

The effects of preservatives and chemicals in food biology essay



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There are preservatives and other chemical additives in most grocery store food products, whether during processing, packaging or storing. Some additives are natural, like salt or sugar, but some are not. All substances we ingest have an effect upon our bodies. What are the effects of these chemicals additives on humans, on children, and on unborn babies? There are many effects that these preservatives have, every time we absorb these chemicals our life span decreases.

“ Additives have been used for centuries as a preservative, in processes like smoking, pickling or salting food. Preservatives are additives that inhibit the growth of bacteria” (Kunkel and Luccia). Other substances often seen on food labels and used in food preservation are antimicrobials such as calcium propionate and ascorbic acid. Antimicrobials stop spoiling by molds and other micro-organisms. Antioxidents, such as Vitamin C and butylated hydroxytoluene (BHT) prevent rancidity and spoiling due to oxygen exposure. Chelating agents such as citric acid also prevent rancidity (Kunkel, “ Additives and Preservatives”).

Artificial colors are added to foods to make them more appealing to humans, such as the red to maraschino cherries. Artificial flavors and flavor enhancers are the largest class of additives, and can be natural (like sugar) or synthetic (like MSG.) Bleaching agents such as peroxide are added to flour and cheese to whiten them. Thickening and stabilizing agents are added to foods to change their textures, such as lecithin in salad dressings and carrageen in ice cream. Nutrients, like Vitamin D and niacin, can be added to foods to enhance their nutritional value (Kunkel, “ Additives and Preservatives”)

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In the United States, the Food and Drug Administration (FDA) must approve all additives based on scientific findings such as their safety before they are sold to the public. As of 1996, the FDA is supposed to monitor all foods and additives relative to their risk of causing cancer. However, foods such as red dye #3, which has been shown to cause cancer, and MSG, which is acknowledged to trigger asthma and headaches, are still allowed to be used with some restrictions. The FDA does not required detailed disclosure of flavor additives, as they are regarded as "GRAS;" or "Generally Regarded as Safe" and restaurants are not obligated to disclose any additives in foods served (Kunkel," Additives and Preservatives")

There are many cases in which approved additives were thought to be safe, but were later restricted or banned after being proven harmful; cyclamate, widely used in the 1950s and 1960s, was banned by the FDA in 1970 after research suggested that it caused cancer. Violet No. 1 was used by the USDA to stamp inspection grades on beef until banned by the FDA as a known carcinogens. After years of use, a flavoring called Safrole that was used in root beer, as well as the common preservative BHA, were both found to cause cancer (Kunkel," Additives an Preservatives") Although the FDA allows such additives as red dye #3 in limited use, there is little or no research on the cumulative effects of repeated ingestion of such additives over many years, and if they are excreted or stored in the body (" Eat, Taste, Heal").

There is no doubt that food additives confer many benefits, such as providing an large amount of food that is able to be distributed all over the world, preventing many diseases such as scurvy and malnutrition. Especially in the United States, all sorts of foods that would have been absolutely

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unavailable for consumption are commonplace, providing consumers with an exciting array of food choices all year round, regardless of where they live (Kunkel, " Additives and Preservatives") In the United States, over 3000 food additives are approved for use; in some European countries less than 20 additives are allowed (" Eat, Taste, Heal").

There are many other effects of food additives. Bateman et al (1989) conducted a study which showed hyperactivity among preschool children from artificial food coloring and benzoate preservatives. These findings were echoed in a study by McCann et al (2007) which also showed significant increases in hyperactivity in 3 year olds and 8-9 year olds who were given artificial food coloring and sodium benzoate in soft drinks. Dr. Blaylock (1999) details scientific findings which link " excitotoxin taste enhancers" such as MSG, hydrolyzed vegetable protein and aspartate to Amyotrophic lateral sclerosis (ALS), Parkinson's and Alzheimer's diseases. He also describes the immature brain as being four times more vulnerable to excitotoxins than the mature brain, and advises pregnant woman to avoid ingesting any excitotoxins, explaining that early effects to the child include endocrine dysfunction and disruptions to complex learning. This author's research was unable to conclude whether MSG crosses the placenta or not, and if a pregnant woman would pass it to their fetus. All websites visited advised pregnant women not to eat any, although few stated that it would definitely cause harm.

High fructose corn syrup (HFCS) is a very controversial food additive which is part of many widely available drinks, candies, dairy products, baked goods and syrups. HFCS is linked to diseases including obesity, accelerated aging, <https://assignbuster.com/the-effects-of-preservatives-and-chemicals-in-food-biology-essay/>

diabetes mellitus, fatty liver, increased triglycerides, increased uric acid, chronic diarrhea, irritable bowel syndrome and hives (Gonan, " Food Additives") Notably, there have been several commercials on television in the last year in which young people state that HCFS is perfectly safe and delicious to eat.

