

A compilation of observations among physicians, researchers and lay people who have demonstrated the link between aspartame consumption and the cascade of adverse neurodevelopmental and physiological complications occurring epidemically among children and; foundational science and observations regarding the link of adverse neurodevelopmental and physical complications of monosodium glutamate consumption.

This report has been prepared especially for parents, physicians, teachers, school administrators and lawmakers so they may understand the short and long-term dangers of aspartame consumption and the importance of removing from school cafeterias, vending machines and student stores food products that contain aspartame.

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Report on Aspartame and Children

By Ralph G. Walton, M.D.

Although undoubtedly well intentioned, any attempt to replace sugared beverages with aspartame containing diet products will, in my opinion, have a devastating impact on the health of our children and adolescents. The alarming increase in obesity, type II diabetes, and a wide variety of behavioral difficulties in our children is obviously attributable to multiple factors, but I am convinced that one powerful force in accentuating these problems is the ever increasing use of aspartame.

Aspartame is a multipotential toxin and carcinogen. The dipeptide component of the molecule can alter brain chemistry, significantly changing the ratio of catecholamines to indolamines, with resultant lowering of seizure threshold, production of carbohydrate craving and in vulnerable individuals leading to panic, depressive and cognitive

symptoms.

The methyl ester component of aspartame is metabolized to methanol, which in turn is broken down into formic acid and formaldehyde. Methanol can lead to serious eye problems, formic acid and formaldehyde are potent carcinogens. The diet food industry and the F.D.A. are fond of saying that aspartame is "the most studied product in history" with an outstanding safety record. In fact however virtually all of the studies in the medical literature attesting to its safety were funded by the industry, whereas independently funded studies, now numbering close to 100, identify one or more problems. It would be especially tragic if an attempt to improve the health of our children led to even greater exposure to this highly toxic product. Thank you for your attention to this urgent public health issue.

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Dr. Walton's study on aspartame: "Adverse Reactions to Aspartame: Double-Blind Challenge in Patients from a Vulnerable Population:

<http://www.mindfully.org/Health/Aspartame-Adverse-Reactions-1993.htm>

Dr. Walton's research on Scientific Peer Reviewed Studies and Funding:

<http://www.dorway.com/doctors.html#walton>

The Dangers of Aspartame

Russell Blaylock, MD, is arguably the world's foremost authority on the biochemistry of aspartame and its effect on brain function. Dr. Blaylock classifies aspartame alongside monosodium glutamate as an "excitotoxin"-substances that overstimulate brain cells causing cascades of neurological complications. His book, "Excitotoxins: The Taste that Kills," is considered by many to be a definitive work in the field of excitotoxicity.

By Russell Blaylock, MD

In 1965, a researcher at G.D. Searle pharmaceutical company inadvertently discovered the artificial sweetener aspartame while working on an anti-ulcer medication. It was discovered that the sweetener was about 150 times sweeter than an equal amount of sugar. Over the next decade, the research staff at the G.D. Searle Company conducted a series of studies in an effort to get the product approved by the FDA.

Over all this consisted of about 11 different studies. In 1974 aspartame was approved for use only in dry foods. Its approval was based on these studies. Yet, even before these studies were being presented to the FDA, the pharmaceutical giant was under investigation for improprieties associated with several of its other drugs.

No basis for reliance

During this investigation, Dr. Adrian Gross was placed in charge of examining these studies and Jerome Bressler was assigned to examine three of the studies. This investigation included a thorough examination of the pathology laboratory used in the tests, interviews with the scientists and technicians involved and a careful analytic review of the studies themselves.

In a letter to Senator Howard Metzenbaum, Dr. Gross discussed many of their findings in this investigation. He pointed out that at the heart of the regulatory process was the ability of the FDA to "rely upon the integrity of the basic safety data submitted" to the FDA. Further, he says, "Our investigation clearly demonstrates that, in the case of G.D. Searle Company, we have no basis for such reliance now."

He then pinpoints why he had reached this conclusion, when he states:

"Through our efforts, we have uncovered serious deficiencies in Searle's operations and practices which undermine the basis for reliance on Searle's integrity in conducting high quality animal research to accurately determine or characterize the toxic potential of its products."

Who cares about the unborn?

