Newsletter on Eco-labelling and Eco-friendly Products

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Food Additives

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Foreword

To preserve flavour or enhance the taste and appearance of the food, we use food additives. When we add food additives during processing or production of the food, these become a part of any food product. Different kinds of additives have been developed, both natural and artificial, in the second half of the 20th century to enhance the quality of food.

Food additives maintain product consistency, improve or preserve the nutrient value, maintain the wholesomeness of foods, control the acidity or alkalinity, provide leavening, colour and enhance flavour. To produce a desired effect, intentional or direct food additives are added. It maintains freshness, improves nutritional quality, and makes food more appealing.

The U.S. Food and Drug Administration (FDA) has listed safe food additives. The scientific community has recognized many food additives as safe without undergoing any testing. These food additives are put on the generally recognized as safe (GRAS) list. The list consists approximately of 700 items. Examples of some of the items on this list are: guar gum, sugar, salt, and vinegar. The list is evaluated on an on-going basis. Manufacturers have to take approval from FDA before marketing a new food- or colour- additive. FDA has the main legal responsibility for determining the safety of these additives. Federal authorities and various international organizations carefully regulate to ensure that foods are safe to eat and are accurately labelled. These additives are strictly studied, regulated, and monitored.

In India "Food Safety and Standards Authority of India" plays an important role in the identification and listing of additives which are evaluated by "the joint FAO/WHO Expert Committee on Food Additives" (JEFCA). No additives are added to any food product other than those provided in the Food Safety and Standards Act or otherwise specifically provided under any other regulations under the Act.

We, as consumers, are concerned about these additives because the unfamiliar names indicate complex chemical compounds. Every food we eat - whether raw or cooked food – is made up of chemical compounds. These chemical compounds determine colour, texture, flavour, and nutrient value. We can avoid the use of additives if we grow our own food, harvest, and spend hours in cooking and canning or accept the increased risk of food spoilage. Today most consumers have faith in the many technological, aesthetic, and convenient benefits that additives provide in food. They demand and enjoy flavoured, safe, nutritious, and affordable foods.

The purpose of this ENVIS issue is to provide helpful background information about food additives, why they are used in foods and how regulations govern their safe use in food supply.

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Food Additives

Food additives are substances added to food to preserve flavour or improve its taste and appearance. Some additives have been used for centuries, for example, preserving food by pickling (with vinegar), salting, as with bacon, preserving sweets or using sulfur dioxide as in some wines. With the advent of processed foods in the second half of the 20th century, many more additives have been introduced, of both natural and artificial origin.

A food additive may be defined as any substance or a mixture of substances other than the basic foodstuff which is present in food as a result of any aspect of production, processing, storage or packaging. Food additives are added intentionally to foods and are not naturally a part of the food.

Different countries have different laws pertaining to which food additives can be used and in which foods e.g. Food Safety and Standard (FSS) Act and Rules in India. These laws specify the amounts and names of food additives which can be added to certain foods.

Functions of Food Additives

- Maintaining product consistency;
- Improving or maintaining nutritive value;
- Maintaining palatability and wholesomeness;
- Improving flavour or imparting desired colour;
- Providing leavening or controlling acidity/alkalinity.

Classification of Food Additives

Food additives are classified based on their function in food i.e., the purpose for which the additive has been added to the food.

The various classes of food additives include:

- Antioxidants;
- Preservatives;
- Food Colours;
- Food Flavours;
- Emulsifiers and stabilizers;
- Artificial sweeteners;
- Miscellaneous: Anti-caking agents; sequesterants; acids, bases, and buffers; anti foaming agents, enzymes, leavening agents.

