

Unveiling the Hidden Ingredients: Exploring the Menace of Food Adulteration

Aditi Gupta

Scholar, BA. LLB. from Uttaranchal University, Law College Dehradun

Email: [aditigupta0064\[at\]gmail.com](mailto:aditigupta0064[at]gmail.com)

Abstract: “Healthy citizens are the greatest asset any country can have.” As stated by Winston Churchill. Food is the most basic necessity for human survival, however the majority of the foods we eat are adulterated or fraudulently produced. Adulterants are any substances that could make food unhealthy due to the presence of extraneous stuff. Food adulteration is the practice of putting inferior or impurity ingredients into food items, which lowers the food’s quality. Food adulteration has a long history in human culture, is still a problem now, and is obviously very dangerous for our health. It has persisted in modern times and has happened since the beginning of time. Several foods, including milk and beef, are known to be adulterated both domestically and internationally. Adulterants are substances that are purposefully made by people, primarily for financial gain. In addition to causing diseases, these adulterants can have toxic or cancerous effects. This article focuses on the review of food adulterants, their potentially harmful effects on human health, and the measures implemented to curtail food adulteration.

Keywords: Food Adulteration, adulterants, food fraud, health, injurious, prevention, safety and standard.

1. Introduction

In today’s fast - paced world, concerns about the safety and authenticity of the food and supplements we consume have become increasingly prevalent. Every living organism eat food to gain energy for different metabolic activity. Food is an organic and essential substance consumed by the human being for bodily energy, posture and growth of the human organs but human beings have adulterated the food and supplements for their financial gain. For instance, you may have seen that milk thins when combined with water, black stones in smoothies, and other ingredients. In a recent Supreme Court decision, Justices K. S. Radhakrishnan and A. K. Sikri noted that selling milk that has been tainted with artificial substances is a crime that carries a life sentence. Diseases of the body as diarrhoea, nausea, allergies, diabetes, heart disease, and many more are brought on by this adulteration. Food adulteration is one of the man - made hazard caused by the human being to the human being. It describes the deliberate lowering of food quality by the addition or subtraction of valuable ingredients, the substitution of unreported substitutes, or both. Usually, this is done to enhance the quantity or decrease the cost of a task completed by a human being in order to benefit financially. The consumer must choose good quality over low price quality. Such food had been severely prone to adulteration due to high possessing dietary value and vast popularity. Foods having low margin value are frequently adulterated. Adding injections and colorants for their attractive appearance are included in food adulteration. Microbiological, chemical, and physical risks might inadvertently find their way into our food due to human ignorance or carelessness, leading to food - borne illnesses and even fatalities. In the case of **Ram Dayal And Ors. V. Emperor (1923)**¹, the accused was selling ghee with a mixture of pig fat. The Privy Council held that the mixing of pig fat with the ghee is noxious to the religious feelings of the Hindus and Mohammedans but it would not come under

the expression ‘noxious as food’. Noxious includes ‘unwholesomeness or injurious to health but not repugnant to one’s feeling’².

In Nestle India Limited v. The Food Safety and Standards Authority of India (2015) (the Maggi Case)³.

In this, the petitioner - company was ordered to stop the manufacturing, distribution, etc of the 9 types of a variant of products of noodles manufactured by the company. The court expressed that the principle of natural justice was not followed. The company, a day prior to the impugned order, recalled all the products till the authorities were satisfied with the safety of the product. And it was also realized that the laboratories where the products were tested for high quantities of lead, were not accredited and recognized under the Act, and relying on their test result would not be justified. Some of the common adulterants with their harmful side effects are stated below:

- 1) Milk is adulterated with water, urea causing vomiting and food poisoning.
- 2) Wheat and other food grains adulterated with dust, pebbles, stone, weed seeds causing liver disorders, toxicity in the body.
- 3) Honey is adulterated with Molasses sugar causing blood disorder and liver infection.

2. Reasons for Food Adulteration

Following are some reasons for food adulteration including:

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- 1) Economic Gain: Adulteration of food with cheaper substances provides producers in increase of profits by reducing production costs.

