Effects of Food Additives on Human Health

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Resource Article

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1. Introduction

Originally, foods were grown and eaten directly from a relatively unpolluted Earth. Cleaner oceans, lakes and rivers fed us nutritious fish. As the human population multiplied, the world expanded, farming progressed, trade specialties developed, and town markets shared a variety of goods among a diversity of people. Techniques for food preparation and preservation, such as pickling, salting, and smoking, were developed to deal with the new problems of storage, waste, and food-borne illnesses. With advanced technology, our modern food industry's reliance on processing and additives continues to increase. For decades now, the food industry has continually created new chemicals to manipulate, preserve, and transform our food. With the use of chemicals, scientists are able to mimic natural flavors, color foods to make them look more "natural" or "fresh," preserve foods for longer and longer periods of time, and create altered versions of breads, crackers, fruits, vegetables, meats, dairy products and many more commonly used foods. Now there are even "foods" that are made entirely from chemicals. Coffee creamers, sugar substitutes, and candies consist almost completely of artificial ingredients. Such manipulation of our food can have a profound effect on our body's unique biochemical balance.

A food additive is any substance not commonly regarded or used as food, which is added to, or used in or on, food at any stage to affect its keeping quality, texture, consistency, taste, colour, alkalinity or acidity. Food additives in use today can be divided roughly into three main types: cosmetics, preservatives and processing aids, totalling presently about 3,794 different additives, of which over 3,640 are used purely as cosmetics, 63 as preservatives and 91 as processing aids. The growth in the use of food additives has increased enormously in the past 30 years, totalling now over 200,000 tonnes per year. Therefore it has been estimated that as today about 75% of the Western diet is made up of various processed foods, each person is now consuming an average 8-10 lbs of food additives per year, with some possibly eating considerably more. With the great increase in the use of food additives, there also has emerged considerable scientific data linking food additive intolerance with various physical and mental disorders, particularly with childhood hyperactivity. Food additive is also very dangerous for health. Consuming foods mixed with additives can cause negative effect like insomnia, nervousness, restlessness, irritability, and mood changes.

2. Health Effects of Food Additives

Most people who consume food additive will experience in allergies and a lot of theme will suffer from irritable bowel syndrome. Harmful effects of food additives will affect the health, mood, skin, your behavior, your bowel movements that make it difficult to defecate. Besides those mentioned above, the harmful effects of food additive was causing migraines. Migraine disease has increased threefold since the seventies. According to the study, this headaches can be overcome by preventing food additives. Switch to organic foods that are healthy and free from danger. Then, since the seventies, people with autism increased 10-fold worldwide. Based on the study, all of this relates to food additives. Simply put, food additives are dangerous to health even though famous for its natural ingredients. For example, calcium propionate used as a food preservative shown to have negative effects such as sleep disturbance, walking at night, depression, bedwetting, anxiety and nasal congestion.

Furthermore, consume foods that contain salicylates proven to cause tinnitus, vertigo, insomnia, hearing loss, behavioral changes in children and others. While food additives such as monosodium glutamate proved to be very dangerous, especially for children. The harmful effects of "monosodium glutamate" food additive is to inhibit brain development in children. So, avoid the use of food additives in order to live a healthy life. Consuming organic foods is the solution to healthier. Organic foods is best choice for kids.

3. Some Food Additives and their Side-Effects

3.1. Cosmetics; Dyes/Colourants

Tartrazine (E102), which is primarily used by the soft drink industry, is one of the colours most frequently implicated in food intolerance studies. Adverse reactions to tartrazine seem to occur most commonly in subjects who are also sensitive to acetylsalicylic acid (ASA), a finding which was also observed by Feingold and his team. Depending on the test protocol followed, it has been found that between 10-40% of aspirin-sensitive patients are indeed usually also affected by tartrazine, the reactions including asthma, urticaria, rhinitis and, as previously mentioned, childhood hyperactivity.

