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Review Article

Artificial Preservative, Food Additives and Their Alternatives Special Reference to Natural Alternatives

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ABSTRACT

Consumer demand of austerely processed foods without artificial preservatives has led to a growing attention in their substitution for new natural alternatives. The pressing issue to feed the escalating world population has twisted a demand to augment food production, which has to be cheaper, but at the same time must meet towering quality standards. Taste, appearance, texture, and microbiological safety are required to be preserved within a foodstuff for the longest period of time. Although substantial improvements have been met in terms of food additives, some are still enveloped in controversy. The lacks of uniformity in worldwide laws regarding additives, along with contradictory outcome of many studies help foster this controversy. In this report, the most important preservatives, nutritional additives, coloring, flavoring, texturizing, and miscellaneous agents are analyzed in terms of safety and toxicity. Natural additives and extracts, which are gaining interest due to changes in consumer habits are also evaluated in terms of their benefits to health and combined effects. Technologies, like edible coatings and films, which have helped overcome some drawbacks of additives, but still pose some disadvantages, are briefly addressed. Food preservative is a class of food additive that help to prevent food spoilage by preventing the growth and proliferation of pathogenic microorganisms like *Clostridium* spp , *Bacillus cereus* and *Staphylococcus aureus*. This can be achieved by bringing down the pH of the food so as to make the environment unfavorable for these microbes. Onion is widely used as a food ingredient and it is known as a good source of bioactive compounds, such as sulphur-containing compounds and flavonoids with well known health beneficial effects, antioxidant and antimicrobial capacities. Preservatives, whether natural or artificial, work as in three different ways: Antimicrobial, Antioxidants and Act on enzymes. In antimicrobial, the growth of microbes like bacteria and fungi is inhibited. In antioxidants the process of oxidation is either delayed or stopped. And the one that acts on enzymes stops the ripening or aging of food product. Preservation is important part in many industries, such as the cosmetic and pharmaceutical industries, as the shelf life of many cosmetic and pharmaceutical products is important The present review is an extensive compilation of various preservatives obtained from plants, animal and microbial source.

INTRODUCTION

Preservatives are substances that are added to fruits, vegetables prepared from food items, cosmetics and pharmaceuticals in order to arrest or retard their fermentation. Antimicrobial preservatives might be considered exceptions to such categorization, being added to help improve antimicrobial stability and hence requiring antimicrobial activity. Their presence is mandated for multi dose liquid and semi solid products and performance standards are defined in compendial monographs[1, 2].

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Classification of preservatives:

Preservatives are classified into two main classes: Artificial Preservatives and Natural Preservatives.

Artificial Preservatives:

These are chemical substances of synthetic origin used to prevent spoilage and contamination of finished product by micro-organisms e.g. Sodium benzoate, propyl gallate, potassium sorbate etc.

Natural Preservatives:

These are the chemical substances obtained from natural sources that offer intrinsic ability to protect products against microbial growth. These include essential oil constituents, flavonoids,

phenolic compounds etc. The natural preservatives are further classified into four types:

- Plant derived products as preservatives
- Animal derived products as preservatives
- Certain microbes and/or their metabolites

Based on mode of action, Natural preservatives are also classified into two groups:

Antimicrobial preservatives and Antioxidants:
Antimicrobial preservatives are included in the preparations to kill or to inhibit the growth of microorganisms during manufacture or use. Antimicrobial preservatives are further classified into two main subclasses:

Antifungal preservatives and Antibacterial preservatives:
Anti-fungal preservatives include compounds such as benzoic and ascorbic acids and their salts etc. whereas Antibacterial preservatives include compounds such as quaternary ammonium salts, alcohols, phenols etc. Antioxidants are included in the pharmaceutical products to prevent decomposition from oxidation. Antioxidants are classified into three sub-groups. The first one is known as true antioxidants, or antioxygen, probably inhibit oxidation by reacting with free radicals blocking the chain reaction. The second one consists of reducing agents; these substances have lower redox potentials than the drug or adjuvant which they are to be protected, and are therefore, more readily oxidized. Reducing agents may act also by reacting with free radicals. The third one consists of antioxidant synergists which usually have little antioxidant effect themselves but probably enhance the action of antioxidants in the first group by reacting with heavy metal ions which catalyze oxidation [3, 4].

