

## A Review on Hazardous Chemicals Present in Junk Food

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**Abstract:** *Junk food may be defined as any food which is low in nutrients (protein, vitamin, fibers) and high in everything else (salt, sugar, fat, energy). It is a food which is easy to cook and serve, after dissolving or dispersing in a liquid. Junk food is becoming widely popular nowadays among youths due to ready availability, taste, and low cost. Foods such as chips, chocolate, ice-cream, soft drinks, pizzas, burgers, and many others in the category of junk food. Mc Donald's and Burger King are not only fast food industries invading our communities, our minds, and our stomachs but also our health. Taco Bell, Pizza hut, Kentucky Fried chicken are also few others. These industries are successful because they offer consumers a quick, cheap, convenient, and tasty meal that is all too often high in fat and salt content and low in fiber and calcium. Junk food contains many hazardous chemicals. Many junk foods also have trans fats. Various chemicals are being used in junk food like PhIP (2-amino-1-methyl-6-phenylimidazo [4,5-b] pyridine), a chemical that appears in grilled chicken, MSG (Monosodium glutamate), PAPs (polyfluoroalkyl phosphate esters), caramel coloring, sodium nitrite, and sodium nitrate, BHA (Butylated hydroxyanisole), tartrazine and other food dyes that are hazardous for health.*

**Keywords:** Hazardous chemicals; junk food; harmful effects

### 1. Introduction

A lot of changes have occurred in lifestyle in the present time. Food is any substance that is eaten and drunk to provide nutritional support to the body [1]. Initially, food used to be obtained from hunting, farming, ranching but in the present scenario many foods are not obtained from animal and plant sources [2]. The modern diet which can be classified as “high intake of saturated and omega-6 fatty acids, reduced omega-3 fat intake, excess use of salt and refined sugar 1”, has gained a lot of attention due to the continuous increase in various diseases. Many people already know, excess eating of such type of food can cause damage to the heart, kidney, and waistlines as well as the immune system [2].

Junk food is the term that can be used for all those foods which are low in nutrition. The term “junk food” was first coined in 1972 by Michael Jacobson, Director of the Center for Science in the public interest [1]. Junk food is much more harmful to health as we used to think. There are many other chemicals also which are present in junk food. Although the craze for junk food is increasing in society yet it should be avoided. People need to be aware of their health and should avoid junk food. Instead of this junk food, one should involve more and more fruits and vegetables in their diet because fruits and vegetables contain enough nutrients like proteins, vitamins, and fibers. And they are easy to digest. Even all these foods named as ‘junk’ can be cooked in homes without using any chemicals, which will be healthier for people and growing children. A 2008 report suggests that mothers who eat junk food while pregnant or breastfeeding have children who are more prone to obesity [1]. A recent report suggests that pregnant mothers who eat high sugar and high-fat diets have babies who are likely to become junk food junkies themselves, this happens because the high fat and high sugar diet lead to changes in the fetal brain's reward pathway, altering food preferences [3].

Many times, such foods usually do not pose any immediate health concerns and are generally safe when integrated into a well-balanced diet. Most of us think of fast food as a recent phenomenon connected with the rise of modernism and contemporary culture. The truth is the origins of cheap, readily available food, date back a long way and fast food didn't always get a bad reputation as it does now. Junk food started from those people who had a reason to be away from home. Although McDonald's was the first restaurant in the line of a fast-food chain, White Castle is also considered as the first fast-food chain. White castle was founded in 1921 in Wichita, Kansas. The McDonald brothers opened their redesigned restaurant in 1948 and several fast-food chains that exist today opened soon after. As time passed, junk food started to become hazardous due to the presence of chemicals in that.

## **2. Chemicals present in Junk food that are harmful to health**

There are a lot of chemicals present in junk food that can be harmful to human health. Some common chemicals that are hazardous to health have been discussed here and the figures of some of the chemicals are represented here in figure 1.

