

Food dyes

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Purpose of food coloring People associate certain colors with certain flavors, and the color of food can influence the perceived flavor in anything from candy to wine. [2] Sometimes the aim is to simulate a color that is perceived by the consumer as natural, such as adding red coloring to glace cherries (which would otherwise be beige), but sometimes it is for effect, like the green ketchup that Heinz launched in 1999.

Color additives are used in foods for many reasons including: [3] 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 Color additives are recognized as an important part of many foods we eat. [4] [edit] Regulation Food colorings are tested for safety by various bodies around the world and sometimes different bodies have different views on food color safety.

In the United States, FD&C numbers (which indicate that the FDA has approved the colorant for use in foods, drugs and cosmetics) are given to approved synthetic food dyes that do not exist in nature, while in the European Union, E numbers are used for all additives, both synthetic and natural, that are approved in food applications. The food colors are known by E numbers that begin with a 1, such as E100 (turmeric) or E161b (lutein). [5] Most other countries have their own regulations and list of food colors which can be used in various applications, including maximum daily intake limits.

Natural colors are not required to be certified by a number of regulatory bodies throughout the world, including the United States FDA. The FDA lists "color additives exempt from certification" for food in subpart A of the Code of Federal Regulations - Title 21 Part 73. However, this list contains substances <https://assignbuster.com/food-dyes/>

which may have synthetic origins. FDA's permitted colors are classified as subject to certification or exempt from certification, both of which are subject to rigorous safety standards prior to their approval and listing for use in foods. Certified colors are synthetically produced and are used widely because they impart an intense, uniform color, are less expensive, and blend more easily to create a variety of hues. There are nine certified color additives approved for use in the United States. Certified food colors generally do not add undesirable flavors to foods. Colors that are exempt from certification include pigments derived from natural sources such as vegetables, minerals or animals. Nature derived color additives are typically more expensive than certified colors and may add unintended flavors to foods.

Examples of exempt colors include annatto, beet extract, caramel, beta-carotene and grape skin extract. [edit]Natural food dyes Natural food colors can make a variety of different hues A growing number of natural food dyes are being commercially produced, partly due to consumer concerns surrounding synthetic dyes. Some examples include: Caramel coloring (E150), made from caramelized sugar Annatto (E160b), a reddish-orange dye made from the seed of the achiote. Chlorophyllin (E140), a green dye made from chlorella algae Cochineal (E120), a red dye derived from the cochineal insect, *Dactylopius coccus* Betanin (E162) extracted from beets

Turmeric (curcuminoids, E100) Saffron (carotenoids, E160a) Paprika (E160c) Lycopene (E160d) Elderberry juice Pandan (*Pandanus amaryllifolius*), a green food coloring Butterfly pea (*Clitoria ternatea*), a blue food dye To ensure reproducibility, the colored components of these substances are often

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provided in highly purified form, and for increased stability and convenience, they can be formulated in suitable carrier materials (solid and liquids). Hexane, acetone and other solvents break down cell walls in the fruit and vegetables and allow for maximum extraction of the coloring.

Residues of these often remain in the finished product, but they do not need to be declared on the product; this is because they are part of a group of substances known as carry-over ingredients. Natural food colors, due to their organic nature, can sometimes cause allergic reactions and anaphylactic shock in sensitive individuals. Coloring agents known to be potential hazards include annatto, cochineal and carmine. [citation needed] [edit]Artificial coloring [edit]In the United States Seven dyes were initially approved under the Pure Food and Drug Act of 1906, but several have been delisted and replacements have been found. 6] Some of the food colorings have the abbreviation " FCF" in their names. This stands for " For Coloring Food" (US) [7] or " For Colouring of Food" (UK). [8][9] [edit]Current seven In the US, the following seven artificial colorings are permitted in food (the most common in bold) as of 2007: **FD Blue No. 1 - Brilliant Blue FCF, E133 (blue shade)** **FD Blue No. 2 - Indigotine, E132 (indigo shade)** **FD Green No. 3 - Fast Green FCF, E143 (turquoise shade)** **FD Red No. 40 - Allura Red AC, E129 (red shade)** **FD Red No. 3 - Erythrosine, E127 (pink shade, commonly used in glace cherries)**[10] **FD Yellow No. 5 - Tartrazine, E102 (yellow shade)**