Modes of action of preservatives:
Preservatives generally offer restricted protection against viral contamination. Bactericides and fungicides may substantiate their effects on a diversity of microbial cellular targets, for example; the cell wall, the cytoplasmic membrane or the cytoplasm. It is frequently intricate to assign a particular target for a specific class of preservative; the target can and does alter with preservative concentration. As a consequence, preservatives can often interfere with several different microbial cellular mechanisms (Table 2). Such cytotoxicity may also affect mammalian cells. Hence inclusion levels should be minimal, consistent with adequate preservation[5]. There is a regulatory expectation that the reason for preservative inclusion, proof of efficacy, safety information, control methods in finished product and details of labeling in the finished product should all be addressed by the applicant Mechanisms for activity at the locations listed in Table 2.

Preservatives from plant source:
Herbs have been used as preservatives due to their antimicrobial activity against certain pathogens and antioxidant property. Herbs and spices contain volatile chemicals that are used in the production of preservatives via distillation and enzymatic action. The aromatic constituents present in the plant exist as a precursor that gets decomposed by enzymes during plant tissue damage creating an anti- bacterial aroma. The list of preservatives obtained from Plant sources are given in Table-3 & Table-4 [6,7,8,9].

Preservatives from animal source:
Certain animal secretions or products produced outside or inside their body act as a source of preservation either in their crude form or after being processed to suitable form. The list of preservatives obtained from animal source is given in Table-5 [10,11,12].

Antimicrobial activity of onion:
(*Allium cepa,* L.) has traditionally been focused on the presence of thiosulfinates and other volatile organic compounds These molecules originate due to the action of the enzyme alliinase which is released when plant material is disrupted and transforms cysteine sulfoxide precursors into sulfenic acids and thiosulfinates [13]. Onion antiyeast and anti-fungal activity has been mainly attributed to the presence of organosulfur-containing compounds which inhibit the growth of yeast and fungi such as, *Candida albicans, Aspergillus niger*, *Penicillum cyclopium* or *Fusarium oxysporum*[14].

Flavonols quercetin and kaempferol are commonly present in notable amounts in onions and are the main non-volatile compounds responsible for their antimicrobial properties [15]. *In vitro* studies have reported that onion flavonoids can effectively inhibit the growth of gram positive bacteria associated to food spoilage, such as *Bacillus cereus*, *B. subtilis*, *Staphylococcus aureus*, *Microcroccus luteus and Listeria monocytogenes*, while the gram negative bacteria *Escherichia coli* and *Pseudomonas aeruginosa* seem to be more resistant [16].

Table 1: List of preservatives for pharmaceutical products

Medicinal product	Preservative	Chemical class
Parenterals	Benzyl alcohol, chlorbutanol, 2-ethoxyethanol	Alkyl/aryl alcohols
	Methyl, ethyl, propyl, butyl parabens and combinatios	Amino aryl acid esters
	Phenol, 3-cresol	phenols
Ophthalmic	Thiomersal, phenylmercurate salts	Organic mercurials
	Chlorhexidine, polyhexamethylbiguanide	buguanides
	Imidurea	Formaldehyde donators
Oral	Sodium benzoate, Benzoic acids	Aryl acids
	Sorbic acid, Potassium sorbate	Alkyl acids
	Methyl paraben/ Sodium benzoate combinations	Amino aryl acid esters
Topical including nasal	Chlorhexidine	Buguanides
	Thiomersal	Oraganic mercurials
	4-chlrocresol, Dichlrophene	Phenols

Table 2: Site of action in microbial cell by preservative

Cell wall	Cytoplasmic membrane	Cytoplasm
Chlorhexidine, cetrimide	Chlorhexidine, hexachlorophene	Chlorhexidine (high concentrations)
Phenols	2-phenoxyethanol	2-phenoxyethanol and other oraginc alcohols
EDTA	EDTA	**-----**
Glutaraldehyde	Formaldehyde donators, e.g. bronopol, imidurea	Formaldehyde donators, e.g. bronopol, imidurea
Aryl and alkyl acids	parabens	Aryl and alkyl acids