One study found that an oral administration of 50mg tartrazine to 122 patients suffering from allergy-related disorders, evoked the following reactions; feeling of suffocation, weakness, heat sensation, palpitations, blurred vision, rhinorrhoea, pruritus and urticaria. Even though 50mg could be considered as a substantial dose, such a quantity of tartrazine could easily be consumed by an individual drinking only a few bottles of soft drinks per day.

Another carefully conducted double-blind placebo- controlled trial on 76 children diagnosed as hyperactive, showed that tartrazine and benzoates provoked abnormal behaviour patterns in 79% of them. In addition, a double-blind placebo-controlled trial on 10 hyperactive children when compared to controls, found that tartrazine increases urinary zinc secretion, and decreases serum and salivary zinc concentration in the hyperactives, with a corresponding deterioration in their behaviour. This phenomena was not found among the controls.

It was suggested therefore that tartrazine seems to act as a zinc chelating agent in susceptible individuals. Furthermore, that zinc depletion may also be one of the potential causes of childhood hyperactivity. Although tartrazine seems to be most frequently associated with adverse reactions, there are also other colouring agents which are known to cause mental and/or physical ill-effects.

Curcumin (E100), used mainly in flour confectionery and margarine, has been found to cause mutations in bacteria and when fed to pigs, it increased the weight of their thyroid glands causing, in high doses, severe thyroid damage.

Sunset Yellow (E110), used in biscuits, has been found to damage kidneys and adrenals when fed to laboratory rats. It has also been found to be carcinogenic when fed to animals.

Carmoisine (El22), used mainly in jams and preserves, was found by the US Certified Color Manufacturers Association to be unavoidably contaminated with low levels of beta-napthylamine, which is a well known carcinogen; it has also been found to be mutagenic in animal studies.

Amaranth (El23) has been found, when fed to laboratory rats, to cause cancer, birth defects, still births, sterility and early foetal deaths. Subsequent work has also found that amaranth can cause female rodents to reabsorb some of their own foetuses.

Ponceau 4R (El24), used mainly in dessert mixes, has been found to exhibit a weak carcinogenic action.

Erythrosine (E127) , used in candied cherries and childrens' sweets, has been found to act as a potent neurocompetitive dopamine inhibitor of dopamine uptake by nerve endings when exposed in vitro on a rat brain. Other studies have shown that erythrosine can have an inhibitory action also on other neurotransmitters, resulting in an increased concentration of neurotransmitters near the receptors, thus functionally augmenting the synaptic neurotransmission. There is now some evidence that a reduced dopamine turnover may lead to childhood hyperactivity. Similar findings have been linked with a reduction of noradrenaline. Erythrosine also has been found to have a possible carcinogenic action when tested on animals.

Caramels (E150), of which over 100 different formulations are currently in use, are widely used by the cola drinks industry, as well as the beer and alcohol industry. It is also used as a colouring agent in crisps, bread, sauces, gravy browning etc. The main recurring problem about the safety of caramels concerns the presence of an impurity called 4-Methylimidazole, produced by processes using ammonia, which leads to convulsions when fed to rats, mice and chicks. It has been also found that ammoniated caramels can affect adversely the levels of white blood cells and lymphocites in laboratory animals. Furthermore, a study on rabbits provided evidence that even small doses of ammoniated caramels seem to inhibit the absorption of vitamin B_6.

Brown FK is mainly used as a colouring agent in fish, such as kippers. Two of the primary metabolites of this colouring have been found to act as a cardiotoxin. It has been also observed, when fed in the long term to mice, to cause potentially hazardous nodules to form in the liver. Furthermore it has been found to cause mutations in some bacteria, implying that it may also act as a mutagenic and/or carcinogenic agent in humans.

3.2. Preservatives/Antioxidants

Benzoates (E210-E219), used mainly in marinated fish, fruit- based fillings, jam, salad cream, soft drinks and beer, have been found to provoke urticaria, angioedema and asthma. Furthermore, they have also been directly linked with childhood hyperactivity.

