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COLOURING AGENTS USED IN FOOD PRODUCTS

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Abstract

Food colourants have been much important in food product manufacturing. Food and color additives are strictly studied, regulated and monitored. Federal regulations require evidence that each substance is safe at its intended level of use before it may be added to foods. Furthermore, all additives are subject to ongoing safety review as scientific understanding and methods of testing continue to improve. A color additive is any dye, pigment or substance which when added or applied to a food, drug or cosmetic, or to the human body, is capable (alone or through reactions with other substances) of imparting color. FDA is responsible for regulating all color additives to ensure that foods containing color additives are safe to eat, contain only approved ingredients and are accurately labeled. Certified colors are synthetically produced (or human made) and used widely because they impart an intense, uniform color, are less expensive, and blend more easily to create a variety of hues. Color is added to food for one or more of the following reasons:

(1) to replace color lost during processing,
(2) to enhance color already present,
(3) to minimize batch-tobatch variations, and
(4) to color otherwise uncolored food.

Introduction

A colouring is any substance that is added to change formulation colour. One of the most obvious ways to influence the way a product looks is to add colouring agents. These range from "natural" and artificial colours to washes that enhance browning. Food colours fall into two main categories: artificial and natural, respectively. From a regulatory standpoint, natural colours cannot legally be termed natural colours on a food label unless they are used to colour the same type of product. For example, beet juice is really only a natural colour if it is used to colour beets. If it colours cherry juice, it is technically considered to be artificially coloured and the beet juice is deemed a colour additive.

Colourings

A growing number of natural food colourings are being commercially produced, partly due to consumer concerns surrounding synthetic colourings. Some examples include:

- Caramel colouring, made from caramelized sugar, used in cola products and also in cosmetics.
- Annatto, a reddish-orange dye made from the seed of the Achiote.
- A green dye made from chlorella algae.
- Cochineal, a red dye derived from the cochineal insect, Dactylopius coccus.
- Betanin extracted from beets.
- Turmeric
- Saffron
- Paprika
- Elderberry

To ensure reproducibility, the coloured components of these substances are often provided in highly purified form, and for increased stability and convenience, they can be formulated in suitable carrier materials (solid and liquid).

Artificial colouring

The colours below are known as "Primary Colours", when they are mixed to produce other colours, those colours are then known as "Secondary Colours".

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*Brilliant Blue, E133 (Blue shade)
* Indigotine, E132 (Dark Blue shade)
* Fast Green, E143 (Bluish green shade)
* Allura Red AC, E129 (Red shade)
* Erythrosine, E127 (Pink shade)
* Tartrazine, E102 (Yellow shade)
* Sunset Yellow, E110 (Orange shade)

Ads by Google Colour Agent Color Food Dye Edible Pigment

Dyes and Lakes

Colour additives are available for use in food as either "dyes" or "lakes".
Dyes dissolve in water, but are not soluble in oil. Dyes are manufactured as powders, granules, liquids or other special purpose forms. They can be used in beverages, dry mixes, baked Goods, confectionry, dairy products, pet foods and a variety of other products.
Lakes are the combination of dyes and insoluble material. Lakes tint by dispersion. Lakes are not oil soluble, but are oil dispersible. Lakes are more stable than dyes and are ideal for colouring products containing fats and oils or items lacking sufficient moisture to dissolve dyes. Typical uses include coated tablets, cake and donut mixes, hard candies and chewing gum.

Artificial colours consist of water soluble synthetic dyes or the aluminum salts of these dyes, called "Lakes." These seven synthetic dyes and their salts are deemed acceptable by most Food authorities for use in food. Blending the seven produces a wide spectrum of colour, including purple, black, brown, and variations of the primary colours.

Dyes display colours when dissolved in the aqueous phase of a food product. However, their solubility varies with temperature and often with the solute. Although at typical usage levels this will not ordinarily affect the finished product, it could make a difference when colour solutions are prepared. If the temperature of the solute changes, all the dye may not be in solution, and this could affect the colour of the finished product.