Table 3: List of herbs used as preservatives

Source	Chemical Constituents	Uses
Aframomum melegueta (Family:Zingiberaceae)	6-Paradol and 6-Shogaol	Antimicrobial, active against Mycobacterium chelonei [M.chelonae], M. intracellulare, M. smegmatis and M. xenopi.
Alpinia speciosa (Family: Boraginaceae)	Pentadecanoic acid, terpinen-4-ol, sabinene	Antibacterial, Antifungal, active against Gram-positive bacteria (Bacillus subtilis, Staphylococcus aureus, Sarcina lutea and Mycobacterium phlei) and Gram-negative bacteria (Escherichia coli and Pseudomonas aeruginosa), as well as Candida albicans.
Arnebia tinctoria (Family: Boraginaceae)	Two naphthoquinones, alkannin and isovalerylalkannin,	Antimicrobial, Antibacterial and Antifungal, active against Bacillus subtilis, Staphylococcus aureus, Streptomyces pyogenes and Candida albicans.
Artemisia selengensis and Artemisia stolonifera (Family: Compositae)	Beta-pinene and betacaryophyllene	Anti Fungal, active against Candida albicans, Rhodotorula rubra and Aspergillus fumigatus
Bixa orellana (Family: Bixaceae)	delta-tocotrienol	Antibacterial and Antifungal, active against Gram-positive bacteria including Bacillus subtilis, Staphylococcus aureus and Streptococcus faecalis, and exhibited slight activity against Escherichia coli, Serratia marcescens, Candida utilis and Aspergillus niger

Buddleja madagascariensis (Family: Scrophulariaceae)	Mimengoside - A	Protozoocidal, Antifungal, active against Candida strains, Trichomonas vaginalis and Leishmania infantum
Capsicum Species (Family : Solanaceae)	Capsaicin and dihydrocapsaicin	Antimicrobial, Antibacterial and Antifungal, active against bacterial species Bacillus cereus, B. subtilis, Clostridium sporogenes, Clostridium tetani,
Chamaecyparis obtuse (Family: Cupressaceae	Thujaplicin	Antibiotic, active against methicillin-resistant Staphylococcus aureus (MRSA) Escherichia coli, Mycobacterium chelonei [M. chelonae], Pseudomonas aeruginosa and Candida albicans.
Rhazya stricta (Family:Apocynaceae)	Strictanol, tetrahydrosecamine, akuammidine and rhazimanine	Anti Bacterial and Anti fungal, active against S.Aureus, E. Coli, C. Albicans
Parthenium argentatum (Family : Asteraceae) (Compositae)	Guayulins A and B, and argentatines A-D,	Antibacterial, active against Torulopsis glabrata, Hansenulla [Hansenula] sp., K. pneumoniae, and P. aeruginosa.
Ocimum gratissimum (Family:Lamiaceae)	Thymol	Antibacterial and Antifungal, active against Salmonella spp., Klebsiella pneumoniae, Proteus vulgaris, A. fumigatus
Nelumbo nucifera (Family :Anelumbonaceae)	Kaempferol 3-O-glucoside and luteolin 7-O-glucoside	Antibacterial, Anti-inflammatory, Analgesic and Anti Fungal activities
Lychnophora salicifolia (Family: Asteraceae)	Caryophyllene derivatives, lychnopholic acid and acetyl lychnopholic acid,	Antibacterial and Antifungal, active against C. tropicalis and Trichophyton rubrum,E. Coli, S. Aureus
Landolphia owrrience (Family:Apocynaceae)	Steroids, saponins, tannins	Antibacterial, Antifungal and Antimicroabial, active against E. coli, B. subtilis and C. albicans
Kigelia pinnata (Family: Bignoniaceae)	Naphthoquinones, isopinnatal, lapachol, phenylpropanoids, pcoumaric and ferulic acid	Antibacterial and Antifungal, active against Corynebacterium diphtheria, Pullularia pullularis
Garcinia kola (Family: Clusiaceae or Guttiferae)	Polyisoprenyl benzophenone (kolanone), hydroxybiflavanonols	Antibacterial and Antifungal active against E. coli, C. albicans, S.Aureus
Glehnia littoralis (Family: Apiaceae)	1,9-Heptadecadiene-4,6-diyne- 3,8,11-triol and (10E)1,10-heptadecadiene-4,6-diyne-3,8,9- triol	Antibacterial and Antifungal, active against P. aeruginosa, E. coli, S. aureus, B. subtilis and C. albicans.
Juniperus species (Family: Cupressaceae)	Alpha-terpineol (88.4%).	Antibacterial and Antifungal, active against P. aeruginosa, E. coli, B. subtilis and C. albicans