FD Yellow No. 6 - Sunset Yellow FCF, E110 (orange shade) [edit]Limited use The following dyes are only allowed by the FDA for specific limited applications: **Orange B (red shade)** - allowed only for use in hot dog and sausage casings. **Citrus Red 2 (orange shade)** - allowed only for use to color

orange peels. [edit]Delisted and banned FD Red No. 2 - Amaranth FD Red No. 4[11][12] FD Red No. 32 was used to color Florida oranges. [6][11] FD Orange Number 1 was one of the first water soluble dyes to be commercialized, and one of seven original food dyes allowed under the Pure Food and Drug Act of June 30, 1906. 6][11] FD Orange No. 2 was used to color Florida oranges. [6] FD Yellow No. 1, 2, 3, and 4[11] FD Violet No. 1[11] [edit]Other Locations As stated above, most other countries have their own regulations and list of food colors which can be used in various applications, including maximum daily intake limits. In the EU, E numbers 102-143 cover the range of artificial colors. For an overview of currently allowed additives see here. Some artificial dyes approved for food use in the EU include: Quinoline Yellow: E104 Carmoisine: E122 Ponceau 4R: E124 Patent Blue V: E131 Green S: E142 [edit]Dyes and lakes

Color additives are available for use in food as either " dyes" or lake pigments (commonly known as " 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, confections, dairy products, pet foods, and a variety of other products. Dyes also have side effects which lakes do not, including the fact that large amounts of dyes ingested can color stools. Lakes are made by combining dyes with salts to make insoluble compounds. Lakes tint by dispersion.

Lakes are not oil soluble, but are oil dispersible. Lakes are more stable than dyes and are ideal for coloring products containing fats and oils or items lacking sufficient moisture to dissolve dyes. Typical uses include coated

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tablets, cake and doughnut mixes, hard candies and chewing gums, lipsticks, soaps, shampoos, talc, etc. [edit]Other uses Because food dyes are generally safer to use than normal artists' dyes and pigments, some artists have used food coloring as a means of making pictures, especially in forms such as body-painting. Red food dye is often used in theatrical blood.

Most artificial food colorings are a type of acid dye, and can be used to dye protein fibers and nylon with the addition of an acid. They are all washfast and most are also lightfast. They will not permanently bond to plant fibers and other synthetics. [13] [edit]Criticism and health implications Though past research showed no correlation between attention-deficit hyperactivity disorder (ADHD) and food dyes,[14][15] new studies now point to synthetic preservatives and artificial coloring agents as aggravating ADD and ADHD symptoms, both in those affected by these disorders and in the general population. [16][17] Older studies were inconclusive, quite possibly due to inadequate clinical methods of measuring offending behavior. Parental reports were more accurate indicators of the presence of additives than clinical tests. [18] Several major studies show academic performance increased and disciplinary problems decreased in large non-ADD student populations when artificial ingredients, including artificial colors, were eliminated from school food programs. [19][20] Norway banned all products containing coal tar and coal tar derivatives in 1978. New legislation lifted this ban in 2001 after EU regulations.

Tartrazine causes hives in less than 0.01% of those exposed to it. [21] Erythrosine is linked to thyroid tumors in rats. [22] Cochineal, also known as carmine, is derived from insects and therefore is not vegan, vegetarian or

kosher. This criticism originated during the 1950s. In effect, many foods that used dye (such as red velvet cake) became less popular. [citation needed]

Brilliant Blue (BBG) food coloring was cited in a recent study in which rats that had suffered a spinal injury were given an injection of the dye immediately after the injury, and were able to regain or retain motor control.

BBG helps protect spine from ATP (adenosine triphosphate), which the body sends to the area after a spinal injury, which further damages the spine by killing motor neurons at the site of the injury. [23] Research by King Feisal University points that the use of synthetic color in various foods has adverse effects on some of biochemical analysis, specifically at high concentration and administration for along periods of time. Changes in liver and kidney histopathological structure and increases in white blood cell count indicated that inflammation is specific to certain colorants. [24]