Broadly speaking, these food additives can be classified as:

- Direct food additives
- Indirect food additives

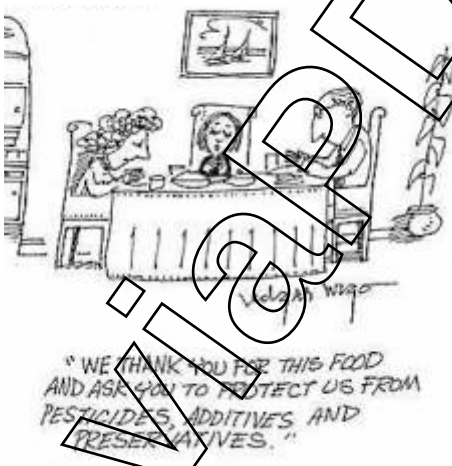
Direct food additives are added to a food for a specific purpose in that food e.g. synthetic colour. Indirect food additives become part of the food in trace amounts due to packaging, storage or other handling. Additives used in raw ingredients or any other material with which foods may come in contact may find their way into the finished food product. Antioxidants, for example, used in edible oil may be found in chips or any food item prepared with this oil. This is known as the "carry over" principle.

Safety Issues

- A large number of substances in use today as food additives are "generally recognized as safe" or GRAS substances. GRAS substances are those whose use is generally recognized by experts as safe, based on their extensive history of use in food or based on published scientific evidence. Salt,

sugar, spices, vitamins are classified as GRAS substances.

- Although most food additives are considered to be without any potential adverse effects, there have been problems concerning the safety of some of these chemicals.
- The safety of the antioxidant BHA has been questioned in the light of the fact that its consumption leads to cancer in rodents.
- Sensitive asthmatics have been reported to develop allergic responses to the food colour tartrazine. Allergies have been reported to cause even fatal shock. Nitrites can form cancer-causing nitrosamines in foods in which they are added as preservatives.
- MSG intake of 1.5g or more can result in acute illness characterized by burning tingling sensation on face, neck and head, tightness, stiffness or pressure in chest and facial muscles. This is the "Chinese Restaurant Syndrome" because these symptoms have been seen in people who had consumed Chinese food.



- High levels of erythrosine intake have been associated with thyroid tumors.
- Ponceau 4R, Tartrazine and Sunset Yellow FCF have provoked allergic reactions in several individuals even at low levels of intake. The allergic responses vary rashes to swelling and worsening of the condition of patients with asthma.
- One should choose foods that are free of additives or at least select those brands of processed foods which have a minimum number of additives. Foods with artificial or synthetic clolours and Class II preservatives should be avoided. The label of the food product declares the presence of the additives used in the product. Hence only properly labelled foods should be selected.
- With the increasing use of processed foods since the 19th century, there has been a great increase in the use of food additives of varying levels of safety. This has led to legislation in many countries regulating their use.
- For example, boric acid widely used as a food preservative from the 1870s to the 1920s, but was banned after World War I due to its toxicity, as demonstrated in animal and human studies. During World War II the urgent need for cheap, available food preservatives led to it being used again, but it was finally banned in the 1950s. Such cases led to a general mistrust of food additives, and an application of the precautionary principle led to the conclusion that only additives that are known to be safe should be used in foods.
- In the USA, this led to the adoption of the Delaney clause, an amendment to the Federal Food, Drug, and Cosmetics Act (FFDCA) an amendment to the substances may be used as food additives. However, after the banning of cyclamates in the USA and Britain in 1969, saccharin, the only remaining legal artificial sweetener at the time, was found to cause cancer in rats.
- There has been significant controversy associated with the risks and benefits of food additives. Some artificial food additives have been linked with cancer, digestive problems, neurological conditions in addition to ADHD, and diseases like heart disease or obesity.
- Even "natural" additives may be harmful in certain quantities (table salt, for example) or because of allergic reactions in certain individuals. Safrole was used to flavour root beer until it was shown to be carcinogenic. Due to the application of the Delaney clause, it may not be added to foods, even though it occurs naturally in sassafras and sweet basil.

Standardisation of its derived products

ISO has published a series of standards regarding the topic and these standards are covered by ICS 67.220.

Ref: Training manual for Food Safety regulators 2010

ECOMARK CRITERIA FOR FOOD ADDITIVES

(The Gazette of India, Extraordinary, Part II-Section 3(i), No. 170, May 18, 1996)

GENERAL REQUIREMENTS :

- All the food additives mentioned below shall meet the relevant standards of BIS.

