

Food Additives and Contaminants

Food additives are defined as any substances 'not normally consumed as food itself' which are added to food to perform a specific technological purpose e.g. preservation. Chemical additives come in many forms: stabilizers and emulsifiers that maintain consistency; preservatives that prevent spoilage; artificial flavors and colors that enhance taste and appearance; surfactants that bind ingredients together; anti-oxidants that prevent rancidity; and acids that modify tart tastes. Other chemical additives are used for a hardening, drying, coloring, leavening, non-caloric sweetening, creaming, firming, anti-sticking, whipping and sterilizing. In addition, many natural products, including salt, spices, sugar and sugar byproducts, are added to food during processing. However, the use of food additives is regulated imposing strict rules as the impact of those additives on health cannot be neglected.

The Government of India's (GOI) Food Safety and Standards Authority of India (FSSAI) has published its comprehensive list of 11,000 food additives used in various food categories. The new document was prepared on the basis of comments received from various stakeholders.

Recognized Benefits, Possible Hazards

There are multifaceted consequences of the large number of additives in the Indian food supply. Basically, there are two different and opposite opinions for food additives. FSSAI contend that existing laws and regulations insure the safety of all additives and it maintains the nation's food supply safe from disease and offer consumers a wide choice of food products. But consumer groups and others have criticized the FSSAI's testing procedures and argue that many additives are not needed. In addition, scientific tests have indicated a suspicious relationship between some additives now in use with cancer, birth defects, genetic damage and other health problems.

Additives are used liberally in laboratory-produced artificial foods which are available by the hundreds in the nation's supermarkets, restaurants, snack bars and school cafeterias. Substitutes for natural foods are used mainly by the so-called convenience food makers, whose major customers include schools, airlines, hotels and hospitals.

Some nutritionists object not only to artificial foods, but also to the additives that are necessary to hold them together and make them look and taste like the real thing. "We have raised a whole generation on fake foods," journalist Colman McCarthy wrote in 1974, "made possible by chemicals bolstering fat, water and carbohydrates, and void of vitamins, proteins and minerals." Other food experts contend that there is no difference between ingesting natural foods or their artificial imitations, since the chemical composition of each is the same. Others point out that imitation foods are less expensive to produce than natural foods and that synthetics are always "in season" and virtually limitless in supply.

But questions about food additive safety have been voiced by consumer groups and congressional committees. FSSAI has recently removed potassium bromate, which is used in bread and bakery products and cyclamates, which is used in jams, jellies, marmalades, dairy-based drinks and confectionary, from the list of permissible additives. Electrolytic oxidation of potassium bromide solution produces bromate which is classified as a category 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). One of the report's conclusions was that Indians do not eat enough fresh fruit, vegetables, grains and other natural foods and depend too much on highly refined and processed foods. Similarly, in the last two years, the FDA (Food and Drug Administration) has moved to ban two widely used artificial food additives namely Red Dye No. 2 and saccharin because tests indicated they cause cancer. Some additives inhibit the growth of certain dangerous microorganisms, particularly the bacteria spores that can cause deadly botulism. Red dye No. 2 is Amaranth (dye) likely to be a pro-carcinogen. Azo dyes that exist in hydrazone form are extremely insoluble and stable but when reduced form an amine by-product that is potentially carcinogenic. Alkylating agents derived of Saccharin are potentially carcinogenic and can cause bladder cancer.

Most artificial colors in use today are derived from coal-tar dyes. During the first decades of the century, new dyes were synthesized and added to the acceptable list. Some including Green No. 1, Orange No. 1 and 2, and Yellow No. 1, 2, 3, and 4 have been removed from the list as health hazards.

Adversities of using food additives have alarmed the scientific community for a while and tremendous research is on way to curb the problem. People are particularly growing health conscious and cautiously counting calories such that low-calorie, low-fat foods are fast gaining popularity in the United States. More and more technology-driven research is now being undertaken that will allow the production of additives in newer and more sophisticated ways e.g. the increasing stress being laid on biotechnology as it uses simple organisms to produce additives that are the same as natural food constituents. In 1990, FDA approved the first bioengineered enzyme, rennin, extracted from calves' stomachs for use in cheese making industry. It appears that some of the sectors likely to have better performance may include segments such as colors and flavors that are naturally sourced, enzyme based foods, food hydrocolloids (which are foods similar to gums), and some of the functional food ingredients. Carotene, which is found in all plants and in many animal tissues, is used as a vegetable dye in butter, margarine, shortening, skimmed milk, buttermilk and cottage cheese. Chlorophyll, the green coloring matter in plants, was used as a dye in olive and soybean oils until 1977. Natural colors in use for many years and regarded as safe by the FDA are annatto, a vegetable dye made from the pulp surrounding the seeds of the tropical annatto tree; and paprika, the finely ground pods of dried, ripe, sweet pepper that has a reddish orange color and is used in sausage and other meats, condiments and soups. As is evident from previous discussion, the inclination to spend more on naturally sourced and/or additive-free food and drinks is projected to continue in the short-term. Research and Markets has announced the addition of the "Food Additives - Global Strategic Business Report" document to their offering and enumerated the natural additives which can be promoted.

So, in looking toward the future, increases in overall population will definitely have a remarkable effect on the world's food supply. Statistically, although the level of food additives added to food vis-a-vis the total diet of an average customer is minor, the overall contribution does turn out to be significant. Ultimately, the responsibility of avoiding the risk of consuming unsafe food lies with us and herein the World Health Organization's rule-of-thumb guide says it all: keep the food clean; effort should be made to separate raw from cooked food; cook the food thoroughly; store the cooked/uncooked food at safe temperatures; and take precautions to use safe water and raw materials as far as possible. With increasing public concern about food safety issues eventually, there are four important players that will decide the future of food additives: law-makers, scientists, commercial enterprises, and finally the consumers themselves.

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