Sulphites (E220-E227), used mainly in dried fruits, fruit juices and syrups, fruit-based dairy deserts, biscuit doughs, cider, beer and wine, have been linked with pruritus, urticaria, angioedema and asthma. When fed to animals, sulphites have also been found to have a mutagenic action.

Nitrates and nitrites, used in bacon, ham, cured meats, corned beef and some cheeses, have been found to cause headaches in susceptible individuals. In addition, these chemicals have been linked with cancer both in animal and human studies. They have also been found to be mutagenic when fed to mammals.

Butylated hydroxyanisole – (BHA /E320) , used in soup mixes and cheese spread, has been found to be tumour-producing when fed to rats. In human studies it has been linked with urticaria, angioedema and asthma.

Monosodium glutamate (MSG/E621), a flavour enhancer, used in savoury foods, snacks, soups, sauces and meat products, has been associated with a conjunction of symptoms in susceptible individuals, such as severe chest and/or facial pressure and overall burning sensations, not unlike a feeling that the victim is experiencing a heart attack. MSG has been also found to precipitate a severe headache and/or asthma in susceptible individuals. In susceptible children MSG has been linked with epilepsy-type "shudder" attacks. In animal studies it has been found to damage the brains of young rodents. Studies show that regular consumption of MSG may result in adverse side effects which include depression, disorientation, eye damage, fatigue, headaches, and obesity.

3.3. Sweeteners

Saccharin, used as sweetening tablets and widely used by the soft drink and sweet food industry, has been shown to produce cancer when tested on animals. Saccharin has also been found to be mutagenic and growth inhibiting, as well causing congenital malformations in animal studies. The fact that any substance which has been found to be carcinogenic also seems to have a mutagenic action, was established by testing 300 different carcinogenic chemicals for mutagenicity. The results showed that of the 300 carcinogenic chemicals tested, 90% were also found to have a mutagenic action.

Aspartame (E951), of which the key ingredient is the amino acid phenylalanine, is also widely used by the soft drink and sweet food industry. When fed to rats, aspartame was found to double the level of phenylalanine in their brains, which re-doubled when other carbohydrates were consumed at the same time. This combination was found to give a great rise in brain tyrosine, followed by a considerable reduction in brain tryptophan levels. Low tryptophan levels have been directly linked with both aggressive and violent behaviour. Aspartame, more popularly known as Nutrasweet and Equal, is found in foods labeled "diet" or "sugar-free". Aspartame is believed to be carcinogenic and accounts for more reports of adverse reactions than all other foods and food additives combined.

Furthermore, as dietary **tryptophan** acts as a precursor for serotonin (5-hydroxy-trytamine, 5HT), reduced tryptophan levels will also result in a reduction of brain serotonin levels, which has been directly linked with both hyperactive and aggressive behaviour.

4. Food Additives and Fetal Health.

Young children seem to serve always as the first sentinels of any environmental contamination, because of their immaturity of enzymatic detoxifying mechanism, incomplete function of excretory organs, low levels of plasma protein capable of binding toxic chemicals and incomplete development of physiological barriers such as the blood-brain barrier. The young, developing nervous system seems to be particularly vulnerable. For example, results of some research studies found that only the very youngest of the children tested reacted adversely to artificial food additives.

It should be stressed however that the period of organ formation and development stretches long beyond the moment of birth. The Fetal Alcohol Syndrome is a useful example, which arises with fetal exposure to neurotoxic agents such as alcohol.

Similar adverse effects have been attached to maternal smoking, to lead contamination and now, more recently, to food additives. Using animal experiments, it has been found that the fetus may be more susceptible to tumour development than an adult animal.

Evidence is also accumulating that non-carcinogenic substances may cause a variety of biochemical changes, including alterations in the fetal enzyme development at levels at which the mother is asymptomatic.