S. No	Items
1.	**Acetic Acid Glacial**
2.	**Vinegar**
3.	**Sodium benzoate**
4.	**Citric acid**
5.	**Sodium metabisulphite**
6.	**Potassium metabisulphite**
7.	**Sodium bicarbonate & Sodium Carbonate**
8.	**Natural Colourants : Caramel**
9.	**Baking Powder.**

- The product manufacturer must produce the consent clearance, as per the provisions of Water (Prevention and Control of Pollution) Act 1974, Water (Prevention and Control of Pollution) Cess Act 1977 and Air (Pollution and Control of Pollution) Act 1981 along with the authorisation if required under Environment (Protection) Act 1986 and rules made thereunder to Bureau of Indian Standards while applying for the ECOMARK and the product shall also be in accordance with the Prevention of Food Adulteration Act 1954 and the rules made thereunder.
- The product packaging may display in brief the criteria based on which the product has been labelled Environment Friendly.
- The material used for product packaging shall be recyclable or biodegradable
- The date of manufacture and date of expiry shall be declared on the product package by the manufacturer.

The product package or leaflet accompanying it may display instructions of proper use and storage so as to maximise the product performance, safety and minimise wastage.

PRODUCT SPECIFIC REQUIREMENTS:

ACETIC ACID, GLACIAL: It shall conform with the following standards: Assay : Not less than 99.5 percent, by weight, of $C_2H_4O_2$; Arsenic : Not more than 1.5 ppm; Heavy Metals (as Pb) : Not more than 10 ppm; Non-volatile Residue : Not more than 0.005 percent.

VINEGAR : Vinegar shall conform with the following standards: It shall contain at least 3.75 grammes of acetic acid per 100 ml; It shall contain at least 1.5 percent w/v of total solids 0.18 percent of ash; It shall not contain

(i) any mineral acid
(ii) lead and copper
(iii) arsenic in amounts exceeding 1.5 parts per million, and
(iv) any foreign substances of colouring matter except caramel.

Malt vinegar, in addition, shall have atleast 0.05 percent of phosphorus pentoxide (P_2O_5) and 0.04 percent of nitrogen.

Note: Brewed vinegar shall not be fortified with acetic acid.

SODIUM BENZOATE : It shall conform with the following standards: Assay : Not less than 99.5 percent of C2H 5 NaO2 calculated on the dry basis; Arsenic : Not more than 1.5 ppm ; Heavy Metals (as Pb) : Not more than 10 ppm. ; Moisture : Not more than 1.5 percent

CITRIC ACID : It shall conform with the following standards: Assay : Minimum 99.5 percent by weight of Citric Acid.; Water Insoluble matter : Not more than 30 ppm.; Sulphated ash : Not more than 100 ppm.; Chloride (as Cl) : Not more than 5 ppm.; Phosphate (as P2O5) : Not more than 5 ppm.; Calcium : Not more than 25 ppm.; Heavy metals (as Pb) : Not more than 10 ppm.; Tridodecyclamine : Not more than 0.1 ppm

SODIUM METABISULPHITE : It shall conform with the following standards: Assay : Not less than 95.0 percent by weight of Na2S2O5. ; Arsenic : Not more than 1.5 ppm. ; Heavy Metals (as Pb) : Not more than 10 ppm. ; Iron : Not more than 5 ppm.; Selenium : Not more than 10 ppm.

POTASSIUM METABISULPHITE : It shall conform with the following standards : Assay : Not less than 95.0 percent by weight of $K_2S_2O_5$; Arsenic : Not more than 1.5 ppm; Heavy Metals (as Pb) : Not more than 10 ppm. Iron : Not more than 5 ppm. ; Selenium : Not more than 10 ppm.

SODIUM BICARBONATE : It shall conform with the following standards: Assay : Not less than 99 percent by weight $NaHCO_3$; Ammonium Compound as NH_4 : Nil; Arsenic : Not more than 1.5 ppm. ; Heavy Metals (as Pb) : Not more than 10 ppm ; Natural Colorants : Caramel

BAKING POWDER : The product shall comply with the relevant Indian Standards and with the General Requirements prescribed under Clause - 1 for consideration of Ecomark.