Dr. Gross expressed his disdain at the way teratology experiments were conducted. These are critical tests with any new drug because it determines possible dangers to unborn children when their mothers are exposed to the product during pregnancy. He found that technicians responsible for the tests had no formal training in teratology or toxicology. In fact, they were given some books by the company and trained themselves for three months.

Unlawful carcinogenicity

Of most concern was the way the carcinogenicity tests were conducted. These are tests to see if the product could cause cancer. According to the law, any product intended as a food product cannot have demonstrated cancer-causing ability at a dose 100 times that which is commonly consumed.

Even though the tests were poorly conducted they did demonstrate that aspartame was associated with a dramatic, dose-dependent, increase in a variety of brain tumors-mainly astrocytomas-the type commonly seen in humans. This means that the higher the dose of aspartame the more tumors that were found.

The most appalling findings were by Dr. Bressler's investigation group. They found that in several instances malignant tumors were classified as benign and that in others, tumors were removed from rats and tissue slides and reported as normal.

Neurotoxic ingredients

Dr. John Olney, a neuropathologist and neuroscientist, pointed out to FDA investigators that aspartame contained at least two distinct components that could harm the brain—diketopiperazine and aspartic acid. The former is a suspected carcinogen and the latter an excitatory amino acid. As a world expert on excitotoxicity, a process where amino acids such as aspartic acid and glutamic acid causes brain cells to be excited to death, he understood the real danger to babies and small children. His laboratory studies had demonstrated that high dose aspartame could cause the very same brain injury as other excitotoxins.

The 1974 approval was withdrawn and after the results of these investigations were reviewed privately, aspartame was given approval once again in 1981. Ironically, it was approved using the very same studies that resulted in it being banned as too dangerous for human consumption in 1975.

Aspartame and brain tumors

In 1981, Arthur Hull Hayes was appointed commissioner of the FDA and in 1983 he approved aspartame for use in beverages. Three months later he left the FDA and accepted a position as the Senior Medical Advisor to Searle's PR firm of Burson-Marsteller.

Despite the objections of Dr. Olney and other neuroscientists and pathologists, the product was given approval, essentially for all foods and beverages.

In 1992, Dr. Olney published a study that suggested that the significant rise in human brain tumors was related to the widespread use of aspartame, since it began after the approval of aspartame in foods and beverages. In Searle's original study Dr. Olney found that there was a 47-fold increase in brain tumors in the rats exposed to high dose aspartame. Even Searle's figures showed a 25-fold increase in brain tumors.

Using existing data, Dr. Olney and his co-authors found a 65-percent increase in brain tumors in humans since aspartame was approved by the FDA. Dr. H.J. Roberts also reported a similar rise in a rare form of brain cancer associated with aspartame use.

Brain tumors in lab rats-and people

And a recent study by one of Europe's most prestigious oncology groups (a million dollar study) found a non-statistically significant increase in brain tumors in 1,800 rats tested using aspartame. The control animals, which received no aspartame, developed no brain tumors, whereas the aspartame exposed animals developed 10 malignant gliomas, 1 medulloblastoma and 1 malignant meningioma. I have had contact with a number of young women who have developed brain tumors (astrocytomas) following heavy use of aspartame products. When we combined the experimental studies with the clinical data it is obvious that aspartame is strongly linked to brain tumors and most likely lymphomas

and leukemias.

Of great concern is the study by Trocho and his co-workers from the University of Barcelona, which found that aspartame was absorbed and then broken down into its component parts, including methanol and the methanol was further broken down into formic acid and formaldehyde. Using sophisticated radioactive labeling techniques he proved that the formaldehyde from the aspartame attached itself to the DNA, RNA and proteins of cells and that it was very difficult to removed. Further, they showed that the formaldehyde caused breaks in the DNA.

This has major implications in humans, since DNA damage, as was seen in their study, causes a multitude of cancers in humans as well as worsening of autoimmune diseases, diabetes and neurodegenerative diseases such as Alzheimer's dementia, Parkinson's and ALS. It also causes concern because DNA breaks in the DNA in sperm and ova can cause increased cancer risk and developmental problems in the offspring of mothers and fathers consuming aspartame products.

In the Bressler examination of the Searle tumor study they found that the female animals exposed to aspartame had a very high incidence of uterine polyps, which were rare in rats not exposed. In fact, at even moderate doses, there was a 15-fold increase in uterine polyps. In addition, they found several ovarian tumors, breast fibroadenomas, several pituitary adenomas, several lymphomas and pancreatic tumors.