Table 4: List of essential oils used as preservatives

Name	Source	Chemical Constituents	Uses
Birch oil	Betula alba (Family:Betulaceae)	Betulin,betulinic acid and phytochemicals (polyphenols, salicylic acid)	Antioxidant, preservative, antibacterial
Cinnamon Oil	Cinnamomum zeylanicum (Family: Lauraceae)	Eugenol, eugenol acetate and cinnamic acid, cinnamic aldehyde	Antioxidant, antiviral
Clove Oil	Eugenia caryophylla (Family:Myrtaceae)	Eugenol, Iso eugenol, Eugenol acetate	Antioxidant, antiviral, anthelmentic, relieves toothache, hypoglycemic, antiherpes virus
Coriander	Coriandrum sativum (Family:Umbelliferae)	Terpenes, linalool and pinene	Antioxidant, antibacterial, anxiolytic, carminative, digestive aid
Eucalyptus Oil	Eucalyptus globulus (Family:Myrtaceae)	A-pinene, b-pinene, terpinen-4-ol, aromadendrene, epiglobulol,	Anti oxidant, a cooling and deodorizing effect on the body,
Fennel Oil	Foeniculum vulgare (Family:Umbelliferae)	A-pinene, myrcene, limonene, 1,8-cineole	Antioxidant, antiseptic, antispasmodic, carminative, depurative, diuretic
Lemon oil	Citrus limonum (Family:Rutaceae)	Ascorbic acid (vitamin c), aterpinene, linalool, bbisabolene,	Antioxidant, reducing blood pressure
Sage oil	Salvia officinalis (Family: Labiatae)	Chlorgenic acid, flavones, flavonoid glycoside,cineole, thujone	Anti oxidant, anti biotic, anti fungal, antispasmodic, astringent
Thyme Oil	Thymus vulgaris (Family: Labiatae)	Thymol, a-thujone, apinene, linalool	Antioxidant,antiseptic, antifungal
Marjoram Oil	Origanum marjorana (Family: Labiatae)	Sabinene, a-terpinene, linalool, cis-sabinene hydrate, l terpinen-4-ol	Anti oxidant, analgesic, antispasmodic, antiseptic, antiviral, bactericidal
Marjoram Oil	Origanum marjorana (Family: Labiatae)	Sabinene, a-terpinene, linalool, cis-sabinene hydrate, l terpinen-4-ol	Anti oxidant, analgesic, antispasmodic, antiseptic, antiviral, bactericidal
Oregano oil	Origanum vulgare (Family: Labiatae)	Phenolic acids and flavonoids	Antioxidant, antiviral, antibacterial
Cumin oil	Cuminum cyminum of (Family:Umbelliferae)	Pinene, phellandrene, Limonene	Antioxidant, antispasmodic, carminative, stimulant and tonic

Table 5: Preservatives from animal source

Name	Source	Uses
Chitosan	By Deacetylation of Chitin present in exoskeleton of Crustaceans(crabs, shrimps) and Cell wall of Fungi	Antimicrobial against Fungi, Algae, Bacteria and also as Natural Biopesticide
Defensin	Cystiene rich cationic compound found in both vertebrates and invertebrates and also in plants	Antimicrobial against Fungi, Algae, enveloped and non-enveloped viruses
Lactoferrin/ Lacto-transferrin	Found in Human Milk, Animal Milk (Cow milk), Saliva, Tears	Antibacterial, Antiviral, Antifungal, Anticancer and Body immunity
Lacto-peroxidase System	A Peroxidase enzyme secreted from mammary, salivary and other mucosal glands	Antibacterial, Antiviral, Antitumour (Breast Cancer), Preservative in Cosmetics
Lysozyme/Muramidase	Found in Human Milk, Animal Milk (Cow milk), Saliva, Tears, neutrophils and also egg white	Antibacterial (Gram positive bacteria) Immunity Booster
Pleurocidin	Isolated from the mucus membranes of winter flounder (Pseudopleuronectes americanus)	Antibacterial, Antifungal, Antiviral and Antiparasitic
Lard .	Purified internal fat obtained from the abdomen of hog Sus scrofa Linn	Preservative
Lacto-peroxidase System	A Peroxidase enzyme secreted from mammary, salivary and other mucosal glands	Antibacterial, Antiviral, Antitumour (Breast Cancer), Preservative in Cosmetics

Classification of food additives:

- Preservatives
  - ✓ Antimicrobials
  - ✓ Antibrowning
  - ✓ Antioxidants
- Coloring agents
  - ✓ Azo compounds
  - ✓ Xanthenes
  - ✓ Triarylmethane
  - ✓ Indigos
- Nutritional additives
- Flavoring agents
  - ✓ Sweetners
  - ✓ Flavor enhancers
  - ✓ Natural and synthetis flavors
- Texturizing agents
  - ✓ Emulsifiers
  - ✓ Stabilizers

Advantages of Food Additives and Preservatives [17]

- They allow our growing urban population to have a variety of foods year-round and, they make possible an array of foods without the inconvenience of daily shopping.
- Additives also improve the nutritional value of certain foods and can make them more appealing by improving their taste, texture, consistency or colour.
- The importance of preserving food is that, it lengthens the shelf life of a food and it slows down the spoilage of food which is caused by microorganisms present in the container or the hands that held it before putting it inside a container.
- The importance of food preservation is so that the food cannot be spoilt or can cause illness.

Additives are used in foods for five main reasons:

- To maintain product consistency
- To improve or maintain nutritional value
- To maintain palatability and wholesomeness
- To provide leavening or control acidity/alkalinity
- To enhance flavour or impact desired colour
- To maintain product consistency and quality

Disadvantages of Food Additives [18]

Although additives and preservatives are essential for food storage, they can give rise to certain health problems. They can cause different allergies and conditions such as hyperactivity

and Attention Deficit Disorder in some people who are sensitive to specific chemicals. The foods containing additives can cause asthma, hay fever and certain reactions such as rashes, vomiting, headache, tight chest, hives and worsening of eczema. Some of the known dangers of food additives and preservatives are as follows:

- Benzoates can trigger the allergies such as skin rashes and asthma as well as believed to be causing brain damage.
- Bromates destroy the nutrients in the foods. It can give rise to nausea and diarrhea.
- Butylates are responsible for high blood cholesterol levels as well as impaired liver and kidney function.
- Caffeine is a colorant and flavorant that has diuretic, stimulant properties. It can cause nervousness, heart palpitations and occasionally heart defects.
- Saccharin causes toxic reactions and allergic response, affecting skin, gastrointestinal tract and heart. It may also cause tumors and bladder cancer.
- Red Dye 40 is suspected to cause certain birth defects and possibly cancer.
- Mono and di-glycerides can cause birth defects, genetic changes and cancer.
- Caramel is a famous flavoring and coloring agent that can cause vitamin B6 deficiencies. It can cause certain genetic defects and even cancer.
- Sodium chloride can lead to high blood pressure, kidney failure, stroke and heart attack.

Classification of Food preservation [19]

Some preservation methods require the food to be sealed after treatment to thwart recontamination with microbes; others, such as drying, allow food to be stored without any special containment for +extended periods. Common methods of applying these processes include drying, spray drying, freeze drying, freezing, vacuum-packing, canning, preserving in syrup, sugar crystallization, food irradiation, and adding preservatives or inert gases such as carbon dioxide. Other methods that not only help to preserve food, but also add flavour, include pickling, salting, smoking, preserving in syrup or alcohol, sugar crystallization and curing.

Preservation processes include:

- Heating to kill or denature micro-organisms (e.g. boiling)
- Oxidation (e.g. use of sulfur dioxide)
- Toxic inhibition (e.g. smoking, use of carbon dioxide, vinegar, alcohol etc)
- Dehydration (drying)
- Osmotic inhibition (e.g. use of syrups)
- Low temperature inactivation (e.g. freezing)
- Ultra high water pressure (e.g. fresherised, a kind of "cold" pasteurization, the pressure kills naturally occurring pathogens, which cause food deterioration and affect food safety). These methods include

E-Numbering

To regulate these food additives, and inform consumers about the nature of the additives, each additive is assigned a unique number termed as "E numbers" which is used in Europe for all approved additives. E-numbers are all prefixed by "E" but countries outside Europe use only the number whether the additives is approved in Europe or not. For example, acetic acid is written as E260 on products sold in Europe, but is simply known as additives 260 in some other countries.

Additives 103, alkanet, is not approved for use in Europe so does not have an E number, although it is approved for use in Australia and New Zealand since 1987. Australia has had an approved system of labeling for additives in packaged foods. Each food additive has to be named or numbered. The numbers are the same as in Europe, but without the prefix 'E'. Some E number for some food additives are; Tartrazine (E102), Quinoline Yellow (E104), Carmosine (E122) and Amaranth (E123).