Caramel Colours : These shall conform to IS 4467:1994 with the following additional standards Caramel Colour (Plain & Caustic Sulphate) (i) Sulphur dioxide : 0.1 percent (ii) 4-Mehtylimidazole : Not detectable using TLC method sensitive to 25 ppm + 20 percent

Caramel Colour (Ammonia & Ammonia Sulphite) (i) Sulphur dioxide : 0.1 percent. (ii) 4-Methylimidazole : 200 percent.

The product shall comply with the relevant Indian Standards and with the General Requirements prescribed under Clause - 1 for consideration of Ecomark.

Note: The limit of Heavy Metals (as Pb) given in clauses 2.1(c), 2.3(c), 2.4(g), 2.5(c), 2.6(c) and 2.7(d) includes nine metals namely : Ag, As, Bi, Cd, Cu, Hg, Pb, Sb and Sn when tested as per method given in Food Chemical Codex : 1981, III Edition, Method No. II on page No. 512-513.

The incorporation of the Ecomark requirements, in the following BIS standards, are under process :

1.	IS 695:1980	Acetic acid
2.	IS 1159:1981	Baking powder
3.	IS 2124:1974	Sodium bicarbonate
4.	IS 4447:1965	Sodium benzoate
5.	IS 4751:1994	Potassium metabisulphite (food grade)
6.	IS 4752:1994	Sodium metabisulphite (food grade)
7.	IS 5404:1984	Citric acid
8.	Standard Under Preparation	Vinegar

Functional Role of Additives

Additives are found in varying quantities in foods as ingredients, and function synergistically with other additives.

Food Additives are tested according to their roles.

Antioxidants
Chemical additive which when added to food retards or prevents oxidative deterioration of food e.g. lecithin, ascorbic acid, tocopherol. Butylated hydroxyanisole (BHA) can be added to ghee, butter, fat spread only.

Preservatives
Substances added to food to retard, inhibit or arrest the activity of microorganisms. Class I preservative can be used without restriction e.g. salt, sugar, spices, vinegar. Class II preservative use is restricted to only certain foods and the amount of the preservative which can be added to these foods is also specified under Food Safety and Standard (FSS) rules. The presence of a class II preservative has to be declared on the packaging/label e.g. sulphites, nitrates and nitrites, bezoic acid and sorbic acid.

Food colours
Substances used to correct loss of colour due to food processing or to correct natural variations in food colour. Use of colour is restricted to only specific items of food. Caramel can be used without label declaration. Other natural colours must be declared e.g. beta carotene, chlorophyll, riboflavin, annatto, saffron, curcumin or turmeric. Synthetic food colours permitted for use in India include: Ponceau 4R, Carmoisine, Erythrosine (Red); Tartrazine, Sunset Yellow FCF (Yellow); Indigo Carmine, Brilliant Blue FCF (Blue); Fast Green FCF (Green). Synthetic food colours are permitted only in certain foods such as ice cream, biscuits, cakes, canned peas and fruit squashes.

Flavouring agents
Add flavour or correct losses in flavour. Natural flavours are those exclusively obtained by physical processes from vegetables, sometimes animal raw

materials. Nature identical flavouring substances are chemically isolated from raw materials or obtain synthetically. They are chemically identical to the substances present in natural products. Artificial flavouring substances are those which have not been identified in natural product and are chemically synthesized. Monosodium glutamate (MSG) is permitted in restricted amounts and its addition needs to be declared on the label with a warning that the food is un-suitable for children below 12 months of age.

Addition of any extraneous flavouring of a food has to be declared on the label.

Emulsifying and stabilizing agents
Substances capable of facilitating a uniform dispersion of oils and fats in aqueous media or vice versa and or stabilizing such emulsions. No emulsifying or stabilizing agent can be used in any food except where use of emulsifying or stabilizing agent is specially permitted under FSS rules. Commonly used emulsifying or stabilizing agent include agar, alginates, dextrin, sorbitol, pectin, cellulose, mono glycerides or diglycerides of fatty acids.

Modified starches are being used by the food processing industry as thickeners.

Binders and stabilizers
These starches make sauces thick, potato chips crisp, pudding smooth in texture.