The Lakes are insoluble in most solvents and instead colour by dispersion. They are used in low moisture, often high-fat applications, but are not fat soluble. They may bleed color slightly in water, but in most applications they minimize colour bleed into adjoining areas. The shades produced depend on the method of production and to some extent on particle size. Lakes are more resistant than dyes to fading when exposed to high heat and light.Dyes go into solution and function on a molecular level. Lakes are different because the particles are dispersed. Particle size, particle shape and how well the particles are dispersed in the finished product all influence the outcome. In some cases, simply increasing the shear during dispersion may intensify the colour.

ARTIFICIAL COLOURANTS-

Colouring agent	description	Colour	odour	Stability to light	oxidation	pH	density	Solubilit
Erythrosine	Solid,fine powder	Red	Odorless	Poor	Fair	8-10	0.80	Propylen glycol>water>glycer
Sunset Yellow	Solid,fine powder	Reddish Orange	Odorless	Good	Fair	6-8	0.80	Glycerine>water> glycol>alco
tartrazine	Solid,fine powder	Light orange	Odorless	Good	Fair	6-8	0.70	Glycerine>water> glycol>alco
Ponceau	Solid,fine powder	Red	Odorless	Good	Fair	6-8	0.80	Water>propy glycol>glycerine TOP
Allura red	Solid,fine powder	Deep red	Odorless	Very Good	Fair	6-8	0.80	Water>glycerine> glycol>alco

amaranth	Solid,fine powder	Rediish brown	Odorless	Good	Poor	6-8	0.80	Water=glyceine>p glycol>alco
Indigo carmine	Solid,fine powder	Bluish brown	Odorless	Very poor	poor	6-7	0.80	Water>glycerine> glycol>alco
Brilliant blue	Solid,fine powder	Bluish violet	Odorless	Good	poor	6-7	0.80	Propyleneglycol>water>g
Quinoline yellow	Obtained from coal tar	Yellow to orange powder	Tar like odor	Fair	Forms quinolinic acid	8-9	0.20-0.70	water>glycerol>metl

NATURAL COLOURANTS-

Colouring agent	Description	Colour	Odour	Stability to light	Oxidation	pH	Density	Solubility
Paprika	Clear dark red oily liquid,	Dark red	Odorless	stable	poor	4.6	0.935-0.945	Soluble in fats ar
Annatto	Crystalline powder	Bright Yellow To Orange red	Peculiar odour	Fades in Strong& Direct light	Degrades By oxidation	5.5	0.6	Soluble in alcohol, e
Caramel	Thick liquid	Dark brown	Pleasent	stable	stable	2-10	0.6-0.7	Soluble in water , alcohol. Insoluble in benz chloroform, etl
Carotene	Powder, crystals	Red to Brown		stable	stable	2-14		Soluble in carb disulphide, benz chloroform. Sparingly solubl methanol and eth Insoluble in water,acid,alka
Curcumin	Crystal form	Orange yellow	Odorless	Degradation	Occurs with ferrous oxide	8-9	Low density	Alcohol>Acetic
Riboflavin	Fine powder in needle form	Whitish yellow	Slightly Odorless	Light resistant	Dark at 240 degree	4.5-7	high	Ethanol>water>cycl
Carmine	Powder form	Bright red	Odorless	Stable	Oxidation changes blue to purple colour	11.4-13	True bulk density	Soluble in etha Insoluble in wa

TOP

Curcumin	Crystal form	Orange yellow	Odorless	Degradation	Occurs with ferrous oxide	8-9	Low density	Alcohol>Acetic

PERMITTED ARTIFICIALLY PREPARED COLOURING AGENTS:

Application (permitted mg/kg)	E-102 Tartrazine	E-104 Quinoline Yellow	E-110 Sunset Yellow	E-122 Carmoisine	E-123 Amaranth	E-124 Ponceau 4R	E-127 Erythrosine	E-128 Red 2G	E-129 Allure Red	E-131 Patent Blue	E-132 Indigo Carmine	E-133 Brilliant Blue	E-142 Green S	E-151 Brilliant Black
Confectionery	300	300	50	300	NP	50	NP	NP	300	300	300	300	300	qs
Soft Drinks	100	100	50	100	NP	50	NP	NP	100	100	100	100	100	qs
Decorations & Coatings	500	500	500	500	NP	500	NP	NP	500	500	500	500	500	qs
Snack Foods	100-200	100-200	100-200	100-200	NP	100-200	NP	NP	100-200	100-200	100-200	100-200	100-200	qs
Desserts	150	150	50	150	NP	50	NP	NP	150	150	150	150	150	qs
Edible ices	150	150	50	150	NP	50	NP	NP	150	150	150	150	150	qs
A. Beverages	200	200	200	200	30-100	200	NP	NP	200	200	200	200	200	qs
Sauces & Seasonings	500	500	500	500	NP	500	NP	NP	500	500	500	500	500	qs
Jams, Jellies & Marmalades	NP	100	100	NP	NP	100	NP	NP	NP	NP	NP	NP	100	qs
Baked Goods	200	200	50	50	NP	50	NP	NP	200	200	200	200	200	qs
Meat & Fish	100-500	100-500	100-500	100-500	NP	100-500	NP	20	100-500	100-500	100-500	100-500	100-500	qs
Soups	50	50	50	50	NP	50	NP	NP	50	50	50	50	50	qs
Processed Cheese	100	100	100	100	NP	100	NP	NP	100	100	100	100	100	qs
Mustard	300	300	300	300	NP	300	NP	NP	300	300	300	300	300	qs
Fruit Wines	200	200	200	200	NP	200	NP	NP	200	200	200	200	200	qs
Pet Food	qs	qs	qs	qs	NP	qs	qs	qs	qs	qs	qs	qs	qs	qs

PERMITTED NATURALLY PREPARED COLOURING AGENTS :

Application (permitted mg/kg)	E-110 Curcumin	E-101 Riboflavin	E-120 Carmine	E-140 Chlorophyll	E-141 Cu-Chlorophyll	E-150 (a-d) Caramel	E-153 Carbon Black	E-160a Carotene	E-160c Annatto	E-160c Paprika	E-161b Letein	E-162 Beetroot	E-163 Anthocyanins	E-171 Titanium Dioxide
Confectionery	300	qs	300	qs	qs	qs	qs	qs	NP	qs	300	qs	qs	qs
Soft Drinks	100	qs	100	qs	qs	qs	qs	qs	NP	qs	100	qs	qs	qs
Decorations & Coatings	500	qs	500	qs	qs	qs	qs	qs	20	qs	500	qs	qs	qs
Snack Foods	100-200	qs	100-200	qs	qs	qs	qs	qs	10-20	qs	100-200	qs	qs	qs
Desserts	150	qs	150	qs	qs	qs	qs	qs	10	qs	150	qs	qs	qs
Edible ices	150	qs	150	qs	qs	qs	qs	qs	20	qs	150	qs	qs	qs
A. Beverages	200	qs	200	qs	qs	qs	qs	qs	10	qs	200	qs	qs	qs
Sauces & Seasonings	500	qs	500	qs	qs	qs	qs	qs	NP	qs	500	qs	qs	qs
Jams, Jellies & Marmalades	Qs	qs	100	qs	qs	qs	qs	qs	NP	qs	100	qs	qs	qs
Baked Goods	200	qs	200	qs	qs	qs	qs	qs	10	qs	200	qs	qs	qs
Meat & Fish	100-500	qs	100-500	qs	qs	qs	qs	qs	0-10	qs	100-500	qs	qs	qs
Soups	50	qs	50	qs	qs	qs	qs	qs	NP	qs	50	qs	qs	qs
Processed Cheese	100	qs	100	qs	qs	qs	qs	qs	15	qs	100	qs	qs	qs
Mustard	300	qs	300	qs	qs	qs	qs	qs	NP	qs	300	qs	qs	qs
Fruit Wines	200	qs	200	qs	qs	qs	qs	qs	NP	qs	200	qs	qs	qs
Pet Food	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs	qs

ARTICLE BY,
Ass. Prof. MS Rathore, Richa Sood
CT Institute Of Pharmaceutical Sciences, Jalandhar.

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