One class of compounds dangerous to the fetus, often in very low concentration, are the mutagens, which are able to react with and injure chromosomes and genes carrying the genetic code. Furthermore, it has been found that mutagens not only cause mutations but are also capable of damaging and killing living cells, thus inflicting the greatest damage very early in pregnancy or during the weeks before conception.

5. Common food additives and chemicals harmful to children

Children are smaller, so their “dose” of any given chemical ends up being higher. They put their hands in their mouths more than adults do, so they are likely to ingest more. Their bodies

are still developing, so they can be more at risk of harm — and they are young, so the chemicals have more time to do more damage.

- **Bisphenols, such as BPA.** They can act like the hormone estrogen and interfere with puberty and fertility. Bisphenols can also increase body fat, and cause problems with the immune system and nervous system. They are found in the lining of food and soda cans, plastics with the number 3 or 7, and cash register receipts, among other places. They used to be found in plastic baby bottles and sippy cups; while this has been banned, older bottles and cups may still contain them.
- **Phthalates.** These can also act like hormones, interfering with male genital development, and can increase the risk of obesity and cardiovascular disease. They are ubiquitous, found not just in plastic packaging, garden hoses, and inflatable toys, but also in things like nail polish, hairsprays, lotions, and fragrances.
- **Perfluoroalkyl chemicals (PFCs).** They can lead to low-birthweight babies, as well as problems with the immune system, the thyroid, and fertility. They are commonly found in grease-proof paper, cardboard packaging, and commercial household products such as water-repellent fabric and nonstick pans, among other places.
- **Perchlorate.** This chemical also interferes with thyroid function, and can disrupt early brain development. It's found in some dry food packaging — it's used to decrease static electricity — and sometimes in drinking water.
- **Artificial food colors.** These have been found to increase symptoms in children who have attention deficit hyperactivity disorder, or ADHD. They are found in all sorts of food products, but especially those marketed for children.
- **Nitrates and nitrites.** These can interfere with the thyroid, as well as with the blood's ability to deliver oxygen to the body. They can also increase the risk of certain cancers. They are used to preserve food and enhance its color. They are commonly found in processed foods, especially meats.

6. What is a parent to do about food additives and chemicals?

These chemicals are truly everywhere, and impossible to avoid completely. Here is what the American Academy of Pediatrics (AAP) suggests:

- Buy and serve more fresh or frozen fruits and vegetables, and fewer processed meats, especially during pregnancy.
- Since heat can cause plastics to leak BPA and phthalates into food, avoid microwaving food or beverages in plastic containers. Also: wash plastics by hand rather than putting them in the dishwasher.
- Use more glass and stainless steel instead of plastic.
- Wash hands thoroughly before and after touching food, and clean all fruits and vegetables well.

And here are a few more ideas:

- Cut back on canned foods and beverages in general.
- Cut back on fast food and processed foods.

- Read labels. Get to know what is in the products you use.
- Look for lotions, soaps, and other products that are made naturally — and are fragrance-free.

The idea is to make some simple changes that can go a long way toward keeping children and their families healthier.

7. Nutritional and Toxic Chemical Influences on Behaviour

Dietary and toxicological factors in behavioural disorders have been sadly neglected by mainstream psychiatry, even though it is known that brain function itself involves subtle chemical and electrical processes, which can be easily altered and modified with the use of various psychoactive drugs. Therefore it is difficult to comprehend why the role of nutritional influences on behaviour has been completely ignored, even though the precursors of neurotransmitter molecules, essential for the brain function, are only found in foods. Furthermore, that they cannot be synthesized nor stored by the brain, unless introduced by appropriate dietary substances.

When the availability of these dietary precursors are reduced, the neurotransmitter synthesis will become impaired, with the consequent changes in both thinking process and behaviour. When this happens, learning and memory tasks may become impaired or disturbed, intellectual development inhibited and overt behaviours disordered, depending upon which dietary precursor is deficient or missing. In addition, various neurotoxins such as alcohol, heroin, LSD, nicotine, lead, organic solvents, individual food intolerances and some food additives can modify neurotransmitter release, resulting in subtle or exaggerated behavioural changes.