Edible gums are used as thickening agent in jams, gravies and sauces, jellying agent in pudding desserts: encapsulating agent to stabilize flavours.

Sweetening agents
Include calorie sweeteners, low-calorie sweeteners and non calorie sweeteners (which contain little or no calories). Calorie sweeteners contribute 4 kcal per gram and have been associated with dental problems like caries and gum disorders (e.g. cane sugar, glucose syrup, jiggery, honey, dextrose and invert sugar). Low calorie sweeteners are relatively less sweet than sucrose (sugar) and provide energy between 1 and 3 kcal per gram (e.g sugar alcohols or polyols). They occur naturally but are often manufactured on a commercial scale. Use of polyols not only aids diet control by reducing calorie intake, they also do not cause dental caries. Non-calorie sweeteners may be natural or synthetic. Synthetic high intensity sweeteners are more popular as they are very sweet., so needed in very small quantities e.g. saccharin, aspartame, acesulfame, potassium. Acesulfame can be used in cooking. Phenylketonuria patients must not consume aspartame. Sucralose is derived from ordinary sugar, is not broken down by the body and is poorly absorbed. It is 600 times sweetner than sugar.

Anti-caking agents
Anti-caking agents are anhydrous substances that can pick up moisture without themselves becoming wet and these are added to products such as table salt and dry mixes. "Free flowing" salt has anti-caking agents added to prevent formation of lumps. Anti-caking agents permitted in India include carbonates of calcium, magnesium; silicates, myristates, palmitates or stearates. In addition, calcium, potassium or sodium ferrocyanide may also be used as anti-caking agents in common salt, iodized salt and iron-fortified salt.

Sequesterants
Substances that form a complex with transition metal ions like copper, iron, cobalt and nickel. These metals are powerful catalysts in the auto-oxidation processes and their binding helps in eliminating / retarding the oxidative breakdown of foods which would otherwise result in decolourisation, rancidity and production of an off taste. Examples are citric acid, phosphoric acid, tartaric acid and ethylene diamine tetra acetate (EDTA).

Buffering agents (Acids, bases, salts)
Buffering agents are materials used to counter acidic and alkaline changes during storage or processing of food, thus improving flavour and increasing stability of foods. Examples are acetic acid, calcium oxide, ammonium phosphate monobasic, ammonium carbonate (bread improver in flour), citric acid, malic acid, DL lactic acid and L (+) tartaric acid (acidulants).

Anti-foaming agents
Reduce foaming on heating, slow down deteriorative changes e.g. dimethyl polysiloxane in edible oils and fats for deep-fat frying.

Enzymes
Mainly used in industry to split carbohydrates, proteins, lipids, used in cheese, bread production and tenderizing meat.

Leavening agents
Introduction of gas in batter or dough leading to its expansion, improves appearance, texture and taste of foods. With yeast, the fermentation process was slightly difficult to control and at times could lead to undesirable flavours. Chemical leavening agents like baking soda (sodium bicarbonate) do not have this problem. The vast majority of chemical leavening systems are based on reaction of an acid with sodium bicarbonate to release carbon dioxide. There are a number of acids which might be used and they differ in the speed at which they release the leavening gas e.g. cream of tartar (rapid release), sodium aluminium phosphate or sulphate (Slow release) anhydrous monocalcium phosphate (for an intermediate speed of release).