Contemporary confirmation

The new million-dollar study by Dr. Morando Soffritti and co-workers found a dramatic increase in malignant lymphomas and leukemias in female rats consuming even low doses of aspartame-doses known to be consumed by millions of children, pregnant women and others. Their carefully done study concluded that most likely it was the formaldehyde breakdown product from the aspartame that was causing the cancers, which confirms what Trocho and co-workers had found earlier. Formaldehyde is known to be a powerful toxin and carcinogen, even in low concentrations.

WARNING for pregnant women

Of great concern was the finding by Trocho, that formaldehyde tends to accumulate in the DNA and is difficult to remove. This means that drinking even a single diet cola sweetened with aspartame can eventually produce significant DNA damage to raise one's risk of cancer and other diseases. Today, over 5,000 products contain aspartame. It is also important to appreciate that we are exposed to a number of toxic and carcinogenic chemicals, which can add to aspartame's toxicity.

There are sufficient studies on the effect of aspartame on the developing fetus to draw serious concern about the safety of this product. For example, it has been shown that aspartame in the dose accepted as safe by the FDA (50 mg/kg/day) can produce phenylalanine levels in a large number of women and their babies during pregnancy-large

enough to produce abnormal development of the baby's brain. This is because phenylalanine interferes with the normal migration and connections of the developing brain. In my estimation, pregnant women should never consume foods containing aspartame at any level, for the reasons I have discussed. The aspartic acid, phenylalanine and methanol are all known to produce abnormal development of a baby's brain.

Revealing side study

There is also evidence from the studies done by Dr. Ralph Walton, indicating that depressed people are especially sensitive to the toxic effects of aspartame and that this is especially true of those with suicidal tendencies. In a separate study he has shown that virtually all of the independently conducted studies done on aspartame safety have found problems with the product, yet not a single study funded by the makers of aspartame (now Monsanto) reported even minor problems.

This is especially puzzling when you consider that among all the food-related complaints registered by the FDA, 75 percent to 85 percent are related to aspartame. This alone should tell us there is a problem.

There are sufficient independent studies to show that aspartame is a dangerous product and that it should have never been given approval. In fact, it was approved using the same shoddy studies alluded to by Dr. Adrian Gross in his letter to Senator Howard Metzenbaum.

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On autism: <http://www.dorway.com/blayautism.txt>

On brain problems: <http://www.dorway.com/blayart1.txt>

Excitotoxins, Neurodegeneration and Neurodevelopment:

<http://www.dorway.com/blayenn.html>

Miami Herald Letter, Exposing Calorie Control Council, front group:

http://www.wnho.net/mh_aspartame_letter.htm

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Aspartame products: Potentially dangerous to infants, children and future generations

"The chemicals we ingest may affect more than our own health. They affect the health and vitality of future generations. The danger is that many of these chemicals may not harm us but will do silent violence to our children."

~Senator Abraham Ribicoff (1971)

By H. J. Roberts, M.D., FACP, FCCP

I have studied the numerous adverse effects of products containing the chemical aspartame for a quarter century as a corporate-neutral physician (board-certified internist; member of the Endocrine Society and American Academy of Neurology). I encompassed these adverse effects as "aspartame disease" in my large text, "Aspartame Disease: An Ignored Epidemic" published in 2001.

The prime motive for this ongoing effort to remove aspartame from products available in commerce is the enormous toll in illness, disability and death attributable to aspartame disease...and failure of the medical profession and many governmental and other public health agencies to concern themselves with this ignored epidemic. The fact that over two-thirds of adults in our society consume aspartame products, and approximately 40 percent of children, often in prodigious amounts, provides perspective.

Perhaps the most grievous aspect pertains to the damage that these products can induce in infants and children. Moreover, aspartame could affect subsequent generations borne to mothers who were misled about the safety of this and related chemicals. Indeed, some who regard the widespread promotion of aspartame products to these groups as "crimes against humanity" have urged the banning of aspartame products for their imminent threat to human health.

A case in point is the full page ad that appeared in *Functional Foods & Nutraceuticals* magazine (November 2004) titled, "Remember your first taste of Aspartame?" depicting an infant feeding at its mother's breast (see page 15). It noted that the chief ingredients of aspartame are two building blocks of protein "...just like those founds in eggs, fruit cheese or fish - and even in mothers' milk."