### **1.1. Monosodium Glutamate (MSG)**

It is the sodium salt of glutamic acid, one of the most abundant naturally occurring non-essential amino acids. It is a flavor enhancer that is commonly added to Chinese food, canned vegetables, soup, and processed meats. This chemical has been classified as a dangerous food ingredient by the Food and Drug Administration (FDA). The excess use of MSG is associated with conjunction symptoms and burning sensation<sup>48</sup>. It can cause severe headaches and asthma in some individuals [1].

### **1.2. Sulphites**

It is used in dried fruits, fruit juices and syrups, fruits based dairy desserts, beer, and wine. It is found to cause pruritus, urticaria, angioedema, and asthma [2, 4-6]. The experiments on animals show that it shows mutagenic action [1].

### **1.3. Caramels**

It is found in several fast foods, from cakes and sauces to sodas. Almost, more than 100 formulations are prepared by using this. Two of its ingredients are 2-methylimidazole and 4-methylimidazole. A study conducted on rabbits confirmed that a small dose of ammoniated caramels can inhibit the absorption of vitamin B6[4].

### **1.4. Sodium Nitrite and Sodium Nitrate**

These chemicals are present in each bite of junk foods like hot dog, bacon, sausage, and hamburger as preservatives and coloring agents. All junk food appears grey instead of red without these chemicals. Both these chemicals further break down into nitrosamines, substances that cause cancer. Consumption of these chemicals can cause headaches, cancer in animals, and humans both [5].

### **1.5. Butylated hydroxyanisole (BHA)**

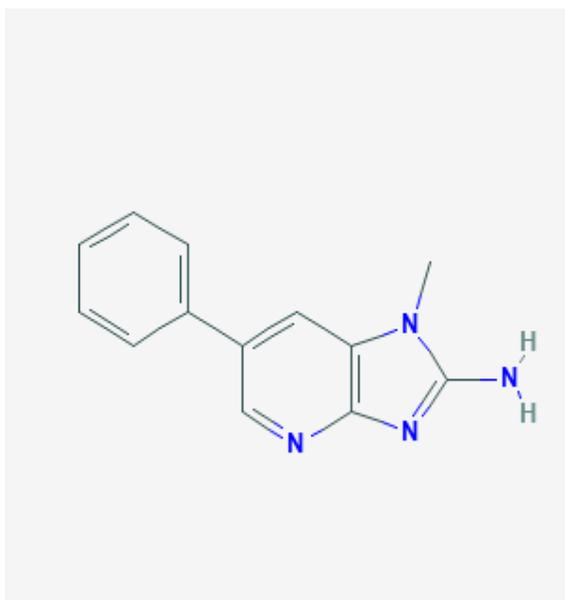
BHA is used as an antioxidant. It is used to preserve cereals, chewing gum and potato chips, butter, nuts, and vegetable oil. According to the National Institute of Health, BHA is anticipated as a human carcinogen. There is another antioxidant also known as BHT (butylated hydroxytoluene). This chemical is considered safe and carcinogenically less harmful in comparison to BHT. BHT is used as a replacement for BHA. A study conducted on rats showed that BHA was found to be tumor producing. And in humans, it was found to be linked with urticarial, angioedema, and asthma [6].

### 1.6. Tartrazine

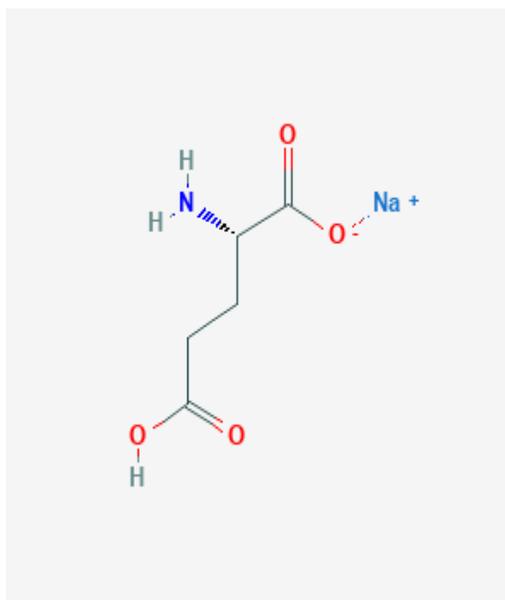
Most of the junk food contains color. In macaroni and cheese products, dye naming yellow no. 5 (tartrazine) and no. 6 were used, but Kraft announced, the removal of these dyes. There are many other dyes also e.g. Blue 1, Green 3, Red 40 that are found in candy, beverages, and baked items. Most of the soft drink industry uses Tartrazine [7-11]. The adverse effect of tartrazine can be seen on those who are more sensitive to acetylsalicylic acid (ASA).