8. Food Additives and Malnutrition

Another form of risk posed by additives is the loss of the nutritional value of the food, which can result in inappropriate diets and subclinical malnutrition. The wide use of food additives can contribute to malnutrition in the following ways; the common factor in most foods containing additives is high salt, sucrose and fat content.

Pure sucrose, by definition, contains literally no nutrients, only calories; fat, on the other hand, contains few nutrients and is very high in calories. In addition, foods containing additives are mainly processed foods, which have lost a substantial proportion of their nutritional value through the processing procedure.

Even though some vitamins and/or minerals are sometimes added to some foods after processing, the ratio of essential nutrients to calories is usually still quite inadequate, resulting in a high calorie, but a low nutritional, intake. This type of diet, because of the high calorie and low nutritional content, can result in less than optimum nutrition and therefore subclinical and/or marginal malnutrition.

9. Subclinical Malnutrition in Reproduction

Inefficient diet not only affects the brain and behaviour of an individual, it also has serious long-term consequences on reproduction and on the future infant's health, as a good maternal diet is of paramount importance in relation to a healthy fetal development and to a successful pregnancy outcome. For example folic acid deficiency has been directly linked with spina bifida.

Zinc in turn is involved in the process of cell differentation and replication, therefore zinc deficiency can lead to diverse teratogenic congenital malformations, and premature delivery, as well as small for gestational age babies. The adverse effects of a reduced state of other single essential nutrient compounds on reproduction have also been well documented.

Subclinical maternal malnutrition has also been frequently associated with low birth weight infants, which in turn appears to have a clear negative effect on the infant's future health .

It has been found that infants born with low birth weight are more prone in adult life to suffer from cardiovascular diseases, have a high serum cholesterol concentration, as well as suffer from hypertension, hyperlipidaemia and diabetes mellitus.

Subclinical maternal malnutrition can also lead to reduction of fetal brain development and subsequently to various intellectual deficits. The brain develops much more rapidly than most other organs in the embryo. In fact by about the 20th week of pregnancy it already contains most of the neurons present in the adult brain, excluding the cerebellum which is initially slower to develop but quicker to mature. By mid-pregnancy, almost all the neurons found in the adult brain have been produced.

If the maternal diet is not sufficient during this rapid fetal brain neuronal development, this can permanently reduce the number of neurons formed in the foetal cerebrum with its negative consequences to the future intellect.

10. Health risk of food additives and its evaluation

The evaluation of risk to human health with food additives is conducted by the Joint FAO/WHO Expert Committee on Food Additives (JECFA).This is an independent, international expert scientific group responsible for assessing the risks to human health from food additives.

As per WHO, only the food additives that undergo a JECFA safety assessment can be used. The above applies whether food additives are derived from a natural source or synthetic. National authorities, either based on the JECFA assessment or based on an independent national assessment, can then authorize the use of food additives at specified levels for specific foods. The evaluation by JECFA is based on scientific reviews of all available biochemical, toxicological, and other relevant data on a given additive.

Acceptable Daily Intake (ADI) is the starting point for determining whether a food additive can be used without having harmful effects. The ADI is an estimate of the amount of an additive

in food or drinking water that can be safely consumed daily over a lifetime without adverse health effects. Some of the examples are shown in Table 1.

