

Analysis of Food Coloring

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ABSTRACT

This study was conducted to bring to light food coloring used in three selected dishes. The dishes were taken naming ice-cream, candy and tomato sauce applying convenience sampling method. The study revealed to take part 78.4% non food grade and 21.5 % food grade colors in widespread use in these three dishes. Various textile dye and cosmetic color were in abundance used as non food grade colors and various synthetic colors e. g. amaranth red and ponceau 4R were as food grade colors in the selected dishes.

KEYWORDS: Food Coloring, Dishes, Food Grade Colors, Non Food Grade Colors

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1. General Background

Food coloring is the dye, pigment or substances adhered to foods or drinks in order to alter the color or the trick to sustain the prevailing colors with attractive flavors to gain affluent aesthetic look. Food coloring is available in liquids, gels, powders and pastes forms to be used both in commercial food production and in domestic cooking. Food coloring is used in a variety of non food applications including cosmetics, home crafts, pharmaceuticals and medical devices by din of their safety and general availability.[1,2]

The color additives main purpose is to seem more inviting and appealing, especially to the children. The color in foods losses due to exposure to light, air, temperature, moisture and storage conditions. It corrects natural color variations and enhances natural existing colors. It provides color to colorless and "fun" foods. Food color has always been a value of quality. Without color additives, margarine won't be yellow, colas won't be brown and mint ice-cream won't be green. Color additives have come into fashion as vital part of all foods we eat.

History

The addition of colorant to foods is thought to have happened in Egyptian cities, where candy makers around 1500 BC added natural extracts and wine to improve product appearance. Up to the middle of the 19th century ingredients such as the spice saffron from the local areas to the production units were added for decorative effect to certain foodstuffs.

In 1856, the first synthetic color (mauve) was developed by Sir William Henry Perkin and by the turn of the century, unmonitored color additives had spread through the USA and Europe in all the source of popular foods, including mustard, jellies, wine and ketchup. Sellers at the time offered more than 80 artificial coloring agents, some intended for dyeing textiles, not foods. As the 1900s starting, the bulk of chemically synthesized colors were derived from aniline, a petroleum product in toxic nature. Chemically synthesized colors were easier to produce, less expensive and superior in coloring properties.[3,4]

Type of colors

The food permitted colors are some naturally derived colors, principally plant extracts, their chemically identical synthetic duplicates and chemically

synthesized compounds. The coloring matters gone to foods may be grouped into main 2 classes; natural and synthetic or artificial colors by name.

Natural colors are approved for foods include carmines or cochineal (red), carotene (orange red), saffron (orange), anthocyanin (blue), curcumin (orange and yellow), chlorophyll (green), annatto (orange) and caramel (dark brown) etc.

Synthetic or artificial colors (some are adopted worldwide) include,

Red colorants: Amaranth, carmoisine, erythrosine, fast red E, ponceau 4R and allura red AC.

1. Orange or yellow colorants: Tartazine, yellow 2G, sunset yellow FCF.
2. Blue colorants: Brilliant blue FCF, Indigo carmine.
3. Green colorants: Green FCF, Fast green S .[5,6]

Health Impact

The approved colors aren't always safe. Moreover, even the safest permitted color, if taken in excessive range proved detrimental for human health. Since synthetic dyes contained various heavy metals like Pb, Hg, As, Cu, Ni, Mg, Co etc., various studies have found that it can cause hyperactivity and lapses of concentration in children. Coloring also cause triggers hyperactivity in some sensitive children, reduce liver and duct activity, rises thyroid tumors, increase allergy-like reactions primarily in aspirin- sensitive fellows, causes tumors of adrenal gland and kidney, carcinogenic and finally death. Eating foods containing industrial dyes and colors causes violent allergic reactions, respiratory problems, asthma, liver disorders and kidney dysfunction and bone marrow disorders.

Food, as a basic need for all people must become wholesome and safe. It's only nutritive when it is pure, fresh and free from hazardous matters. Food coloring is a premier public hazard affecting the quality of life. The nature of food coloring varies from place to place. Due to illiteracy and poor knowledge on food colors, many industries use banned and synthetic or artificial colors to produce a lot of food in the country. Considering the various toxic effects of colors, the current study was planned to survey on various food color materials, including the banned ones (textile or cosmetic colors), natural, artificial in terms of development, regulations and technical regulations.[7,8]

Framework

Study Nature

The study was an observational study.

Sample Size and Information Collection

There were framed a total of 40 samples from 20 food industries to carry on the study. Industries' owners,

labors and food vendors helped to collect the information in this connection.

Questionnaire Development

A standard questionnaire was developed to gain the relevant information on the study. The query were designed, pretested, modified and resettled to achieve the recorded information easily.

Data Aggregation

Data was aggregated by asking question to the factory owners, labors, respective produces venders and color sellers in the market.[9,10]

Data Verification

Questionnaire were checked each day after interviewing and again after completion of data aggregation and coded before entering into computer technology. The data was edited if there was any discrepancy (doubt entry, wrong entry etc.).

Statistical Analysis

All the statistical analysis and all other data processing were done by using specialized analytical software program. Microsoft Word and Microsoft Excel were in frequent application on tabular, chart and graphical representation. All the statistical analysis were done very carefully in order to obtain the good accuracy of result.

Results

The study on colors using in selected 40 samples of three produces was conducted.

Table 1 represented the different colors used in total 20 industries' 40 food samples off selected three dishes.

According to the value of table 1, it was showed in items of ice-cream that 42% red, 35% green and 23% yellow, the percentage of panceau 4R and red color was in candy making was 77% and 23%. In Tomato sauce's amaranth red color.

The food grade colors were found only in 10 and the rest 30 items were made from non food grade colors. The figure 1 represented the percentage of non food grade and food grade colors used in producing ice-cream, candy and tomato sauce was found as 78.6% and 21.5% respectively.

Discussion

From the results, it is observed that yellow, red and green colors were used for e production of ice-cream which is recognized as textile dye otherwise cosmetic olors due to the ignorance and illiteracy of e manufacturers making the ultimate ictimization to the consumers. This scene as not only common in case of ice cream ut also hawaii methai and particularly andy. In candy production procedure, onceau 4R partially

used which were an artificial or synthetic color and the rest of the sample of candy from textile dyes.[11]

Food grade colors are not harmful for our body if these aren't used in excess amount but colors are being used indiscriminately over Bangladesh and the European countries began the process of eliminating artificial food colorings from foods.

The university of California San Francisco school of Medicine showed that a certain food coloring (caramel food coloring) diminishes immune system function which could alter the body's ability to fight off infection and even causing cancer. Another study revealed that ponceau 4R lowers the RBC and haemoglobin concentration in body bloodstream.[12,13]

Textile dyes can cause damage to liver, kidneys, heart, skin, eyes, lungs and bones. It also results in insufficient oxygen supply to skin and mucus membranes along with degenerative changes in the stomach, abdomen and testes. The intake of textile dye results in anaemia, nausea, constipation and epigastric pain due to toxicity.

Conclusion

The study findings divulged a greater bulk of non food grade colors in use at different food industries in India. The proportion of minor degree of food grade colors using in the industries is a bad news for the consumers and the country as a whole. It's the greatest public health threat. The GOI and different volunteer international and national organizations should take immediate bid to curb these ongoing malpractices to get rid of food adulteration.[14]

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