### 1.7. Ponceau

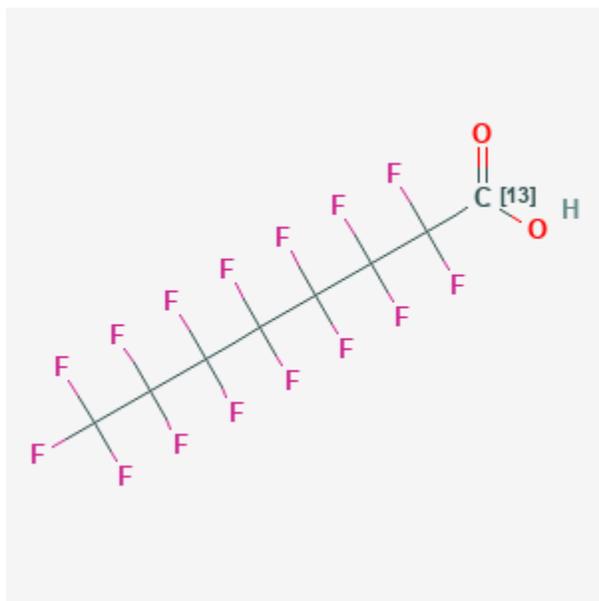
This is generally added to dessert mixes. And it is found to exhibit a weak carcinogenic activity [8].



