

# Aspartame

## Aspartame, Brain Cancer and the FDA

There are a growing number of Clinicians and Scientists who are convinced that excitotoxins play a critical role in the development of several neurological disorders, including migraines, seizures, infections, abnormal neural development, certain endocrine disorders, specific types of obesity, and especially the neurodegenerative diseases; a group of diseases which includes: ALS, Parkinson's disease, Alzheimer's disease, Huntington's disease, and olivopontocerebellar degeneration. An enormous amount of both clinical and experimental evidence has accumulated over the past decade supporting this basic premise.

- In 1981, a researcher within the FDA was so concerned about data that pointed towards brain tumors caused by aspartame, that he stated he could not recommend its approval.

- Studies investigating aspartame's possible link to birth defects were cut off before completion because of "damaging information" about aspartame.

- Other studies about aspartame's effects on individuals with mood disorders were also stopped because of a dangerous increase of serious symptoms within the population being studied.

- Airline pilots have been warned against using aspartame in over twenty articles in various flight magazines including those published by the Air Force and the Navy. In fact, a hotline was set up for pilots to report adverse reactions to aspartame, and over 600 pilots reported experiencing seizures in the cockpit after using aspartame. How can the FDA ignore such data and continue to approve this toxic substance?

- In 1991, the FDA banned the import of the herbal sweetener stevia, and in the last few years resistance against stevia has surfaced in regulatory circles. It is estimated that stevia, which has been proven to be safe for human consumption, is a huge financial threat to the aspartame industry. Thus, it is very interesting that in 1992, shortly after this ban, the FDA approved widespread use of aspartame.

- There is also evidence that studies were falsified and misrepresented by G.D. Searle during the FDA pre-approval phase. Unfortunately, this is not uncommon in the world of FDA. Coincidentally, several high-ranking FDA officials that were involved in the ultimate approval of aspartame later moved into jobs with G.D. Searle or other companies linked to aspartame.

- Aspartame is the technical name for the brand names NutraSweet, Equal, Spoonful, and Equal-Measure.

Aspartame accounts for over 75 percent of the adverse reactions to food additives reported to the FDA. A few of the 90 different documented symptoms listed in the report as being caused by aspartame include: Headaches/migraines, dizziness, seizures, nausea, numbness, muscle spasms, weight gain, rashes, depression, fatigue, irritability, tachycardia, insomnia, vision problems, hearing loss, heart palpitations, breathing difficulties, anxiety attacks, slurred speech, loss of taste, tinnitus, vertigo, memory loss, and joint pain.

According to researchers and physicians studying the adverse effects of aspartame, the following chronic illnesses can be triggered or worsened by ingesting of aspartame: Brain tumors, multiple sclerosis, epilepsy, chronic fatigue syndrome, Parkinson's disease, Alzheimer's, mental retardation, lymphoma, birth defects, fibromyalgia, and diabetes.

Aspartic acid, which makes up 40% of aspartame, acts as a transmitter for neurons in the brain. In effect, it alters the transmissions and allows free radicals to enter the brain and kill the neural cells. These are referred to as "excitotoxins" because they stimulate the neural cells to death.

Phenylalanine, which makes up 50% of aspartame, is an amino acid normally found in the brain. There are certain people with a genetic disorder called phenylketonuria (PKU) that cannot properly process Phenylalanine, which builds up to toxic levels in the brain. Researchers have discovered that aspartame, especially when consumed with carbohydrates, causes people without PKU to develop toxic levels of phenylalanine in the brain. This commonly leads to emotional disorders such as depression.

- With Permission from Dr. Russell Blaylock, MD.

[http://www.google.ca/url?q=http://www.youtube.com/watch%3Fv%3DlqIFDoOwSFM&ei=rMprSp-hJpXENtqQ6fgG&sa=X&oi=video\\_result&resnum=2&ct=thumbnail&usg=AFQjCNFBQqtTc7qIHf32wltJbnUNJmGi2A](http://www.google.ca/url?q=http://www.youtube.com/watch%3Fv%3DlqIFDoOwSFM&ei=rMprSp-hJpXENtqQ6fgG&sa=X&oi=video_result&resnum=2&ct=thumbnail&usg=AFQjCNFBQqtTc7qIHf32wltJbnUNJmGi2A)

- The Dangers of Aspartame (Artificial Sweeteners )... (Video)

Yet, the FDA still refuses to recognize the immediate and long term danger to the public caused by the practice of

allowing various excitotoxins to be added to the food supply, such as MSG, hydrolyzed vegetable protein, and aspartame. The amount of these neurotoxins added to our food has increased enormously since their first introduction. For example, since 1948 the amount of MSG added to foods has doubled every decade. By 1972, 262,000 metric tons were being added to foods. Over 800 million pounds of aspartame have been consumed in various products since it was first approved. Ironically, these food additives have nothing to do with preserving food or protecting its integrity. They are all used to alter the taste of food. MSG, hydrolyzed vegetable protein, and natural flavoring are used to enhance the taste of food so that it tastes better. Aspartame is an artificial sweetener.