In my January, 2005 objection to the U.S. Federal Trade Commission about such perceived deceptive advertising in "a material respect," I listed the following reasons:

- (1) omission of other major components of aspartame, especially the 10 percent free methyl alcohol (methanol)
- (2) the profound adverse effects of the large amounts of its "two building blocks of protein" on neurotransmitters and other important systems, and
- (3) the absence of any references to the terrible reactions induced by aspartame products in numerous infants and children."

Aspartame disease in infants and children

The manifestations of aspartame disease in young children include severe headache, convulsions, unexplained vision loss, rashes, asthma, gastrointestinal problems, obesity, marked weight loss, hypoglycemia, diabetes, addiction (probably largely due to the methyl alcohol), hyperthyroidism, and a host of neuropsychiatric features. The latter include extreme fatigue, irritability, hyperactivity, depression, antisocial behavior (including suicide), poor school performance, the deterioration of intelligence and brain tumors.

Each of these disorders and the underlying mechanisms is detailed in my books, especially *Aspartame Disease: An Ignored Epidemic*. They tend to be magnified in patients with unrecognized hypothyroidism (underactive thyroid), hypoglycemia (low blood sugar reactions), diabetes and phenylketonuria (PKU). Persons with PKU lack the enzyme needed for handling phenylalanine, one of the amino acids (It's dramatic increase in the body can cause severe neurological and other damage if aspartame abstinence and other dietary precautions are not instituted).

It is my further opinion that exposure to aspartame products and other neurotoxins may initiate or aggravate changes in the nervous system that result in multiple sclerosis, Parkinson's and Alzheimer's diseases. The latter issue is detailed in my book, "*Defense Against Alzheimer's Disease*."

Pregnant women and nursing mothers

I continue to urge ALL pregnant women and mothers who breast-feed to avoid aspartame products...advice that many of my obstetric colleagues have adopted.

This precaution has been dramatically demonstrated as valid by the occurrence of convulsions in suckling infants as the mother drank an aspartame soda. The scientific grounds for the foregoing continue to increase. They include:

- exposure of the fetus to considerable phenylalanine and methanol
- maternal malnutrition associated with nausea, vomiting, diarrhea and a reduction of calories
- transmission of aspartame and its breakdown components via the mother's milk
- the increased "allergic load," thereby risking future hypersensitivity problems

Birth defects and subsequent generational stigmas

The finding of aspartame metabolites in DNA clearly has profound implications. I have described severe problems in the fetus or the infants of parents-including fathers-who consumed aspartame at the time of conception and/or during pregnancy.

Epidemiological studies will be necessary to corroborate the role of aspartame consumption in medical, neurological, metabolic, immune and neoplastic disorders involving subsequent generations.

The urgent need for action

It is clear to all who have studied the matter that the initial approval of aspartame by the FDA in 1981-in the face of severe objections from its in-house scientists, consultants for the General Accounting Office, and even a Public Board of Inquiry-was an erroneous political decision. This opinion is supported by considerable clinical experience, an increasing number of credible scientific studies, and demographic evidence relating to the contributory role of aspartame sodas and other products in the dramatic increase of obesity, diabetes, attention deficit disorder, brain tumors and other malignancies in children.

In the light of this information, it is incumbent upon governmental agencies and consumers to severely curtail or stop the use of ALL aspartame products-including aspartame-sweetened vitamins, drugs and supplements. This also applies to a number of derivatives of aspartame and other chemicals that have not been evaluated by corporate-neutral investigators over sufficient periods of time using real-world products. Failure to do so invites the tragedy of a human "silent spring."

The full spectrum of the mild to severe, even lethal adverse effects of aspartame use have been detailed in Dr. Roberts' numerous articles, reports, studies letters and books. A comprehensive list of references to the literature Dr. Roberts has published on the subject of aspartame is available at http://www.wnho.net/aspartame_potential_danger.htm

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Nutrasweet and Cancer

By Joseph Mercola, MD

Dr. Morando Soffritti and his international team of researchers have been investigating the link between aspartame and leukemia for a number of years. Last fall, we received the first tidbits about his long-term study of aspartame on rats and more horrible health risks.