Applications

Preservatives are natural, artificial and microbial are used to maintain the shelf life and characteristics of various food items. Methods of preserving foods have been used for centuries and include natural techniques such as smoking fish and meat as well as adding salts. Refrigerating and freezing food items also falls under natural waysof preserving foods. Food preservatives can also enhance the appearance of food items as well as add nutritional value.

1. Economical: The olive fruit, its oil and the leaves of the olive tree have a myriad of medicinal and other uses. Primarily, olives are used for their oil or as table olives and are an important part of the Mediterranean diet. Because of their organoleptic characteristics,

olives require processing prior to consumption In both fruit and oil, the phenolics constitute a complex mixture, although there are some notable differences in composition between the two that are attributed to a series of chemical or enzymatic alterations of some phenols during oil extraction. These modifications include hydrolysis of glycosides by glucosidases oxidation of phenolic compounds by polyphenol oxidases and, the polymerization of free phenols [20- 22].

2. Cosmetics: Commonly, formulations contain parabens in concentrations up to 1%. Methyl paraben individually or with other parabens is used in all 13 product formulation categories. Products containing these ingredients may contact the skin, hair and scalp, lips, mucosa (oral, ocular and vaginal), axillae and nails. Products containing parabens may be used on an occasional or daily basis and their use may extend over a period of years. Frequency of application and duration of exposure may be continuous. Methyl paraben is the most used preservative in cosmetics. Concentrations of parabens are usually less than 0.3%, with the most common preservative system containing 0.3% methyl paraben and 0.1% propyl paraben but may range up to 1%. Parabens formulate well because they have no perceptible odor or taste, are practically neutral, do not produce discoloration, and do not cause hardening or muddying [23,24].

3. Food and food products: Types of food that may contain parabens include alcoholic beverages, frozen dairy products gelatins, grain products, jams, jellies, marmalades, mincemeat, olives, pickles, relishes, preserves, processed fruits and vegetables, tomato pulp, tomato puree, catsup, fruit juices, soft drinks, puddings, seasonings, soft candy, sugar substitutes, syrups and sweet sauces. Parabens are used in coffee extracts, fruit juices, pickles, sauces, soft drinks, processed vegetables, baked goods, seasonings, sugar substitutes and frozen dairy products at concentrations of between 450 and 2000 ppm [25,26].

4. Pharmaceutical applications: Use concentration varies from product to product but seldom exceeds 1%. Methyl paraben is used in injections (0.065–0.25%), ophthalmic preparations (0.015–0.05%), oral solutions and suspensions (0.015–0.2%), topical preparations (0.02–0.3%) and vaginal preparations (0.1–0.18%). The microbes may range from spoilage organisms to food pathogens such as E.coli, Salmonella spp., Campylobacter spp. and L. monocytogenes[27,28].

Classification of Estimation methods of food preservatives [29]

- Per-capita method
- Targeted surveys
- Food diary records
- Duplicate diet studies
- Total diet study
- Biomarker-based methods
- Dietary recall and food frequency

Analytical methods [30, 31]

- Spectrophotometric methods
- Gas chromatography
- HPLC
- Ion chromatography
- Fourier Transform Near-Infrared (FT-NIR)
- HPTLC-UV
- TLC
- Micellar electro kinetic capillary chromatography

CONCLUSION

Additives help to reassure the availability of wholesome, appetizing and affordable foods that meet consumer's demands from season to season. In summary, a food needs to be looked at in its totality-is it gluten free or not. The existence or nonexistence of additives in a specific food product can only be supplied by the food manufacturer. Additives have been used for many years to preserve, flavor, blend, thicken and color foods, and have played an significant and indispensable role in plummeting grave nutritional deficiencies. Food additives play a imperative role in the food industries, but the a variety of undesirable effects associated with them stay behind a problem that need to be fought by us. Synthetic food additives retort with the cellular component of the body leading to the an assortment of food disturbances. If we must use food additives, because of their advantages, they should be the natural ones which have minimal effects and those that are generally recognized as safe (GRAS) and in the case of those not generally recognized as safe (Non GRAS), the acceptable daily intakes (ADIs) should not be exceeded. To diminish the jeopardy of rising health troubles due to food additives and preservatives, one should avoid the foods containing these additives and preservatives.

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