

Food adulteration

Food adulteration means anything adding or subtracting with food making it injurious to health. This adulteration may be done intentionally or unintentionally. Intentional adulteration is a criminal act and punishable offense. Or the process of lowering the nutritive value of food either by removing a vital component or by adding substances of inferior quality.

As per PFA act (prevention of food adulteration act), Not only the intentional addition or abstraction of substances which adversely affects the nature, standard, and quality of foods but also their incidental contamination during the period of growth, harvesting, storage, processing, transportation, and distribution

PFA Act 1954:

The prevention of food adulteration act provide the protection from adulteration /contamination of the food that may lead to the health risk of consumers.

Types of adulteration:

- There are three types of adulteration namely:

1. Intentional adulterants:

2. Metallic contamination:

3. Incidental adulterants:

Intentional adulterants

- Intentional adulterants are sand, marble chips, stone, mud, chalk powder, water, mineral oil and coal tar dyes. This adulteration cause harmful effects on the body.

Metallic contamination

Metallic contaminations include arsenic from pesticides, lead from water, and mercury from effluents of chemical industries, tin from cans.

Incidental adulterants

Incidental adulterants *are* pesticide residues, tin from can droppings of rodents, larvae in foods. Metallic contamination with arsenic lead, mercury can also occur incidentally. Pests such as rodents and insects intrude into the food at high degree and produce filth in the form of excreta, bodily secretions and spoilage through microorganisms. The most common incidental adulterants are pesticides, D.D.T and marathon residues present on the plant product. The maximum permissible residue allowed for D.D.T, marathon is 3 ppm

Food Adulterations Categories

- **Replacement:** Complete or partial replacement of a food ingredient or valuable authentic constituent with less expensive substitute with the intention of circumventing on “*origin*” and *false declaration of the “process*”.
- **Addition:** Addition of small amounts of non-authenticated substances to mask inferior quality ingredient.

- **Removal:** Removal of authentic and valuable constituent without purchasers knowledge
- Food Adulterations

Some common adulterants and the diseases caused by them: Milk: Cow/buffalo milk can be adulterated with starch, milk powder and urea

- ❑ Health effect: Cancer or acute renal failure
- ❑ Tur dal, Turmeric powder, mixed spices, saffron
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- Adulterants : Metanil yellow, a non-permitted color is a common adulterant in food items like laddu, tur dal and turmeric.
- Health effect: tumor and cancer

Ghee

- Adulterants: Ghee essence is used in cheaper oils and passed off as pure ghee. This type of ghee will not solidify like normal ghee. It may also not have that grainy texture of pure ghee.
- Oleomargarine or lard - added to butter.
- Health effect:
- Cancer or acute renal failure.
- The argemone oil used to adulterate ghee and butter is highly toxic. It causes a disease known as dropsy. Watery fluid collecting in some parts of the body is the main symptom. It affects the normal functioning of the body. It may also paralyse the limbs.

Sugar and Salt

- Adulterants: With chalk powder and white sand ,may cause stomach disorder.
- ❖ Health effect: Stomach disorder

Tea powder

- Adulterants : With used tea leaves, dye or artificial colour, iron fillings.
- Tea- coloured tea leaves after removing the essence.
- ❖ Health effect:Cancer, tetanus

Chilli powder

- Adulterants: Chilli powder: Sudan red, red brick powder, grit, sand, dirt, non-permitted colors, saw dust or use dry papaya seeds to obtain the required color.
- ❖ Health effect: Stomach disorder

Sudan dye is carcinogenic

Sweets

- Adulterants : Metanil yellow used to brighten the colour of pulses, turmeric powder and sweetmeats, is colours not permitted.
- Health effect :tumor and cancer

Mustard seeds and vegetable oil

- **Adulterants** : Argemone seeds and argemone oil
- **Health effect:** Epidemic dropsy

Honey

- **Adulterants:** Jaggery, Sugar, Corn syrup
- **Health effect:** Obesity, Diabetes mellitus, Eyes and nerve damages
- **Adulteration on bakery items and dairy products** may have tremendous effects on a child's health. Such as cream-filled foods, cereal, cream sauces causes increased salivation, abdominal cramp, vomiting and prostration. Improperly processed milk and canned meat may cause food poisoning and abdominal pain.

Reasons for food adulteration are

- ◆ To earn more profits
- ◆ To increase the weight, adulterant is added.
- ◆ To increase volume of trade by showing lower prices.
- ◆ When supply is less than demand
- ◆ To cut down the product costs to meet the market competition.
- ◆ Shortage of authentic ingredients at affordable prices.
- ◆ Shortage of qualified personnel and no updation of processing techniques.
- ◆ Inadequate knowledge on the consequences and associated food safety risks.
- ◆ Lack of awareness and updation of the information on the adulteration related food safety outbreaks.
- ◆ Adulteration in general is done to increase commercial attribute/ characteristic of the products.
- ◆ Sometimes Adulteration, even though not hazardous may lead to severe contamination issues, e.g. spraying of water on dry chilies to cope with the excess weight loss may lead to Aflatoxins
- ◆ Blending is not Adulteration, unless origin of the product is To
origin of the product is significant

Prevention of Food Adulteration Act, 1954

The prevention of food adulteration act provide the protection from adulteration /contamination of the food that may lead to the health risk of consumers.

□The Act was declare by Parliament in 1954 to make provision for the prevention of adulteration of food. Broadly, the PFA Act covers food standards, general procedures for sampling, analysis of food, powers of authorized officers, nature of penalties and other parameters related to food. It deals with parameters relating to food additives, preservative, colouring matters, packing & labelling of foods, prohibition & regulations of sales etc. The provisions of PFA Act and Rules are implemented by State Government and local bodies as provided in the rules

The act clearly defines “What is meant by Food Adulteration and what is the punishment given to person/manufacturer involved in the crime? The food is considered adulterated if it fulfills any of the below-

- If food is sub-standard rotten, decomposed or obtained from diseased animal or is insect-infested or is otherwise unfit for human consumption.
- If food contains any other substance which affects, or if the article is so processed as to affect, injurious in the nature, substance or quality thereof
- if the article has been prepared, packed or kept under insanitary conditions whereby it has become contaminated or injurious to health;
- if the article contains any poisonous or other ingredient which renders it injurious to health
- if any colouring matter other than that prescribed in respect there of is present in the article, or if the amounts of the prescribed colouring matter which is present in the article are not within the prescribed limits of variability
- if the article contains any prohibited preservative or permitted preservative in excess of the prescribed limits;
- if the quality or purity of the article fall below the prescribed standard. Prevention of Food Adulteration Act, 1954