The food additives classification, as per Codex Alimentarius

Functional classes (for Labelling purposes)	Definition	Sub-classes (Technological functions)
1. Acid	Increases the acidity and /or imparts a sour taste to a food	Acidifier
2. Acidity Regulator	Alters or controls the acidity or alkalinity of a food	Acid, alkali, base, buffer, buffering agent, pH adjusting agent
3. Anti-caking agent	Reduces the tendency of particles of food to adhere to one another.	Anticaking agent, antistick agent, drying agent dusting powder, release agent
4. Antifoaming agent	Prevents or reduces foaming antioxidant, antioxidant synergist.	Antifoaming agent
5. Antioxidant	Prolongs the shelf-life of foods by protecting against deterioration caused by oxidation, such as fat rancidity and colour changes.	Antioxidant, antioxidant synergist, sequestrant
6. Bulking agent	A substance, other than air or water, which contributes to the bulk of a food without contributing significantly to its available energy value	Bulking agent, filler
7. Colour	Adds or restores colour in a food	Colour
8. Colour retention agent	Stabilizes, retains or intensifies the colour of a food	Colour fixative, colour stabilizer
9. Emulsifier	Forms or maintains a uniform mixture of two or more immiscible phases such surface as oil and water in a food	Emulsifier, plasticizer, dispersing agent, surface active agent, surfactant, wetting agent
10. Emulsifying salt	Rearranges cheese proteins in the manufacture of processed cheese, in order to prevent fat separation	Melding salt, sequestrant
11. Firming agent	Makes or keeps tissues of fruit or vegetables firm and crisp, or interacts with gelling agents to produce or strengthen a gel	Firming agent
12. Flavour enhancer	Enhances the existing taste and /or odour of a food	Flavour enhancer, flavour modifier, tenderizer
13. Flour treatment agent	A substance added to flour to improve its baking quality or colour	Bleaching agent, dough improver, flour improver

Colour Additives

Colour is an important property of foods that adds to our enjoyment of eating. Nature teaches us early to expect certain colours in certain foods, and our future acceptance of foods is highly dependent on meeting these expectations.

A Colour additive is any dye, pigment or substance that can impart colour when added or applied to a food, drug or cosmetic, or to the human body. Colour additives may be used in foods, drugs, cosmetics and certain medical devices such as contact lenses.

Colour variation in foods throughout the seasons and the effects of food processing and storage often require that manufacturers add colour to certain foods to meet consumer expectations. The primary reasons for adding colours to foods include:

- To offset colour loss due to exposure to light, air extremes of temperature, moisture and storage conditions.
- To correct natural variations in colour. Off-coloured foods are often incorrectly associated with inferior quality. For example, some tree-ripened oranges are often sprayed with Citrus Red No.2 to correct the natural orangy-brown or mattled green colour of their peels. (Masking inferior quality, however, is an unacceptable use of colours.)
- To enhance colours that occur naturally but of levels weaker than those usually associated with a given food.
- To provide a colourful identity to foods that would otherwise be virtually colourless. Red colours provide a pleasant identity to strawberry ice cream while lime sherbet is known by its bright green colour.
- To provide a colourful appearance to certain “fun foods”. Many candies and holiday treats are coloured to create a festive appearance.
- To protect flavors and vitamins that may be affected by sunlight during storage.
- To provide an appealing variety of whole-some and nutritious food that meet consumers' demands.

If the product exhibits an adequate colour by itself, there is no need to add extra colour. Thus chocolate products which have a rich natural brown much more fastidious to tastes than bright colours; excess of glaring colour is repellant, rather than attractive.

When colours are used for eye appeal and decoration, it is important to use bright, clean colours which are not too strong, Lemon, orange, pink, coffee and chocolate shades are acceptable and popular. Green, blue and popular shades would be used with caution except when employed with a specific and associated flavour.

There are several requirements which a colour must fulfill before it is acceptable for use in any food products. Any added colouring must conform to laws and regulations. First and foremost, they must be harmless. Secondly, they must be always free from flavour and odour. Thirdly, they must be soluble in water and should not be affected by the action of acids, alkalis, sulphur dioxide, high temperature and lights.

Before use, all colours are tested under long storage conditions in the products for which they are intended. Great care is needed when using dyes in confectionery, the greatest danger being on too liberal a use. Colours should be merely suggestive. Glaringly coloured confectionery goods have a repelling effect, but lack of colour on the other hand makes them appear insipid.

There are two classes of colours available for use in confectionery: natural and artificial. The natural colours are obtained from vegetable or animal sources. While artificial colours are derived from aniline dyes obtained from coal tar.

Most natural pigments can be classified into anthocyanins, betanins, carotenoids and chlorophylls. Some have been recognized as promising acceptable replacements for synthetic colours. The colour which occurs in greatest abundance in nature and one which we frequently wish to reproduce is green. We are all familiar with the rich colour given to toffees and caramels by the use of brown sugars in varying proportions. Sometimes to produce a really dark and appetizing colour the sugar is grilled or partially caramelized as a preliminary process. Caramel colour is produced by carefully controlled burning of either glucose or sucrose.

