites. Certain brands of products commonly contain nitrites and nitrates are bacon, cured meats, tobacco products and hot dogs.

Sulfites and Sulphur Dioxide

Sulfites and sulphur dioxide are together antimicrobials, used primarily as preservatives. Sulfites are found predominately in dried fruits and red wine, and occasionally in certain brands of fruit juices. Sulphur dioxide is used in several foods. This compound slows the oxidation of fats called lipids. When sprayed on freshly harvested fruits and vegetables, it stops the natural ripening process. These two compounds can cause an allergic reaction in certain individuals and is a known allergen for numerous asthmatics drugs.

Alginate, Propylene Glycol Alginate

Alginate is a naturally derived compound of kelp, or seaweed, and is used as a thickening agent and foam stabilizer. However, propylene glycol alginate is a chemically adapted substance, utilizing aligns to thicken foods with a higher acid content such as beer, soft

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drinks and salad dressing. Alginate is used in milk products such as ice cream, cheese, cottage cheese and yogurt etc.

***4*. Aspartame**

This compound, according to the Center for Science in the Public importance is one that should be avoided. Aspartame is a combination of amino acids and methanol. This chemical compound may cause cancer and other health-related problems, though more rigorous studies are needed to confirm a connection. Used as an artificial sweetener, Aspartame is used in diet foods in place of sugar, and used primarily in soft drinks and drink mixes, and many low-calorie, processed fresh and frozen desserts. Jam and Jelly Preservation with the employ of honey or sugar was well known to the earliest cultures. Fruits kept in honey were common place. In ancient Greece quince was mixed with honey, dried somewhat and packed tightly into jars. The Romans enhanced on the method by cooking the quince and honey producing a solid texture. The same fervor of trading with India and the familiarize that brought pickled foods to Europe brought sugar cane.

Factors contributing towards quality of food

- **Nutritional value**
- Appearance
- Color
- Taste
- Odor
- Adulterants
- Contaminants (Physical, Chemical & Microbiological

Chemical Preservatives

- Chemical preservatives
  - ❖Interfere with the cell membranes of microorganisms,
  - ❖their enzyme activity or then genetic mechanisms.
- Preservatives may also serve
  - ❖ as antioxidants,
  - ❖as stabilizers,
  - ❖firming agents
  - ❖ as moisture retainers.
- Chemicals that function to preserve the food are generally added after the food has been processed and before it is packaged.

5. Conclusion:

From the above study it is observe that the interference and need of chemistry in the field of food processing industry increases day by day. This study has examined the chemistry of food and the most essential aspects of study was the examined the additives and preservatives. Additives have been used for many years to preserve, flavor, blend, thicken and color foods, and have played a vital and essential role in reducing serious nutritional deficiencies. Additives help to assure the availability of wholesome, appetizing and reasonable foods that meet consumer's demands from season to season. The existence or absence of additives in a specific food product can only be supplied by the food manufacturer.

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