Table 1. Acceptable daily intakes (ADI) and information on specifications of food additives (Joint FAO/WHO Expert Committee on Food Additives (JECFA) 2004)

Food additive	Specifications	Acceptable daily intake (ADI in mg/kg of body weight)
Annatto extract — "Annatto B"	R, T	0–7
Curcumin	R	0–3
D-Tagatose	R	0–125
Neotame	N	0-2
Polyvinyl alcohol	N	0-50
Quillaia extract	R	0-5

R: existing specifications revised T: existing specifications are tentative, information required.
N: new specifications prepared

11. What are the rules on labelling on food additives in the EU?

In the EU, food additives must be identified as ingredients of the foods in which they are used. The name or E number of the additive (e.g. citric acid or E 330) must be listed on the labels of food products as well as information about the function that the additive performs in the food (i.e. why it is used: e.g. preservative). Some common additives include: colours, preservatives, antioxidants, emulsifiers, stabilisers, thickeners, and sweeteners. An E-number signifies approval of an additive by the EU. To obtain an E-number, the additive must have been fully evaluated for safety by the European Food Safety Authority. The E-number system also serves as a simple and convenient way to label permitted additives across the range of languages in the European Union.

12. International standards for the safe use of food additives

The safety levels determined on the basis of assessments completed by JECFA are used by the joint intergovernmental food standard-setting body of FAO and WHO, the Codex Alimentarius Commission. These bodies establish levels for maximum use of additives in food and drinks. The Codex Alimentarius Commission establishes standards and guidelines on food labeling (Table 2). People who have allergies or sensitivities to certain food additives should check labels carefully. The national authorities are encouraged by WHO to monitor and ensure that food additives in food and drinks produced in their countries comply with permitted uses, conditions and legislation. National authorities are primarily responsible for ensuring that the use of a food additive is safe and complies with legislation in their respective countries.

Table 2. International standards for food additive (Acesulfame potassium used as flavor enhancer and sweetener) permitted for use under specified conditions in certain food categories (Codex Alimentarius. International Food Standards. CODEX STAN 192-1995. Adapted in 1995 and revision 2018)

Food Cat No	Food Category	Max Level	Notes	Year Adopted
01.1.4	Flavoured fluid milk drinks	350 mg/kg	161 & 188	2007
01.5.2	Milk and cream powder analogues	1000 mg/kg	161 & 188	2008
01.6.5	Cheese analogues	350 mg/kg	161&188	2008
01.7	Dairy-based desserts (e.g. pudding, fruit or flavoured yoghurt)	350 mg/kg	161&188	2007
04.1.2.3	Fruit in vinegar, oil, or brine	200 mg/kg	161 & 188	2007
04.1.2.4	Canned or bottled (pasteurized) fruit	350 mg/kg	161 & 188	2018
04.1.2.5	Jams, jellies, marmelades	1000 mg/kg	161 & 188	2007
04.1.2.7	Candied fruit	500 mg/kg	161 & 188	2007
04.1.2.9	Fruit-based desserts, including fruit-flavoured water-based desserts	350 mg/kg	161 & 188	2007
04.1.2.10	Fermented fruit products	350 mg/kg	161 & 188	2007

13. How are food additives regulated in Europe?

A true single market for food products could not exist without harmonised rules for authorisation and conditions for the use of additives. In 2008, the EU Regulation (EC) 1333/2008 on food additives which sets out the criteria by which additives are assessed, authorised and listed as approved. This regulation harmonized the European legislation of all food additives, including sweeteners and colours which were previously covered by separate pieces of legislation, and lays out the procedures for authorization, conditions of use and rules for labelling. The list of authorised food additives and their specific conditions of use can be consulted in a database on the European Commission website. Only authorized additives can be used in the EU with the foods in which they can be used and any maximum levels being described in the list. The purity required for these additives is laid down in a separate regulation defining specific purity criteria. All food additives authorized for use in the EU before 20 January 2009 must undergo a re-evaluation and risk assessment based on the latest available scientific information by European Food Safety Authority (EFSA).