The public must be made aware that these toxins (excitotoxins) are not present in just a few foods but rather in almost all processed foods. In many cases they are being added in disguised forms, such as natural flavoring, spices, yeast extract, textured protein, soy protein extract, etc. Experimentally, we know that when subtoxic (below toxic levels) of excitotoxins are given to animals, they experience full toxicity. Also, liquid forms of excitotoxins, as occurs in soups, gravies and diet soft drinks are more toxic than that added to solid foods. This is because they are more rapidly absorbed and reach higher blood levels.

So, what is an excitotoxin? These are substances, usually amino acids, that react with specialized receptors in the brain in such a way as to lead to destruction of certain types of brain cells. Glutamate is one of the more commonly known excitotoxins. MSG is the sodium salt of glutamate. This amino acid is a normal neurotransmitter in the brain. In fact, it is the most commonly used neurotransmitter by the brain. Defenders of MSG and aspartame use, usually say: How could a substance that is used normally by the brain cause harm? This is because, glutamate, as a neurotransmitter, is used by the brain only in very, very small concentrations - no more than 8 to 12ug. When the concentration of this transmitter rises above this level the neurons begin to fire abnormally. At higher concentrations, the cells undergo a specialized process of cell death.

The brain has several elaborate mechanisms to prevent accumulation of MSG in the brain. First is the blood-brain barrier, a system that impedes glutamate entry into the area of the brain cells. But, this system was intended to protect the brain against occasional elevation of glutamate of a moderate degree, as would be found with un-processed food consumption. It was not designed to eliminate very high concentrations of glutamate and aspartate consumed daily, several times a day, as we see in modern society. Several experiments have demonstrated that under such conditions, glutamate can by-pass this barrier system and enter the brain in toxic concentrations. In fact, there is some evidence that it may actually be concentrated within the brain with prolonged exposures. There are also several conditions under which the blood-brain barrier (BBB) is made incompetent. Before birth, the BBB is incompetent and will allow glutamate to enter the brain. It may be that for a considerable period after birth the barrier may also incompletely developed as well. Hypertension, diabetes, head trauma, brain tumors, strokes, certain drugs, Alzheimer's disease, vitamin and mineral deficiencies, severe hypoglycemia, heat stroke, electromagnetic radiation, ionizing radiation, multiple sclerosis, and certain infections can all cause the barrier to fail. In fact, as we age the barrier system becomes more porous, allowing excitotoxins in the blood to enter the brain. So there are numerous instances under which excitotoxin food additives can enter and damage the brain.

Finally, recent experiments have shown that glutamate and aspartate (as in aspartame) can open the barrier itself. Another system used to protect the brain against environmental excitotoxins, is a system within the brain that binds the glutamate molecule (called the glutamate transporter) and transports it to a special storage cell (the astrocyte) within a fraction of a second after it is used as a neurotransmitter. This system can be overwhelmed by high intakes of MSG, aspartame and other food excitotoxins. It is also known that excitotoxins themselves can cause the generation of numerous amounts of free radicals and that during the process of lipid peroxidation (oxidation of membrane fats) a substance is produced called 4-hydroxynonenal. This chemical inhibits the glutamate transporter, thus allowing glutamate to accumulate in the brain. Excitotoxins destroy neurons partly by stimulating the generation of large numbers of free radicals. Recently, it has been shown that this occurs not only within the brain, but also within other tissues and organs as well (liver and red blood cells). This could, from all available evidence, increase all sorts of degenerative diseases such as arthritis, coronary heart disease, and atherosclerosis, as well as induce cancer formation. Certainly, we would not want to do something that would significantly increase free radical production in the body. It is known that all of the neurodegenerative disease, such as Parkinson's disease, Alzheimer's disease, and ALS, are associated with free radical injury of the nervous system.

It should also be appreciated that the effects of excitotoxin food additives generally are not dramatic. Some individuals may be especially sensitive and develop severe symptoms and even sudden death from cardiac irritability, but in most instances the effects are subtle and develop over a long period of time. While MSG and aspartame are probably not causes of the neurodegenerative diseases, such as Alzheimer's dementia, Parkinson's disease, or amyotrophic lateral sclerosis, they may well precipitate these disorders and certainly worsen their effects. It may be that many people with a propensity for developing one of these diseases would never develop a full blown disorder had it not been for their exposure to high levels of food borne excitotoxin additives. Some may have had a very mild form of the disease had it not been for the exposure.