His study is finally published, and the news is as bad as expected. More than 200 million people consume aspartame in their foods, drinks, vitamins and toothpaste, among other things, and their exposure to it frequently begins in the womb, so there's simply no telling how massive the problem truly is.

Will Dr. Soffritti's latest findings provoke far more scrutiny about the debatable safety of artificial sweeteners? I certainly hope so.

However, it will probably retain its profit-motive driven defenders, such as former G.D. Searle CEO Donald Rumsfeld. But despite their claims, the evidence is quite compelling that artificial sweeteners are not good for you; leukemia is just one of more than 90 different related symptoms that have been documented in humans who ingest aspartame.

If you are time pressured like me and just don't have the time to read the enormous amount of compelling evidence that makes the case for why you or anyone you love should never consume aspartame, then I would strongly recommend ordering the video "*Sweet Misery*." (<http://www.soundandfuryproductions.com>)

Without question, it is the single best summary of the issues of aspartame toxicity and some of the leading crusaders for bringing the truth to the public are in the film.

The phenylalanine in aspartame dissociates from the ester bond and increases dopamine levels in your brain. This can lead to symptoms of depression because it distorts the serotonin/dopamine balance. It can also lead to migraine headaches and brain tumors through a similar mechanism. Furthermore, the aspartic acid in aspartame is a well-documented excitotoxin. Excitotoxins are usually amino acids, such as glutamate and aspartate. These special amino acids cause particular brain cells to become excessively excited, to the point they will quickly die. Excitotoxins can also cause a loss of brain synapses and connecting fibers.

Then the ester bond in aspartame is broken down to formaldehyde and methanol, which have their own toxicities. So it is absolutely no surprise that leukemia is associated with using it.

If you are having trouble kicking the, in this case, "diet" soda habit, then please read our recent article on how to easily get rid of your soda addiction (go to <http://www.mercola.com>).

And if you're drinking diet drinks in an attempt to lose weight, they won't help you; diet soft drinks can double your obesity risks. If you want to lose weight, eat according to your metabolic type and start an appropriate exercise plan.

Dr. Mercola is proponent of health freedom through informed consent and hosts one of the world's most dynamic and comprehensive health information websites at <http://www.mercola.com>. Those who have an interest in medical issues affecting themselves and their families are encouraged to visit the site to obtain cutting edge news and health information.

Brain Damage in Infant Mice Following Oral Intake of Glutamate, Aspartate or Cysteine

By John W. Olney, MD

Striking degenerative changes in the infant mouse retina after subcutaneous treatment with monosodium glutamate (MSG) were reported by Lucas and Newhouse in 1957(1). Other studies (2-4) established that the process of retinal degeneration induced by MSG treatment is a remarkably acute and irreversible form of neuronal pathology. Recently it was found that a similar process of acute neuronal necrosis occurs in several regions of the infant mouse brain after subcutaneous treatment with MSG, and that animals treated

with high doses in infancy tend to manifest obesity and neuroendocrine disturbances as adults (7,8). The arcuate nucleus of the hypothalamus is an area particularly vulnerable to glutamate induced damage in infant animals of several species (mice and rats (7), rabbits and chicks and the rhesus monkey (3)), In mice, which have been studied more extensively for MSG induced disturbances than other species, the infant animal suffered hypothalamic damage from a relatively low subcutaneous dose (0.5 g/kg of body weight) (7).

Because of the widespread practice of weaning human infants on foods which are not only rich in natural glutamate content but may contain substantial quantities of glutamate (MSG) added for flavouring (10,11), it is important to establish whether damage to the infant central nervous system could follow from oral as well as from parenteral administration of glutamate (12). We describe here experiments which demonstrate hypothalamic damage in infant mice following relatively low oral doses of glutamate, and also report that orally administered aspartate and cysteine can induce retinal and hypothalamic damage.

