



# FOOD ADULTERATION AND ITS IMPACT ON HEALTH

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## ABSTRACT

Food adulteration means adding some foreign substances to food products in order to increase the quantity or to enhance appearance of food products. This paper includes an overview of various types of food adulteration with detailed examples, the adulterants added to food items and adverse effects of food adulteration on human health like kidney failure, intestine issues, cardiac issues etc. It includes a brief discussion of various techniques used for identification of adulterants in food items.

**KEY WORDS-** Adulteration, Health impacts, Adulterants, intentional, Incidental

## INTRODUCTION

Food adulteration generally means adding some foreign substances to food products in order to increase the quantity or to enhance appearance of food products. The foreign substances or the adulterants can be dyes, chemical substances etc. The consumers have to face severe health issues due to adulteration in food.

The adulterants are added for many reasons like

- 1) Profit maximization by using cheaper adulterants in place of expensive ingredients.
- 2) Challenges in supply of chain such as shortages of ingredients or raw material.
- 3) To add preservatives to enhance shelf life of food products.
- 4) To enhance the appearance of food products by adding color, texture etc.
- 5) To meet the demand in the market by increasing quantity of product.

Merits of food adulteration are like

- a) Reduction of cost of product due to substitution of expensive ingredients by cheaper alternatives
- b) Extended shelf life by using preservatives in food products to reduce chances of spoilage of food
- c) Appearance Enhancement

Demerits of Food adulteration includes Health risks to consumers including toxicity, allergic reactions etc., Loss of nutritional value in food product, Damage of reputation of manufacturers as well as suppliers and some legal consequences to the business person involved.

The addition of adulterants in food products can be analyzed or checked by using various techniques like

- (a) Chemical test- By using reagents or chemical indicators, the presence of specific substance in food can be detected like iodine test can be used to check the presence of starch in food items etc.

(b) Microscope Examination - This involves the examination of food item under microscope to identify adulterants present. Example- Adulteration in Spices, flour or other powdered substances can be detected by this method.

(c) Spectroscopic techniques- UV- Visible Spectroscopy, NMR (Nuclear Magnetic Resonance) or Infrared Spectroscopy can be used to analyze the adulterants or composition of food items.

(d) Chromatographic Methods: Gas chromatography (GC), High performance liquid chromatography (HPLC), Thin Layer Chromatography (TLC) can be used to identify the components or adulterants of food samples.

(e) DNA testing - This method is effective for checking the authenticity of fish, meat or other animal products.

## OBJECTIVES

- To study the different adulterants added to food products.
- To study the impacts of adulterants on human health.

## TYPES OF ADULTERATION

Broadly there are two types of Adulteration:-

1. Intentional Adulteration
2. Incidental Adulteration

Intentional Adulteration	Incidental Adulteration
<p>With this type of adulteration, the food items are deliberately adulterated. The substances which are difficult to identify and having similar properties to that of the food are added. To increase the volume of food items, substances like flour, vegetable oils, starch, cane sugar, skim milk, stone, chalk powder, brick powder etc. are added.</p> <p>This type of adulteration is beneficial for business oriented people to make money.</p>	<p>This type of adulteration is the result of addition of foreign substances to the food items due to negligence or ignorance. Accidental adulterants are mainly larvae in foods, dropping of rodents, residues of pesticides etc. Most common adulterants added accidentally are pesticides, DDT and residues present on the plant products.</p>

Table 1:- Different Food Items, Adulterants added and Types of Adulteration

Sr No.	Food Item	Adulterants	Type of Adulteration
1	Milk	Water, starch, urea, extraction of fat	Intentional
2	Sugar powder	Chalk powder	Intentional
3	Tea	Artificial pigments/dye	Intentional
4	Coffee powder	Tamarind and date seed powder, saw dust, Chicory powder	Intentional
5	Salt	Stone, white powder, rawa	Intentional
6	Chilli powder	Brick powder, sudan dye, artificial colors	Intentional
7	Turmeric powder	Lead chromate, metanil yellow, anillin dye	Intentional
8	Mustard seeds	Seeds of prickly poppy argemone	Intentional
9	Black pepper	Dried papaya seeds	Intentional
10	Rice/Wheat	Mud grits, sand, Ergot	Intentional
11	Pulses	Kesari dal, clay, stone	Intentional
12	Honey	Fructose syrup, cane sugar	Intentional
13	Butter	starch	Intentional
14	Ghee	Sweet potato, mashed potato, starch,	Intentional
15	Vegetable oil	Argemone mineral oil	Intentional
16	Carbonated drinks	Aluminium leaves	Intentional
17	Ice Creams	Detergent Powder	Intentional
18	Sea food	Mercury, Arsenic	Intentional
19	Sweet juices	Coal tar dye	Intentional

20	Coriander powder	Cow dung powder	Intentional
21	Condensed milk	Khoya, paneer	Intentional
22	Jaggery powder	Chalk powder	Intentional
23	Red Wine	Juices of Bilberries	Intentional
24	Jeera	Alike seeds from wild plants, stone	Intentional
25	Others like preservatives, etc .	Formalin, etc.	Incidental
26	Fish	Formaldehyde	Intentional
27	Infant formula	Melamine	Intentional
28	Apples	Wax coating	Intentional
29	Mangoes and Bananas	Calcium carbide	Intentional

## HEALTH IMPACT OF FOOD ADULTERATION

In this hectic work schedule, it is essential for every one to be aware of the quality of the food we are purchasing from the market.

If the adulterated food is consumed regularly can cause severe symptoms on human health.

Table 2:- Health Risk of the Adulterant added to the food

Sr No.	Food Item	Adulterant	Health Risk
1	Silver foil	Aluminium foil	Small intestine problems
2	Honey	Water	
3	Common Salt	White stone powder	
4	Sugar	Chalk powder	Stomach pain and disorder
5	Sea food	Arsenic or mercury	
6	Milk	Unhygienic water, urea	
7	Chilli powder	Brick Dust, artificial colour	
8	Cereals	Mud, Ergot seeds, stone	Carcinogenic
9	Fish	Formaldehyde	
10	Turmeric powder	Anillin dye	
11	Edible oils	Mineral oils, pongamia oil	
12	Mangoes and Bananas	Calcium carbide	Liver Disorders
13	Tea	Artificial pigments/dye	
14	Black pepper	Dried papaya seeds	
15	Jeera	Stone, Alike seeds from wild plants	Lung Infections
16	Carbonated Drinks	Aluminium leaves	
17	Ice Creams	Detergent Powder	
18	Wheat Flour	Chalk powder	Stomach Pain, Diarrhea
19	Apples	Wax coating	
20	Ice Creams	Metanil yellow, washing powder	

## CONCLUSION & SUGGESTIONS

Knowing the types and health impacts of the adulterants added to the food items, it can be concluded that 'Food Adulteration' is the major threat to the health of growing young minds and the society.

The FSSAI (Food Safety and Standards Authority of India) is an agency of the ministry of Health and Family welfare by the Government of India which takes care for the supervision of food items to ensure the public health. Various initiatives can be taken by the government for inspection of Local and Branded food stores, awareness campaign

should be conducted on regular basis to aware regarding the risk factor and also the hike of price should be checked. Limited usage of pesticides and insecticides, safe storage of food and grains, easy cultivation methods can be adopted to reduce the risk of adulteration.

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