In July, 1995, the Federation of American Societies for Experimental Biology (FASEB) conducted a definitive study for the FDA on the question of safety of MSG. The FDA wrote a very deceptive summary of the report in which they implied

that, except possibly for asthma patients, MSG was found to be safe by the FASEB reviewers. But, in fact, that is not what the report said at all. I summarized, in detail, my criticism of this widely reported FDA deception in the revised paperback edition of my book, *Excitotoxins: The Taste That Kills*, by analyzing exactly what the report said, and failed to say. For example, it never said that MSG did not aggravate neurodegenerative diseases. What they said was, there were no studies indicating such a link. Specifically, that no one has conducted any studies, positive or negative, to see if there is a link. In other words it has not been looked at. A vital difference.

Unfortunately, for the consumer, the corporate food processors not only continue to add MSG to our foods but they have gone to great lengths to disguise these harmful additives. For example, they use such names as hydrolyzed vegetable protein, vegetable protein, hydrolyzed plant protein, caseinate, yeast extract, and natural flavoring. We know experimentally, as stated, when these excitotoxin taste enhancers are added together they become much more toxic. In fact, excitotoxins in subtoxic concentrations can be fully toxic to specialized brain cells when used in combination.

Frequently, I see processed foods on supermarket shelves, especially frozen or diet food, that contain two, three or even four types of excitotoxins. We also know that excitotoxins in a liquid form are much more toxic than solid forms because they are rapidly absorbed and attain high concentration in the blood. This means that many of the commercial soups, sauces, and gravies containing MSG are very dangerous to nervous system health, and should especially be avoided by those either having one of the above mentioned disorders, or are at a high risk of developing one of them. They should also be avoided by cancer patients and those at high risk for cancer.

In the case of ALS, amyotrophic lateral sclerosis, we know that consumption of red meats and especially MSG itself, can significantly elevate blood glutamate, much higher than is seen in the normal population. Similar studies, as far as I am aware, have not been conducted in patients with Alzheimer's disease or Parkinson's disease. But, as a general rule I would certainly suggest that persons with either of these diseases avoid MSG containing foods as well as red meats, cheeses, and pureed tomatoes, all of which are known to have high levels of glutamate. It must be remembered that it is the glutamate molecule that is toxic in MSG (monosodium glutamate). Glutamate is a naturally occurring amino acid found in varying concentrations in many foods. Defenders of MSG safety allude to this fact in their defense. But, it is free glutamate that is the culprit. Bound glutamate, found naturally in foods, is less dangerous because it is slowly broken down and absorbed by the gut, so that it can be utilized by the tissues, especially muscle, before toxic concentrations can build up. Therefore, a whole tomato is safer than a pureed tomato. The only exception to this, based on present knowledge, is in the case of ALS. Also, in the case of tomatoes, the plant contains several powerful antioxidants known to block glutamate toxicity.

Hydrolyzed vegetable protein should not be confused with hydrolyzed vegetable oil. The oil does not contain appreciable concentration of glutamate, it is an oil. Hydrolyzed vegetable protein is made by a chemical process that breaks down the vegetable's protein structure to purposefully free the glutamate, as well as aspartate, another excitotoxin. This brown powdery substance is used to enhance the flavor of foods, especially meat dishes, soups, and sauces. Despite the fact that some health food manufacturers have attempted to sell the idea that this flavor enhancer is "all natural" and "safe" because it is made from vegetables, it is not. It is the same substance added to processed foods. Experimentally, one can produce the same brain lesions using hydrolyzed vegetable protein as by using MSG or aspartate. A growing list of excitotoxins is being discovered, including several that are found naturally. For example, L-cysteine is a very powerful excitotoxin. Recently, it has been added to certain bread dough and is sold in health food stores as a supplement. Homocysteine, a metabolic derivative, is also an excitotoxin. Interestingly, elevated blood levels of homocysteine has recently been shown to be a major, if not the major, indicator of cardiovascular disease and stroke. Equally interesting, is the finding that elevated levels have also been implicated in neurodevelopmental disorders, especially anencephaly and spinal dysraphism (neural tube defects). It is thought that this is the protective mechanism of action of the prenatal vitamins B12, B6, and folate when used in combination. It remains to be seen if the toxic effect is excitatory or by some other mechanism. If it is excitatory, then unborn infants would be endangered as well by glutamate, aspartate (part of the aspartame molecule), and the other excitotoxins. Recently, several studies have been done in which it was found that all Alzheimer's patients examined had elevated levels of homocysteine. Recent studies have shown that persons affected by Alzheimer's disease also have widespread destruction of their retinal ganglion cells. Interestingly, this is the area found to be affected when Lucas and Newhouse first discovered the excitotoxicity of MSG. While this does not prove that dietary glutamate and other excitotoxins cause or aggravate Alzheimer's disease, it makes one very suspicious. One could argue a common intrinsic etiology for central nervous system neuronal damage and retinal ganglion cell damage, but these findings are disconcerting enough to warrant further investigations.

Written by Dr. Russell L. Blaylock, MD and adapted from: *"Excitotoxins: The Taste That Kills"* (264 pp., \$27.00, ISBN: 0-929173-14-7, Santa Fe, NM, Health Press, 1994)