#  Lec.8 Food additive

**Food additives are substances added to**[**food**](https://en.wikipedia.org/wiki/Food)**to preserve**[**flavor**](https://en.wikipedia.org/wiki/Flavor)**or enhance its taste, appearance, or other qualities. Food additives play a key role in maintaining the food qualities and characteristics that consumers demand and keeping food safe. Food additives are very carefully regulated and the general criteria for their use is that they perform a useful purpose, are safe and do not mislead the consumer. Some food additives help to keep foods fresh and safe, they help increase shelf-life by protecting foods against deterioration caused by oxidation or by micro-organisms.**

 **Food additives can be divided into several groups, although there is some overlap because some additives exert more than one effect. For example, salt is both a preservative as well as a flavor.**

**1-** [**Acidulents**](https://en.wikipedia.org/w/index.php?title=Acidulent&action=edit&redlink=1)

**Confer sour or acid taste. Common acidulents include**[**vinegar**](https://en.wikipedia.org/wiki/Vinegar)**,**[**citric acid**](https://en.wikipedia.org/wiki/Citric_acid)**, and**[**lactic acid**](https://en.wikipedia.org/wiki/Lactic_acid)**.**

**2- Acidity regulators**

[**Acidity regulators**](https://en.wikipedia.org/wiki/Acidity_regulator)**are used for controlling the**[**pH**](https://en.wikipedia.org/wiki/PH)**of foods for stability or to affect activity of enzymes.**

**3- Antifoaming agents**

[**Antifoaming agents**](https://en.wikipedia.org/wiki/Defoamer)**reduce or prevent foaming in foods.**

**4- Antioxidants**

**Antioxidants prevent the oxidation of foods that results rancidity or discoloration, they are used in baked foods, cereals, fats, oils and salad dressings.**

**# Tocopherols, BHA (butylated hydroxyanisole) and BHT (butylated hydroxytoluene) - these protect edible fats, vegetable oils and salad dressings from turning rancid.**

**#Ascorbic acid and citric acid - which preserve the colour of freshly cut fruits and vegetables.**

**5- Bulking agents**

**Bulking agents such as**[**starch**](https://en.wikipedia.org/wiki/Starch)**are additives that increase the bulk of a food without affecting its taste.**

**6- Food coloring**

[**Colorings**](https://en.wikipedia.org/wiki/Food_coloring)**are added to food to replace colors lost during preparation or to make food look more attractive.**

**7- Fortifying agents**

[**Vitamins**](https://en.wikipedia.org/wiki/Vitamin)**,**[**minerals**](https://en.wikipedia.org/wiki/Mineral_%28nutrient%29)**, and**[**dietary supplements**](https://en.wikipedia.org/wiki/Dietary_supplement)**to increase the nutritional value.**

**8- Color retention agents**

[**Color retention agents**](https://en.wikipedia.org/wiki/Colour_retention_agent)**are used to preserve a food's existing color.**

**9- Emulsifiers**

[**Emulsifiers**](https://en.wikipedia.org/wiki/Emulsion#Emulsifiers)**allow water and oils to remain mixed together in an**[**emulsion**](https://en.wikipedia.org/wiki/Emulsion)**, as in**[**mayonnaise**](https://en.wikipedia.org/wiki/Mayonnaise) **and**[**ice cream**](https://en.wikipedia.org/wiki/Ice_cream)**.**

**10- Flavours**

**Flavouring agents – which are added to food to improve aroma or taste – make up the greatest number of additives used in foods. There are hundreds of varieties of flavourings used in a wide variety of foods, from confectionery and soft drinks to cereal, cake, and yoghurt. Natural flavouring agents include nut, fruit and spice blends.**

**11- Flavour enhancers**

[**Flavour enhancers**](https://en.wikipedia.org/wiki/Flavor)**enhance a food's existing flavours; a popular example is**[**monosodium glutamate**](https://en.wikipedia.org/wiki/Monosodium_glutamate)**.**

**12-Flour treatment agents**

[**Flour treatment agents**](https://en.wikipedia.org/wiki/Flour_treatment_agent)**are added to**[**flour**](https://en.wikipedia.org/wiki/Flour)**to improve its color or its use in**[**baking**](https://en.wikipedia.org/wiki/Baking)**.**

**13- Tracer gas**

[**Tracer gas**](https://en.wikipedia.org/wiki/Tracer-gas_leak_testing_method)**allows for package integrity testing preventing foods from being exposed to atmosphere, thus guaranteeing shelf life.**

**14- Preservatives**

[**Preservatives**](https://en.wikipedia.org/wiki/Preservative)**prevent or inhibit spoilage of food due to**[**fungi**](https://en.wikipedia.org/wiki/Fungus)**,**[**bacteria**](https://en.wikipedia.org/wiki/Bacteria)**and other**[**microorganisms**](https://en.wikipedia.org/wiki/Microorganism)**, they are used in baked foods, wine, cheese, cured meats, fruit juices and margarine.**

**15- Stabilizers**

[**Stabilizers**](https://en.wikipedia.org/wiki/Stabilizer_%28chemistry%29)**, thickeners and gelling agents, like**[**agar**](https://en.wikipedia.org/wiki/Agar)**or**[**pectin**](https://en.wikipedia.org/wiki/Pectin)**(used in**[**jam**](https://en.wikipedia.org/wiki/Fruit_preserves)**for example) give foods a firmer texture.**