² Saumya Sinha ; Laws for the Prevention of Food Adulteration in India; iPleaders(October 15,2018) ; <https://blog.ipleaders.in/food-adulteration-laws-in-india/#:~:text=The%20adulteration%20of%20food%20is,in%20trade%20between%20different%20provinces>

³ Nestle India Limited v. The Food Safety and Standards Authority of India (2015), AIR 2016 (NOC) 225 (BOM.), 2015 (6) ABR 74

¹ Ram Dayal and Ors vs Emperor(1923), 83IND. CAS.1004

- 2) Supply Shortages: During periods of scarcity or high demand, adulteration may occur which will provide low quality of product on higher rates than the actual. .
 - 3) Lack of Regulation: In areas with weak laws and regulations or enforcement, producers may adulterate food without any fear of repercussion.
 - 4) Extending Shelf Life: Preservatives and other additives are added to the products for their prolong shelf life of perishable food items without proper labeling.
 - 5) Toxic Substances: In some cases, unscrupulous producers may add toxic substances to the product to increase its quantity or alter its appearance, causing harmful effects to consumers.
 - 6) Ignorance or Negligence: Lack of awareness about food safety standards or negligence in adhering can also lead to unintentional food adulteration during production or processing.
- Impaired respiratory health: It's now increasingly usual for children and young people to add plastic to their food, which can lead to respiratory health problems. Asthma - causing plastic exposure is more common in packaged meals, processed chips, and other snacks. Not only can respiratory problems impact a person's nervous system.

Prevention of Food Adulteration

A thorough strategy involving numerous stakeholders is required to reduce food adulteration issues. The following measures can help prevent and mitigate the adulteration of food products:

Strengthening Laws and Enforcement:

- 1) Establish strict norms and standards for food safety legislation and implement them.
- 2) Provide a strong legal framework that enables audits, testing, and inspections along the whole food supply chain.
- 3) To guarantee adherence to safety regulations, conduct routine audits and inspection of food manufacturing and processing facilities⁶.

Improving Testing and Quantity Control:

- 1) Establish accredited, fully furnished labs to conduct comprehensive, on - going tests for food adulteration.
- 2) Enforce quality control protocols stringently throughout the whole food supply chain, from sourcing raw materials to processing, packaging, and delivery.
- 3) Promote the accurate and effective detection of adulterants through the application of cutting – edge technologies, such as spectroscopy and DNA testing.

Boosting Supply Chain Management:

- 1) Use technologies like batch tracking, bar - coding, and electronic documentation to encourage transparency and traceability in the food supply chain.
- 2) Encourage the application of Hazard Analysis and Critical Control Points (HACCP), Good Manufacturing Practices (GMP), and Good Agricultural Practices (GAP) systems to ensure the integrity of food production and processing.
- 3) Encourage cooperation and partnerships between distributors, retailers, suppliers, and producers in order to exchange best practices and guarantee adherence to quality standards.

Collaborative development of guidelines:

- 1) Diverse interest groups' participation in the creation of operational standards guarantees participation and a thorough approach.
- 2) To establish precise and enforceable standards that address important challenges in the food industry, stakeholders from the private sector, trade associations, consumer advocates, and pertinent government authorities must collaborate.
- 3) They should also stress how crucial it is to maintain responsibility, openness, and adherence to pertinent laws.⁷

Kinds of Food Adulteration: -

There are mainly 4 types by which adulteration is occurred are: -

- Intentional adulteration - Intentionally added or replacing to the product which makes debasing the quality as well as quantity of the original product for their financial gain. For example, pebbles in the pulses, chalk powder in milk.
- Accidental adulteration - Addition of the substance accidentally to the products while handling it is incidental or accidental adulteration.
- Metallic adulteration - Addition of metallic substance to the product such as lead and mercury which are hazardous in nature to the human health.
- Packaging adulteration - Packaging risks can arise from the interaction and mixing of food ingredients in the materials used to package the food.⁴

Effects of Food Adulteration:

Adulterated food might be responsible for mild to severe health impact containing higher level of toxic material which may cause diarrhea, nausea, allergy, diabetes, cardiovascular disease etc. are some common illness caused by food adulteration. Because they consume a lot of contaminated products, such soft drinks and packaged meals, children and teenagers are more likely to get these diseases as a result of their ignorance.

Long term harmful effect on children due to food adulteration includes: -

- Impaired gut health - Impaired gut health would undoubtedly result from consuming processed meals contaminated with substances like lead over an extended period of time. Wax is applied to apples these days to extend their shelf life, which might cause gastrointestinal issues. Recently, we learned from the media that a certain brand of instant noodles was tainted with lead, leading to a number of stomach problems like worms and altered gut flora. The media concentrated on a specific ingredient, monosodium glutamate (MSG), which was misrepresented.⁵

⁴ Unknown, Food Adulteration; Vedantu; <https://www.vedantu.com/biology/food-adulteration>

⁵ Ibid

⁶ Janvi Mehta; Prevention of Food Adulteration ; Legal Vidhya ; https://legalvidhiya.com/prevention-of-food-adulteration/#_ftn1

⁷ Id

Research and Development:

- 1) Research and development must be ongoing in order to support ethical business practices in the food industry.
- 2) Research collaborations between public and private organisations can concentrate on creating novel tools, techniques, and approaches to stop and identify food adulteration.
- 3) This could involve improvements in quality control procedures, traceability systems, and testing techniques.