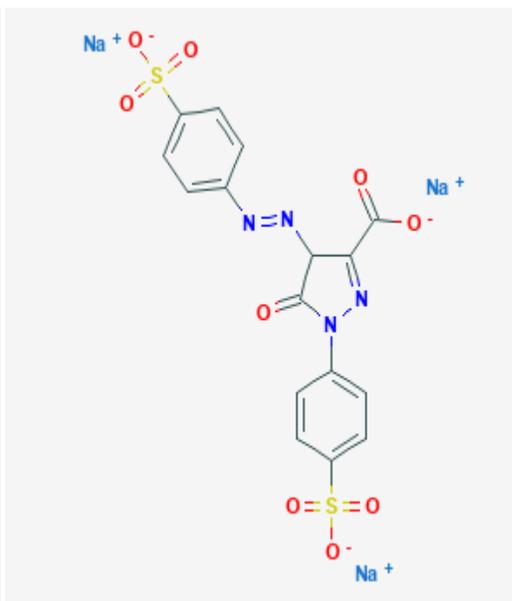
**PHIP**



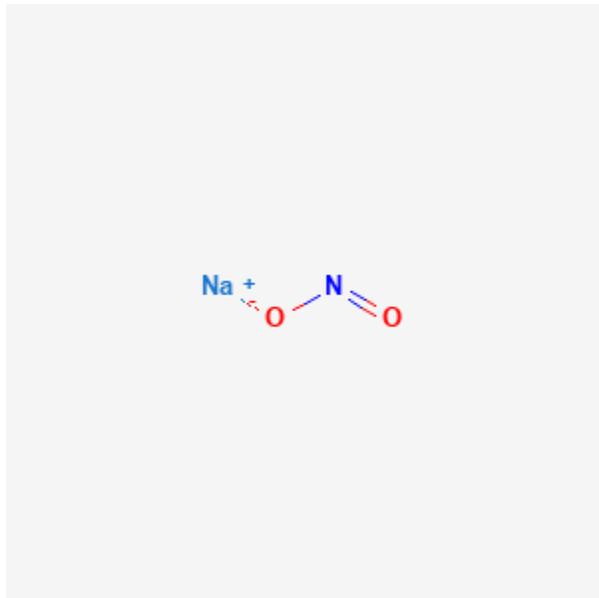
**MSG**



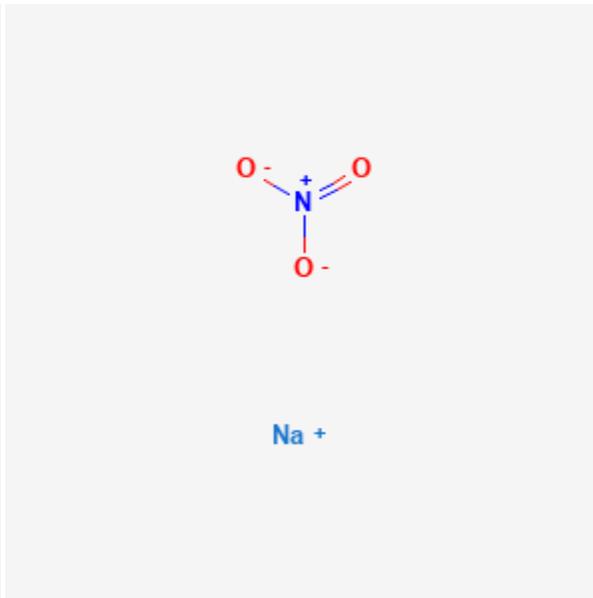
**Perfluorooctanoic Acid**



**Tartrazine**



**Nitrite**



**Nitrate**

**Figure 1. Representation of some hazardous chemicals present in junk food[12]**

### 3. Effects of these chemicals present in junk food in human health

There are a lot of harmful effects on the human body due to the presence of chemicals in junk food. Some of the effects are discussed here. One of the well-known harmful effects of consuming junk food is obesity. An intake of an excessive amount of junk food makes a person addicted to it. Various studies show that intake of high salt in the diet can also increase IL-17- mediated inflammation and also worsen the autoimmune disease [13, 14].

Foods and drinks are loaded with carbohydrates and calories nowadays. Continuous consumption of carbohydrates can increase the blood sugar level resulting in type 2 diabetes [15, 16].

Excess consumption of junk food may result in cardiovascular diseases. Intake of excess amounts of sodium may result in kidney stones, kidney diseases, and stomach cancer [17]. Due to the consumption of junk food, the respiratory system, and central nervous systems are also affected [16]. Along with this, continuous use of such type of food may also affect skin and bones, it can cause acne, eczema in children. Excess consumption of sodium may also result in the development of osteoporosis [6].

Food colorings used in junk food give color and a tasty look to food. The chemicals of these food colors are the byproducts of coal tar and other hazardous chemicals which is responsible for the growth of certain cancers.

Excessive eating of fast food leads to the early development of hypertension, dyslipidemia, impaired glucose tolerance, and risk of future heart disease. Fast food contains low micronutrient content such as carotene, vitamin A, vitamin C, calcium, and magnesium which can lead to osteoporosis. Diet with high sugar can damage the enamel of teeth. The high salt content in fast food increases the risk of high blood pressure strokes, and kidney problems [18].

### 4. Conclusion

The quality of junk food is deteriorating regularly from time to time. A lot of chemicals are present in junk food. Although the craziness towards junk food is increasing continuously in society, yet it should be avoided to maintain good health. People need to be aware of their health. Rather than consuming such type of food, one should consume more and more fruits and vegetables in one's diet as fruits and vegetables contain plenty of nutrients like proteins, vitamins, and fibers and they are easy to digest. All the governing organizations should make sure that all the outlets, restaurants, or stores serving these junk foods should involve the nutrition value and the information about the chemicals being used. Finally, the authors can conclude by saying that avoiding junk food can save people from a lot of diseases and they will spend a healthy and long life.

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