

***SM Department***

***English Module***

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***L2Chemistry***

## **Lesson 05: Food Additives**

For centuries, ingredients have served useful functions in a variety of foods. Our ancestors used salt to preserve meats and fish, added herbs and spices to improve the flavor of foods, preserved fruit with sugar. Today, consumers demand and enjoy a food supply that is flavorful, nutritious, safe, convenient, colorful and affordable. Food additives and advances in technology help make that possible.

### **❖ What are Food Additives?**

Food additive refers to any substance, either natural or synthetic, intentionally added to food for a technological purpose in the processing, packaging, transport or storage of such food. There are currently some 20 functional classes, with over 2 000 different kinds of food additives. Majority of prepackaged foods available on the market contain one or more kinds of food additives.

### **❖ Common Reasons for Food Additives:**

Additives in foods are used for one or more of the following reasons:

- 1.** To maintain palatability and wholesomeness: Preservatives retard food spoilage caused by mold, air, or bacteria. Antioxidants in foods are preservatives that prevent fats and oils from becoming rancid in foods. Rancid, or oxidized fats, taste bad and may increase tumor risk. Antioxidants also prevent fresh fruits from turning brown and becoming spoiled after they are cut.
- 2.** To enhance flavor or impart desired color: Low calorie sweeteners, and cloves are examples of additives that enhance product flavor. Ingredients including caramel, beet juice (natural colors) are examples of color additives that impart desired color to foods.
- 3.** To maintain product consistency: Without additives such as emulsifiers, your peanut butter and mayonnaise, for example, would be separated in the jar or bottle. There would be a great deal of stirring and shaking going on, and the foods would appear to be spoiled. Anti-caking agents, such as sodium aluminosilicate, keep substances, including salt and tea, flowing freely.
- 4.** To provide leavening or control acidity and alkalinity: Leavening agents, such as sodium bicarbonate, help foods rise during baking. Other additives, including fumaric acid

and lactic acid, are used to alter the acidity or alkalinity of a food for better flavor and color.

### ❖ Types of Food Additives

<b>Types of Ingredients</b>	<b>What They Do</b>	<b>Examples of Uses</b>	<b>Names Found on Product Labels</b>
<b>Preservatives</b>	Prevent food spoilage from bacteria, molds, fungi, or yeast (antimicrobials); slow or prevent changes in color, flavor, or texture and delay rancidity (antioxidants); maintain freshness	Fruit sauces and jellies, beverages, baked goods, cured meats, oils and margarines, cereals, dressings, snack foods, fruits and vegetables	Ascorbic acid, citric acid, sodium benzoate, calcium propionate, sodium erythorbate, sodium nitrite, calcium sorbate, potassium sorbate, BHA, BHT, EDTA, tocopherols (Vitamin E)
<b>Sweeteners</b>	Add sweetness with or without the extra calories	Beverages, baked goods, confections, table-top sugar, substitutes, many processed foods	Sucrose (sugar), glucose, fructose, sorbitol, mannitol, corn syrup, high fructose corn syrup, saccharin, aspartame, sucralose, acesulfame potassium (acesulfame-K), neotame
<b>Color Additives</b>	Offset color loss due to exposure to light, air, temperature extremes, moisture and storage conditions; correct natural variations in color; enhance colors that occur naturally; provide color to colorless and "fun" foods	Many processed foods, (candies, snack foods margarine, cheese, soft drinks, jams/jellies, gelatins, pudding and pie fillings)	FD&C Blue Nos. 1 and 2, FD&C Green No. 3, FD&C Red Nos. 3 and 40, FD&C Yellow Nos. 5 and 6, Orange B, Citrus Red No. 2, annatto extract, beta-carotene, grape skin extract, cochineal extract or carmine, paprika oleoresin, caramel color, fruit and vegetable juices, saffron (Note: Exempt color additives are not required to be declared by name on labels but may be declared simply as colorings or color added)
<b>Flavors and</b>	Add specific flavors (natural	Pudding and pie fillings, gelatin	Natural flavoring, artificial flavor,

<b>Spices</b>	and synthetic)	dessert mixes, cake mixes, salad dressings, candies, soft drinks, ice cream, BBQ sauce	and spices
<b>Nutrients</b>	Replace vitamins and minerals lost in processing (enrichment), add nutrients that may be lacking in the diet (fortification)	Flour, breads, cereals, rice, macaroni, margarine, salt, milk, fruit beverages, energy bars, instant breakfast drinks	Thiamine hydrochloride, riboflavin (Vitamin B <sub>2</sub> ), niacin, niacinamide, folate or folic acid, beta carotene, potassium iodide, iron or ferrous sulfate, alpha tocopherols, ascorbic acid, Vitamin D, amino acids (L-tryptophan, L-lysine, L-leucine, L-methionine)
<b>Emulsifiers</b>	Allow smooth mixing of ingredients, prevent separation  Keep emulsified products stable, reduce stickiness, control crystallization, keep ingredients dispersed, and to help products dissolve more easily	Salad dressings, peanut butter, chocolate, margarine, frozen desserts	Soy lecithin, mono- and diglycerides, egg yolks, polysorbates, sorbitan monostearate

#### ❖ Direct & Indirect Food Additives:

**Direct** food additives are those that are added to a food for a specific purpose in that food. For example, xanthan gum -- used in salad dressings, chocolate milk, bakery fillings, puddings and other foods to add texture -- is a direct additive. Most direct additives are identified on the ingredient label of foods.

**Indirect** food additives are those that become part of the food in trace amounts due to its packaging, storage or other handling. For instance, minute amounts of packaging substances may find their way into foods during storage. Food packaging manufacturers must prove to the U.S. Food and Drug Administration (FDA) that all materials coming in contact with food are safe before they are permitted for use in such a manner.

### ❖ **Are Food Additives Safe?**

Generally speaking, food additives should be applied in a way such that minimum amount is added to achieve the desired technological effect. Since majority of prepackaged food contains food additives, we are exposed to different types of food additives during daily food consumption. The prime food safety concern of food additives is whether the amount you consume in the long run exceeds the safety reference value .

Food additives are generally of low toxicological concern and their normal use in food in accordance with Good Manufacturing Practice does not represent a health hazard. Even if you consume a product with excessive use of certain food additive, it does not necessarily mean that your health is at risk. For chronic health effects, your overall dietary intake of that food additive over a long period of time is important, since your average intake in the long run may not exceed the safety reference value.

### ❖ **Advice to the Public**

The public is advised to take a balanced diet so as to avoid excessive exposure to food additives from a small range of food items. People with allergic conditions, such as asthma patients, may experience hypersensitive reaction due to certain kinds of food additives like sulphur dioxide and should be careful when selecting food. Advice from medical professionals may be sought when necessary.