Regulations Governing with Food Adulteration in India:

The rate of adulterated food has been rising daily. Over the past few years, India's rate of food adulteration has nearly doubled. It was 13% in India in 2011–12 and grew to 23% in 2016–17. A FSSAI survey on milk adulteration found that water is the most often used adulterant, accounting for about 70% of the milk that is contaminated. The survey revealed a startling finding: detergent was identified as one of the adulterants, posing a serious risk to human health.

The Constitution's Concurrent list includes food adulteration as one of its topics. Several state laws governing food quality existed before to 1954. But separate states had distinct laws, which made trading between provinces difficult. One could see the necessity for central legislation. throughout order to combat the widespread issue of food adulteration throughout the nation, the Union legislature passed the Prevention of Food Adulteration Act, 1954. This Act was in force until the Food Safety and Standard Act, 2006, revoked it. Along with it, the 2006 Act also repealed a number of orders, including the Meat Food Products Order of 1973, the Fruit Products Order of 1955, and the Milk and Milk Products Order of 1992.

Laws in force:

- 1) Indian Penal Code.
- 2) Prevention of Food Adulteration Act, 1954
- 3) Food Safety and Standards Act, 2006⁸

1) Indian Penal Code (1860) -

The adulteration of food or drink intended for sale is covered under section 272 of the Indian Penal Code (1860). This section states that anyone found to have adulterated food or drink with the intent to sell it as such, knowing that it is likely to be sold as such, faces up to six months in prison of any kind, a fine of up to one thousand rupees, or both⁹.

In the case of **M/S Pepsi Co India Holdings Private Limited and Anr. v. State Of U. P. (2010)**, Under Sections 272 and 273 of the IPC, the state government filed a formal complaint (FIR) against the company. The Pepsi Co India Holding contested this state action. Their principal argument was that the 2006 Act had eliminated sections 272 and 273 of the IPC. The entire topic of food adulteration and food safety is covered by the 2006 Act. The High Court believed that the 2006 Act should be used for the entire process and investigation, and that using an IPC clause would be inappropriate. The High Court of Allahabad concluded that the Indian Penal Code clause was inapplicable not this

situation by using the principle of *Generalia Specialibus Non Derogant*.

2) Prevention of Food Adulteration 1954: -

India - wide application of the Prevention of Food Adulteration Act 1954 began on June 15, 1955. Under the terms of this legislation, an item is only considered adulterated if it satisfies the vendor's criteria or if it contains any component that detracts from the article's quality.

- a) If the product was made or kept in an unclean environment.
- b) If the item includes any toxic or biologically incompatible materials, such as rotten, decayed, or putrid plant or animal matter, it should be avoided.
- c) If an unhealthy animal was used to make the item.
- d) If any harmful or toxic materials are present in the article
- e) If the article's container is composed of any harmful material.
- f) If coloring agents other than those listed in the prescription are applied to the material.
- g) If the article contains any illegal preservatives or more preservatives than what is recommended.
- h) Whether or not the article is harmful to health if its quality and purity do not match the committee's requirements.

Penalties

The vendor may be subject to fines for breaking any of the provisions under this act.

Here are a few that are listed below:

- 1) If the vendor breaks the law for the first time, they could face a fine of 2000 rupees or six months to a year in prison.
- 2) Vendors who break the legislation a second time face a maximum 6 - year prison sentence and termination of license.
- 3) The vendor must be prosecuted under Section 320 of the Penal Code if the contaminated food poses a risk to human health.

In a recent ruling, the defendant was operating a little kirana store in Delhi. When 450 grams of red chilli powder were taken from his shop in 1993, officials from the Food Adulteration Department discovered salt to be an adulterant. Ash content and evidence of adulteration were also revealed second test conducted by the Central Forensic Science Laboratory. A. K. Sikri and Justice B. S. Chauhan, who make up the Supreme Court bench, have condemned him to three months in prison under the Prevention of Food Adulteration Act, 1954.¹⁰

Food Safety and Standards Act, 2006:

The Act became operational in 2011. New Delhi is home to the FSSAI headquarters. In Delhi, there In 2006, the Food Safety and Standards Authority of India (FSSAI) was founded, and it are six regional offices like Mumbai,