Considerable skill and experience are necessary in burning the sugar to assure a caramel which will be of standard strength, entirely soluble and give a stable solution. On heating, the sugar first melts, and when the temperature reaches about 312^0F the liquid shows a pale amber tint which rapidly deepens to brown and finally almost to black accompanied by acid fumers.

Colour in powder form varies in solubility. If the whole of the colour is not dissolved in the batch, specks may be observed in the final product. If it is considered convenient to prepare colours in liquid form ready for use then it is advisable to dissolve not more than 10 gms of colour in 500 c.c. of boiling water. The resulting solution should be filtered through a bag or other suitable medium into bottles which have been sterilized.

Natural colouring matters which may be used

The following natural colouring principles whether isolated from natural or produced synthetically may be used in or upon any article of food.

a) Beta-carotene
b) Beta-apo 8' carotenal
c) Methylester of Beta-apo-8' carotenoic acid
d) Ethylester of Beta-apo-8' carotenoic acid
e) Canthaxanthin
f) Chlorophyll
g) Caramel
h) Curcumin or Turmeric
i) Riboflavin (Lactoflavin)
j) Annatto
k) Saffron

Synthetic food colours which may be used:

No synthetic food colours or a mixture thereof except the following, shall be used in food.

	Colour	Common Name	Colour Index (1956)	Chemical Class
1.	Red	Ponceau 4R	16255	Azo
		Carmoisine	14720	Azo
		Erythrosine	45430	Xanthene
2.	Yellow	Tartrazine	19140	Pyrazolone
		Sunset Yello FCF	15985	Azo
3.	Blue	Indigo Carmine	73015	Indigoid
		Brilliant Blue FCF	42090	Triarylmethane
4.	Green	Fast Green FCF	42053	Triarylmethane

Additives	Where Used	Potential Problems
E102 Tartrazine	Sweets, Biscuits	Hyperactivity, Asthma, rashes
E124 Ponceau 4R	Sweets, Biscuits, Drinks, Custard powder, jelly crystal, ice-candy, thread candies, wafers	Allergy, intolerance
E110 Sunset Yellow	Sweets, Drinks, Ice-cream	Gastric upset, allergy
E122 Carmoisine	Biscuits, jelly, sweets, ready meals	Allergy, intolerance
E104 Quinoline Yellow	Sweets, pickles	Hyperactivity, Asthma, rashes rashes
E129 Allura Red AC	Soft drinks, cocktail, sausages	Some evidence of hyperactivity
E211 Sodium Benzoate	Soft drinks, baked goods, lollies	Hyperactivity, Asthma

Source: The proof food additives are as bad as we feared by Sean Poulter in the WWW.dailymail.co.uk

CAFFEINE QUICK FACTS:

- Caffeine is a naturally occurring substance found in the leaves, seeds or fruits of more than 60 plants.
- Coffee and cocoa beans, kola nuts and tea leaves are used to make beverages such as coffee, tea, cola drinks, and chocolate.
- Caffeine is used as a flavor in a variety of beverages.
- Caffeine will not help "sober up" someone who has consumed too much alcohol.

WHAT PRODUCTS CONTAIN CAFFEINE AND HOW MUCH?

	Milligrams of Caffeine	
Item	Typical	Range
Coffee (8-oz. cup)		
Brewed, drip method	100	60-180
Instant	65	30-120
Decaffeinated	3	1-5
Teas (8-oz. cup)		
Brewed, major U.S. brands	40	20-90
Brewed, imported brands	60	25-110
Instant	28	24-31
Iced (8-oz. glass)	25	9-50
Some soft drinks (8 oz.)	24	20-40
Cocoa beverage (8 oz.)	6	3-32
Chocolate milk beverage (8 oz.)	5	2-7
Milk chocolate (1 oz.)	6	1-15
Dark chocolate, semi-sweet (1 oz.)	20	5-35
Baker's chocolate (1 oz.)	26	26
Chocolate-flavored syrup (1 oz.)	4	4

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