Seventy-five Webster Swiss albino mice, 10 to 12 days old, were given single oral doses of a 10 per cent aqueous solution of MSG at one of 5 dose levels (0.25, 0.5, 0.75, 1.0 or 2.0 g/kg). Ten control animals were intubated but given no treatment, and an additional 46 were given single oral doses of other test compounds, as shown in Table 1. Accurate dosage control was ensured by use of an improvised flexible gastric tube inserted gently through the mouth and esophagus into the stomach. About 5 h after treatment, each animal was anaesthetized with chloral hydrate and killed by perfusion fixation of the central nervous system with 1.5 per cent glutaraldehyde and 1 per cent paraformaldehyde in 0.1 M cacodylate buffer. After 15 min of perfusion, the retinas and brain areas of interest were further fixed in osmium tetroxide and processed by a technique described elsewhere' which permits alternative examination of any specimen by either light or electron microscopy. To provide a rough 3 g/kg., Aspartate and cysteine, however, were striking exceptions because each animal treated with these compounds developed both retinal and hypothalamic lesions which seemed identical to those which are usually found after treatment with MSG. The possibility that glutamate and aspartate are additive in their toxic effect was suggested by the observation that every one of eight animals treated orally was a mixture of MSG (0.5 g/kg) and sodium aspartate (0.5 g/kg) developed a degree of hypothalamic damage characteristically seen in animals treated with either agent as 1 g/kg (Table 1).

Curtis (13) and others have found that glutamate, aspartate and cysteine comprise a select group of amino acids (the "neuroexcitatory" amino acids) which can depolarize nerve membranes. Whether the striking ability of this select group of compounds to induce neuronal necrosis in the immature central nervous system relates to their ability to depolarize nerve membranes need further study. Because glutamate is a naturally occurring constituent of dietary protein there has been little tendency to question its safety for human infant consumption. But, in our experiments, both glutamate and aspartate are toxic to the infant mouse at relatively low levels of oral intake and, when taken together, these common amino acids have an additive brain damaging effect.

Contrary to conclusions which others have reached from studies on adult animals (12) these experiments with tube fed infant animals raise serious questions concerning the advisability of supplementing the human infant diet with MSG.

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Diet and Schoolwork

The Impact of a Low Food Additive and Sucrose Diet on Academic Performance in 803 New York City Public Schools, Schoenthaler SJ, Doraz WE, Wakefield JA, *Int J Biosocial Res.*, 1986, 8(2); 185-195.

" The introduction of a **diet policy** which lowered sucrose, synthetic food color/flavors, and two preservatives (BHA and BHT) over 4 years in 803 public schools was followed by a **15.7% increase in mean academic percentile ranking** above the rest of the nation's schools who used the same standardized tests. Prior to the 15.7% gain, the standard deviation of the annual change in nation percentile rating had been less than 1%. Each school's academic performance ranking was negatively correlated with the percent of children who ate school food prior to the diet policy changes. However, after the policy transitions, the percent of students who ate school lunches and breakfasts within each school became positively correlated with that school's rate of gain ($r = .28, p < .0001$)."

Table 1
**National Rankings of 803 New York City Public Schools Before and After Diet
Changes**
Percentile Rankings based on CAT Scores

Excerpt from study, describing the above chart:

"Before the diet change, very little change occurred in mean academic percentile rank for the 803 schools. The average fell just less than 1% per year . . . The only year with a gain was 1977-78 and that was limited to 1.7%. The mean national performance rankings of the 803 public schools stood at 39.2% in the spring of 1979.

The first major diet policy revisions restricted sucrose levels to 11% in all foods during the fall of 1979. Two synthetic food colors were also eliminated. In the spring of 1980, mean national percentile rank rose to 47.3% - an 8.1% increase (s.d.=.20). During the 1981 academic year, the remaining foods containing synthetic colors and all foods with synthetic flavors were eliminated. Rank increased 3.8% to 51.2% (s.d.=.10)

During 1982, no further revisions were made. Mean national percentile rank declined slightly to 50.8% (s.d.=.01). However, when foods containing BHT and BHA were eliminated during the fourth year, rank increased to 54.9 -- a 3.7% increase (s.d.=.20)."

Science, experience proves chemical food additives impair learning; wholesome food enhances learning

By the Feingold Association

The children in elementary and high schools today are the future of our country. We would never knowingly do something to harm their health or to make it difficult for them to take their proper places in society to sustain our country through the next generation.

Perhaps the word "knowingly" is the problem - for as long as we can close our eyes and

not know it, we don't have to deal with it. However, there is a serious problem in our communities across the country. In spite of spending more money than ever before on education, our children are not getting educated. They are increasingly presenting with learning problems, behavior problems, attention deficits, impulse control, etc. They are increasingly diagnosed with attention deficit disorders, autism, and asthma. Tourette Syndrome - which only 25 years ago could not even be diagnosed by most psychiatrists and neurologists because they had never seen a case - is now recognized by every pediatrician. To top it off, childhood obesity and diabetes - matched by other eating disorders of various kinds - are overwhelming our ability to deal with them.