**16- Sweeteners**

[**Sweeteners**](https://en.wikipedia.org/wiki/Sugar_substitute)**are added to foods for flavouring, sweeteners other than**[**sugar**](https://en.wikipedia.org/wiki/Sugar)**are added to keep the**[**food energy**](https://en.wikipedia.org/wiki/Food_energy)**(**[**calories**](https://en.wikipedia.org/wiki/Calorie)**) low, or because they have beneficial effects regarding**[**diabetes**](https://en.wikipedia.org/wiki/Diabetes_mellitus) **,**[**tooth decay**](https://en.wikipedia.org/wiki/Dental_caries) **and**[**diarrhea**](https://en.wikipedia.org/wiki/Diarrhea)**.**

**17- Thickeners**

[**Thickening agents**](https://en.wikipedia.org/wiki/Thickening_agent)**are substances which, when added to the mixture, increase its**[**viscosity**](https://en.wikipedia.org/wiki/Viscosity)**without substantially modifying its other properties.**

**#Some food additives are worse than others. Here’s a list of the top food additives to avoid:**

**1. Artificial Sweeteners**

**Aspartame is found in foods labeled "diet" or "sugar-free". Aspartame is believed to be carcinogenic and accounts for more reports of adverse reactions than all other foods and food additives combined. Aspartame is a neurotoxin and carcinogen, the components of this toxic sweetener may lead to a wide variety of ailments including brain tumor, diseases like lymphoma, diabetes, Parkinson's, Alzheimer's, and chronic fatigue, emotional disorders like depression and anxiety attacks, dizziness, headaches, nausea. Acesulfame-K, a relatively new artificial sweetener found in baking goods, gum and gelatin, has not been thoroughly tested and has been linked to kidney tumors. Found in diet or sugar-free sodas, diet coke, coke zero, desserts, sugar-free gum, breath mints, toothpaste.**

**2. High Fructose Corn Syrup**

**High fructose corn syrup is a highly-refined artificial sweetener; it increases your LDL (“bad”) cholesterol levels, and contributes to the development of diabetes and tissue damage, among other harmful effects.**

**Found in most processed foods, bread, candy, flavored yogurts, salad dressings, canned vegetables, cereals.**

**3. Monosodium Glutamate (MSG)**

**MSG is made up of sodium and glutamic acid used as a flavor enhancer in soups, salad dressings, chips, regular consumption of MSG may result in adverse side effects which include depression, disorientation, eye damage, fatigue, headaches, and obesity.**

**Found in many snacks, chips, cookies, soup products, frozen dinners and lunch meats.**

**4. Trans Fat**

**Tran's fat is used to enhance and extend the shelf life of food products and is among the most dangerous substances that you can consume. Found in deep-fried fast foods and certain processed foods made with margarine or partially hydrogenated vegetable oils, trans fats are formed by a process called hydrogenation. Numerous studies show that trans fat increase LDL cholesterol levels while decreasing HDL (“good”) cholesterol, increases the risk of heart attacks, heart disease, and strokes, and contributes to increased inflammation, diabetes, and other health problems. Found in margarine, chips and crackers, baked goods, fast foods.**

**5. Common Food Dyes**

**Studies show that artificial colorings which are found in soda, fruit juices, and salad dressings, may contribute to behavioral problems in children. Animal studies have linked some food colorings to cancer. Its cause thyroid cancer increases the number of kidney and adrenal gland tumors and chromosomal damage in laboratory animals.**

**Found in fruit cocktail, ice cream, candy and carbonated beverages, bakery products, lemonade and more!**

**6. Sodium Nitrate**

**Sodium nitrate is used as a preservative, coloring, and flavoring in ham, hot dogs, lunch meats, smoked fish and other processed meats. This ingredient is actually highly carcinogenic once it enters the human digestive system. There, it forms a variety of nitrosamine compounds that enter the bloodstream and wreak havoc with a number of internal organs: the liver and pancreas in particular. Sodium nitrite is widely regarded as a toxic ingredient, its turn meats bright red, it's actually a color fixer, and it makes old, dead meats appear fresh and vibrant.**

**7. BHA and BHT**

**Butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT) are preservatives found in cereals, chewing gum, potato chips, and vegetable oils. This common preservative keeps foods from changing color, changing the flavor or becoming rancid, its affects the neurological system of the brain, alters behavior and has a potential to cause cancer.**

**8. Potassium Bromate**

**An additive used to increase volume in some white flour, bread, and rolls, potassium bromate is known to cause cancer in animals.**

***Food additive advantages and disadvantages*:**

***Advantages*: Some additives improve or maintain the food's nutritive value, Vitamins A, C, D, E, thiamine, niacin, riboflavin, pyridoxine, folic acid, calcium carbonate, zinc oxide and iron are often added to foods such as flour, bread, biscuits, breakfast cereals, pasta, margarine, milk, iodized salt and gelatin desserts. Alpha-tocopherol is another name for vitamin E, and beta carotene is a source of vitamin A. In addition to providing nutrients, food additives can help reduce spoilage, improve the appearance of foods and increase the availability of a variety of foods throughout the year.**

 ***Disadvantages*: Food additives sometimes destroy vitamins in food, replace real ingredients, the bright colors might make you believe you're eating something healthier, while in reality you might be drinking diluted juice that's full of sugar. Some food additives are toxic if a large amount is used, e.g. sodium benzoate and benzoic acid. Not only that, but some food additives may be carcinogenic, e.g. sodium nitrate has been shown to cause cancer to mice and may also cause cancer to human beings. Some people are allergic to particular food additives and additives may cause side effects such as allergies, gastric irritation, diarrhea, rashes, asthma, nausea, respiratory irritation and hyperactivity. However, not all people taking these food additives will have these side effects and these side effects differ from person to person.**