14. Food and Drug Administration in Myanmar

The Food and Drug Administration (FDA) was established in 1995 as one of the divisions under the Department of Health. The FDA division was upgraded to a separate department in April, 2013. The aim of the department is to ensure the safety and quality of Food, Drugs, Medical Devices and Cosmetics in the country. FDA Headquarter is located in Nay Pyi Taw, the capital city of Myanmar, with five major divisions: Administrative division, Drug Control division, Food Control division, Cosmetic and Medical Device Control division and Laboratory

division while preexisting Yangon and Mandalay branches acting are still as major branches, control activities have greatly expanded with the establishment of new FDA branches in other Regions and State. In addition, FDA has also established branches in important border trade zones such as Muse, Kalthaung, Myawaddy and Tamu.

FDA is responsible for issuing Good Manufacturing Practice (GMP) certificate for local food manufacturing businesses, import and export recommendation, import and export health certification. Drug control activities include marketing authorization for new product, variation of existing authorization, quality control laboratory testing, adverse drug reaction monitoring, Good Manufacturing Practice inspection and licensing of manufacturers, wholesalers, enforcement activities, drug promotion and advertisements. FDA issues notification and import recommendation of medical devices and notification of cosmetics.

15. Conclusion

The use of food additives has increased enormously in the last few decades. As the result, it has been estimated that today about 75% of the Western diet is made up of various processed foods, each person consuming an average 8-10 lbs of food additives per year, with some possibly eating even more. The following adverse effects have been attributed to the consumption of food additives: eczema, urticaria, angioedema, exfoliative dermatitis, irritable bowel syndrome, nausea, vomiting, diarrhoea, rhinitis, bronchospasm, migraine, anaphylaxis, hyperactivity and other behavioural disorders. Twelve key additives to avoid and their health risks are as followed:

1. Hydrogenated Fats—cardiovascular disease, obesity
2. Artificial Food Colors—allergies, asthma, hyperactivity; possible carcinogen
3. Nitrites and Nitrates—these substances can develop into nitrosamines in body, which can be carcinogenic
4. Sulfites (sulfur dioxide, metabisulfites, and others)—allergic and asthmatic reactions
5. Sugar and Sweeteners—obesity, dental cavities, diabetes and hypoglycemia, increased triglycerides (blood fats) or candida (yeast)
6. Artificial Sweeteners (Aspartame, Acesulfame K and Saccharin)—behavioral problems, hyperactivity, allergies, and possibly carcinogenic. The government cautions against the use of any artificial sweetener by children and pregnant women. Anyone with PKU (phenylketonuria—a problem of phenylalanine, an amino acid, metabolism) should not use aspartame (Nutrasweet).
7. MSG (monosodium glutamate)—common allergic and behavioral reactions, including headaches, dizziness, chest pains, depression and mood swings; also a possible neurotoxin
8. Preservatives (BHA, BHT, EDTA, etc.)—allergic reactions, hyperactivity, possibly cancer-causing; BHT may be toxic to the nervous system and the liver
9. Artificial Flavors—allergic or behavioral reactions
10. Refined Flour—low-nutrient calories, carbohydrate imbalances, altered insulin production
11. Salt (excessive)—fluid retention and blood pressure increases
12. Olestra (an artificial fat)—diarrhea and digestive disturbance

In order to improve the present situation, the following recommendations are made;

1. All non-essential food additives should be banned, particularly all cosmetic agents such as food colourants.
2. All foods which include additives with carcinogenic, mutagenic and teratogenic properties should be clearly labelled with the appropriate warning.
3. All food additives should be banned from foods which may be consumed by infants and young children.
4. The amount of TV advertising which encourages children to buy and eat unhealthy junk food should be vigorously cut down as children are presently surrounded by images promoting extremely unhealthy eating habits.
5. All foods that have little or no nutritional value should be discouraged from all promotions.
6. Local Education Authorities should include in their health education curricula specific lectures stressing the prime importance of good nutrition in both physical and mental health.

The Government must pass a law refusing permission for the food industries to add continuously into our everyday foods and beverages demonstrably toxic agents for cosmetic purposes only. If not for any other reason, at least in order to protect the health of our significant population of young children, youths, adolescents and adults, as well as the health of our future generation.

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