While it is recognized that obesity and diabetes type 2 are related to eating patterns, the neurological disorders are usually considered genetic. I want to make it very clear, however, that it is impossible to have an epidemic of a genetic disorder. This generation's children are not mutants - the genes were always there.

What happened?

The environment has changed. The food supply has changed and now includes an ever-increasing number of additives and synthetic chemicals - most of which have been shown by research to increase weight ^{1, 2, 3, 4} (MSG, aspartame, food dyes, BHT) as well as to increase damage to DNA and worsen attention span and behavior. ^{5, 6, 7, 8} See some of the research at <http://www.diet-studies.com>

What about the studies that showed diet has no effect?

In 1973, the American Medical Association mandated that research should be done on the new epidemic of "hyperkinesis" and its possible connection with food additives, as proposed by Dr. Ben F. Feingold. The "Nutrition Foundation" (an organization composed of Dow Chemical, Coca Cola, and various additive manufacturers and distributors ⁹) agreed to fund such studies. They were certainly a questionable source of unbiased research.

Early studies, therefore, used unrealistically small amounts of coloring and most ignored the thousands of flavoring chemicals and the petroleum-based preservatives altogether - nevertheless when all studies are seen together, the results are clear. Whether the study used a Feingold-type diet or an oligoantigenic (few foods) diet, about 70% to 80% of children improved. When these improved children were then challenged by some amount of food coloring, how many reacted varied directly with the amount of coloring used. *See Graph #1 below.*

The most astonishing part of all this research is that in the studies at the left side of the graph above, in which only a few children reacted to the coloring - in other words, they stayed well - it was reported that the diet didn't work, when in reality the diet continued working so well that the small amount of coloring offered could not un-do it. It was the

challenge that wasn't working!!

You may have been told that "studies show" that only a few percent of children react to colorings, and that only the youngest are affected. Look again at the left side of *Graph #1*: If you used 1 mg or so of *cocaine*, you might be able to prove it is safe, too, using their methods. And of course only the youngest would react to such a challenge; it is like trying to prove that aspirin is effective medicine, by using only baby aspirin. You will "prove" that aspirin only works for babies, and that it does nothing for adults.

So what do studies really show?

The following list of typical studies show the percentages of children whose behavior improved when given a diet eliminating artificial food colorings, flavorings, and preservatives (Some of these diets also eliminated salicylates and/or allergy-prone foods, some did not):

? Egger 1985
? Swanson 1980
? Rowe 1988
? Egger 1989
? Kaplan 1989
? Egger 1992
? Carter 1993
? Rowe 1994
? Boris 1994
= **81.6**
= **85**
= **72.7**
= **80**
= **50+**
= **76**
= **75.6**
= **75**
= **73**

What about asthma?

Asthma is an autoimmune disorder, also at epidemic dimensions and increasing. When considering triggers and treatments, be aware that the American Academy of Pediatrics Committee on Drugs in their journal, *Pediatrics* (1985) listed the following colorings as bronchoconstrictors: ¹⁰

FD&C Red #2
FD&C Red #3
FD&C Red #4
FD&C Yellow #5

FD&C Yellow #6
FD&C Blue #1

While a bronchoconstrictor may or may not directly cause an asthma attack, it certainly prepares the child for an attack to be more easily triggered by the next allergen that happens by. Would it not be reasonable to avoid these colorings?

What about the preservatives?

BHA and BHT are listed as "reasonably anticipated to be a human carcinogen" in the U.S. Government's Annual Report on Carcinogens. Some studies ⁴ have also shown BHA and BHT to increase body weight and cause some neurobehavioral problems. Stokes (1974) reported that "BHA-treated offspring showed **increased exploration, decreased sleeping, decreased self-grooming, slower learning, and a decreased orientation reflex**. BHT-treated offspring showed **decreased sleeping, increased social and isolation-induced aggression, and a severe deficit in learning**." ⁵

As for TBHQ - now used pervasively in oils by all fast food restaurants - it is a metabolite of BHA, and according to Schilderman (1993) it "**appeared to be a strong inducer of oxidative DNA damage**." ¹¹ Not a nice chemical to give our babies, is it?