Television and other media have a huge influence on how and what the public eats. The commercials are produced by food companies which might be assumed to be more interested in making profit than the public's health. In " Fast Food Nation," Eric Schollosser (2001) describes the impact of big business on the dietary health and agriculture of the United States, which has caused an epidemic of obesity. Typically, a fast food product contains an array of at least 50 flavor additives alone; only a chemist could have any idea of what they were actually eating. Schlosser described how one color additive, carmine, is made from the desiccated bodies of a Peruvian beetle. Carmine is used to color foods like yogurt and strawberry milkshakes. A simple Goggle search on " the adverse effects of inactive ingredients" results in a list of food colorings with effects such as angioedema, dermatitis, tumors, and urticaria (" Adverse Effect of " Inactive" Ingredients") Potatoes are coated with the chemical inhibitor, maleic hydrazide, which prevents sprouting, but which has resulted in cancer in laboratory animals (Epstein et al, " Carcinogenicity of the Herbicide Maleic Hydrazide") The industry loads fat, sugar and salt into their products because they are cheap, and use chemicals to change these cheap, raw materials into brightly-colored, tasty products with a long shelf life. In the 2004 film " Supersize Me" Morgan Spurlock attempted to document the popular claim that McDonald's food is

unhealthy by eating it exclusively for one month. In the process, he gains 25 lbs., becomes depressed and suffers from palpitations and heart disease. After the movie was released, McDonalds's eliminated the "Supersized" option and added more salads and "healthy" options to their menu.

Many common foods available in supermarkets have been treated with strong doses of radiation, in order to make them last longer, in part by killing off bacteria and viruses which speed decay (Seah, "Food Irradiation - an invisible threat.") These doses are from 5,000 to 1 million rads for vegetables, meats, fish, fruits and grains, and up to 3 million for spices. To put that in perspective, one x-ray for humans is usually about 0.01 rads, a very weak dosage so as not to damage cells and cause cancer. These irradiated foods are required by the Food and Drug Administration to be labeled as "Treated with Irradiation" in shipping and stores, but are not required to be labeled when sold in restaurants (EPA) Studies on the effects of irradiated food on human health have been inconclusive and very controversial. Proponents against irradiation of foods point to the nuclear industry as having a very strong influence on research, with several large studies done by such companies having been convicted of fraudulent research (Seah, "Food Irradiation - an invisible threat.") In the verbatim extracts from the 1987 U. S. Congressional Hearings Into Food Irradiation, a study was repeatedly cited which had concluded that irradiated wheat caused abnormal cells in rats, mice, monkeys and undernourished children, as well as causing stillbirths in rat litters and poor weight gain among all the subjects, indicating that the radiation had reduced the wheat's nutritional value ("Potential Health Hazards of Food".)

No discussion of food additives would be complete without mentioning genetic modification of foods. Genetic modification is a process in which scientific technology has been used to combine genes of different organisms to produce an entirely new or genetically modified organism. This is done for plants and other food sources to create crops and animals that are more resistant to insects, disease or extreme weather, or simply to create products which are more nutritious, delicious or interesting. These products also pose some risks to human health, and are quite controversial relative to safety and ethics issues, for instance when animal genes are combined with plants. Opponents complain that there is no substantive or long term testing of these “ transgenic” foods before they are fed to the unsuspecting public. So far, there is no required labeling for genetically modified foods in the United States. (“ Human Genome Project Information”)

Many consumers look towards the organic food section for foods which are pure, nutritious, and free of added chemicals, genetic modification or irradiation. Organic foods are those produced using methods that do not involve pesticides or chemical fertilizers, do not contain genetically modified organisms, and are not processed using irradiation, industrial solvents, or most chemical food additives. In order to be labeled “ organic,” the food producers have to be specially certified. There are three categories of organic food labeling; Products made entirely with certified organic ingredients and methods can be labeled “ 100% organic”. Products with at least 95% organic ingredients can use the word “ organic”. Both of these categories may also display the USDA organic seal. A third category,

containing a minimum of 70% organic ingredients, can be labeled “ made with organic ingredients” (“ Organic Certification”).

In conclusion, it only seems sensible to avoid foods with additives as much as possible, and to limit or eliminate consumption of fast foods. There is really no way for a consumer to know all the additives included in their foods, or in foods served in most restaurants. The only way a consumer can be relatively well assured that they are not eating unknown additives is to buy fresh, unprocessed local food from farmers who you know haven't used harmful pesticides or additives, or to grow your own food. However, life is full of compromise, and a discerning consumer will scrutinize labels and be wise enough to be alert to the potential harm of processed foods while shopping and eating outside of the home.

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