¹⁰ Unknown; Food Adulteration : Laws , Punishment and its Competent Authority; LITEM ; <https://www.litem.in/food-adulteration.php#:~:text=Punishment%20for%20Food%20Adulteration,-Under%20section%20272&text=The%20punishment%20for%20unsafe%20food,fine%20of%20Rs%205%20lakh>

⁸ Supra note 2

⁹ Indian Penal Code, 1860 ; No. 45 , Act of Parliament, 1860(India)

Guwahati, Cochin, Chennai, Kolkata, and Mumbai. Its goal is to oversee appropriate food quality and hygiene monitoring in India. The Food Safety and Standards Act of 2006 is a law that unifies food - related laws and establishes the Food Safety and Standards Authority of India. Its purpose is to establish scientific standards for food articles and regulate their manufacture, storage, distribution, sale, and import. Additionally, it addresses matters related to or incidental to these regulations, ensuring the availability of healthy and safe food for human consumption¹¹.

Functions of FSSAI:

The followings are some functions of FSSAI:

- **Setting Rules and Regulations:** FSSAI sets some rules and regulations for the food manufacturing companies, keeping in mind the hygienic and safety for the consumers.
- **Issuing License:** In order to run any food related business, the owner needs to issue a certificate and license with the permission of FSSAI.
- **Regular Audits:** Proper and regular inspection shall be done by the officer for food producing and manufacturing food companies to maintain standard as per the act.
- **Spreading Awareness:** It is the responsibility of the act to spread awareness among the consumers about healthy and hygienic food.

The Supreme Court ruled in **State of (Maharashtra v. Sayyad Hassan Sayyed Subham (2018)** ¹², that "if an act or an omission constitutes an offence under two enactments and prescribes punishment for the same. " The perpetrator may face legal action and punishment under one or both of the enactments, but they cannot face punishment for the same offence twice. Therefore, just because the FSSAI's regulations include the penalty for the crime, it doesn't mean that an IPC prosecution is barred.

3. Global Aspect of Food Adulteration

Food fraud is a problem that is not limited to India; it is present throughout Europe, America, Asia, Australia, and other continents. This dishonest behavior creates ethical questions in addition to serious health hazards. Approximately 57% of people worldwide suffer from health problems as a result of eating contaminated food. For instance, melamine has been used in milk products in adulteration instances in China, which has led to significant illness and even fatalities.

Food adulteration is a major issue in Bangladesh, where fruits, vegetables, and fish have reportedly been adulterated with formalin—a colorless solution—in order to preserve their freshness and look. Given that formalin is a recognized carcinogen, this method puts customers' health at severe risk. Similar problems still exist in Pakistan, where food products are adulterated with substances like chemicals, urea, and

even sewage water to make them seem better or have more volume.

In Europe, despite having stringent regulations, incidents of food adulteration still occur. In recent years, scandals involving mislabeling of meat products, such as horse meat being sold as beef, have highlighted weaknesses in the food supply chain and raised concerns about transparency and accountability. Similarly, in Italy, known for its culinary heritage, cases of olive oil adulteration have been reported, where cheaper oils are mixed with premium olive oil and sold under false act.

In America, cases of adulteration have been reported, including the dilution of fruit juices with water or cheaper juices, as well as the mislabeling of seafood products. In neighboring Canada, incidents of food fraud, such as the misrepresentation of organic products or the addition of lower - grade ingredients, have been found documented, highlighting gaps in enforcement.

4. Conclusion

In conclusion, food adulteration is a widespread problem that affects nations all over the world and crosses national boundaries. Further action is required to preserve the integrity and safety of the food supply chain as well as shield consumers from the health hazards connected with contaminated foods, even if efforts to prevent food fraud through legislation and enforcement are still underway.

India is among the nations most severely affected by the global issue of food adulteration. Due to inadequate regulation, lax enforcement, and profit - driven corporate practices, adulterants like chemicals, insecticides, and unauthorized colorants find their way into food products in India. Each year, millions of individuals are impacted by this, which poses major health risks. There is some risk mitigation because of stringent regulations and monitoring systems, even if food adulteration is an issue in other countries as well. Nonetheless, international collaboration is required from all nations due to global trade in order to ensure that food safety laws are followed worldwide. Collaboration between governments, corporations, and consumers is necessary to tackle this issue in order to safeguard public health and faith in food systems.

¹¹ Unknown; Food Adulteration; BYJU'S ; <https://byjus.com/biology/food-adulteration/>

¹² State of Maharashtra v. Sayyad Hassan Sayyed Subham (2018) , AIR 2018 SUPREME COURT 5348