MSG and aspartame?

Again, MSG and aspartame (NutraSweet) are both known for years as "excitotoxins." MSG has been shown to increase appetite (and weight), and one of the side effects of aspartame is weight gain. Both have been shown to cause migraine ^{12, 13} in sensitive people. Make a child sick every day and how well will he do academically?

What can you do?

Do what these schools have done:

Raising Test Scores: Many schools have made simple changes that have yielded dramatic results in academic achievement.

- In 1979 students in Greater New York City's 803 public schools scored in the 39th percentile on the California Achievement Test. By 1983 they had gained over 15 points and scored in the 55th percentile. A graph and discussion are attached. ¹⁴
- When Al Bullock accepted the job of principal for the Gordon Middle School (in a bad section of Philadelphia) the school's test scores were at rock bottom. By the end of the year the school ranked among the top ten percent in the state. The US Department of Education named Gordon a Blue Ribbon School - one of the best 200 secondary schools in the country. ¹⁵
- The Appleton, Wisconsin Alternative High School was not only dealing with very low test scores, the discipline problems in the small school required a full time

policeman on the staff. Today the students are learning and achieving, and discipline is no longer a problem. ¹⁶

Changing the cafeteria can change the classroom

The change all of these schools have in common is that they removed the chemical stew they had been feeding the children and replaced it with real food. The changes were not difficult, nor were they expensive.

Some synthetic food additives have been shown to interfere with the brain's ability to function.

Swanson Study ¹⁷ - Children were given a blend of food dyes and then were tested. The researchers reported, "The performance of the hyperactive children on paired-associate learning tests on the day they received the dye blend was impaired relative to their performance after they received the placebo..."

Liverpool Study ¹⁸ - Researchers at the University of Liverpool exposed nerve cells from mice to combinations of widely-used additives and measured the resulting growth of the cells. The additives studied were: blue dye, yellow dye, MSG, aspartame (NutraSweet, Equal). While each additive caused damage to the nerve cells, the combination of two additives increased the damage four-fold and seven-fold.

The additives not only stopped the growth of the nerve cells, they also interfered with the ability of the nerves to send and receive signals. The researchers expressed concern about how these additive combinations may affect a child's brain.

See many other studies in the peer review literature at <http://www.diet-studies.com>

Practical experience

For the past 30 years the Feingold Diet has played an essential part in successfully helping students to improve their academic achievement. Here are the stories of some of these children:

- On the Feingold diet, some of Sadie's test scores rose dramatically. Reading went from the 32nd to the 83rd percentile. Vocabulary rose from the 6th to the 79th percentile. ¹⁹
- Keri had struggled with reading and faced the prospect of failing third grade, but after six days of eating real food she began steady progress in reading. ²⁰
- Despite an above average intelligence, Mark had stopped learning altogether. He began the Feingold diet in November and by the end of the school year he had brought his skills up to nearly grade level. ²¹
- Bryan, a child who seemed destined for failure, now has a Ph.D. and two books to his credit. ²²

- Ben was always in big trouble at school and his academic career looked bleak. He started using the Feingold Program when he was 7, and later graduated from the University of California Summa Cum Laude, with multiple awards for academic excellence.²³

Many schools today serve foodless foods

In recent years school foods have been further degraded by the addition of even more unhealthy additives and processing techniques, including excessive use of high fructose corn syrup, MSG, soy extenders and irradiation. The ingredients for a cheese quesadilla served by some schools would take an entire page to list.

Adding back missing nutrients

New studies have shown that in addition to serving healthier food, academic performance can be dramatically improved by the addition of essential fatty acids (EFAs), particular the omega-3 oils. These "good fats" have been removed from our foods through modern processing methods.

Researchers at Oxford University have shown that the addition of supplements containing omega-3 EFAs brought dramatic improvements. Children taking the EFAs made 10 months progress in reading skills in just 3 months.²⁴

One company has found a way to incorporate EFAs into a delicious soft serve ice cream; they provide it for children in inner city schools.

Better food for better performance

Changing school food does not need to be difficult or expensive; in fact, some schools have found they can provide better food for less than they had been spending on the inferior lunches.

As school administrators, you must be on the side of the children, and do what needs to be done - because if you don't, who will?

If our next generation looks like the red line below, how will we sleep at night?

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(processed food file)... images did not come through