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## **19FTT302 & Food Safety and Quality Regulations**

### **UNIT 1 : FOOD SAFETY**

#### **TOPIC 8: Adulteration**

An adulterant is any substance that is added to food in order to reduce the quality while increasing the quantity. Food adulteration is the process of adding an adulterant to a food product. Food adulterants are defined as foreign, inferior, and frequently inferior chemical substances that are harmful or undesirable in food. The addition of adulterant may be intentional or accidental. But little amounts of non-nutritive ingredients are intentionally added to foods to enhance its appearance, texture, or storage capabilities. The main purpose of adding these adulterants on purpose is to increase profits at the expense of the general public's or consumer's health.

The addition of these adulterants reduces the nutritional value of food and also contaminates which is unfit for consumption. All of the food items we normally consume, such as dairy products, cereals, legumes, grains, meat, vegetables, fruits, oils, and drinks, may include these adulterants.

#### **Examples of food adulterations**

Some of the examples of food adulteration are listed below:

- Mixing of pulses with stones and sand.
- Mixing of milk with water.
- Mixing oil with chemical byproducts or less expensive oils.
- Packing low-quality food products with fresh and high-quality ones.

#### **Why is Food Adulteration Done?**

In developing nations, it is common for food to be contaminated or to have additional ingredients added. Milk may be made more abundant by diluting it with water, and its solid content is frequently increased by adding starch powder.

The main reason for adulterating food product are mentioned below:

1. Adulteration of food is a practice used in business to increase profit through less expensive techniques.
2. Lack of knowledge of proper food consumption.
3. Adulteration makes food heavier, contributes to higher profits, and increases sales more cheaply.

4. Increased food demand for a rapidly growing population.
5. The effectiveness with which government efforts to control it.

### Types of food adulteration

- **Intentional Adulteration:** When ingredients that resemble the food's components are added to raise the food's weight and maximize profit. eg mixing of pebbles, stones, marbles, sand, mud, filth, chalk powder, contaminated water, etc.
- **Incidental Adulteration:** Accidental food adulteration happens as a result of carelessness. For e.g. residues of pesticides in grains, larvae growth, presence of droppings of rodents, etc.
- **Metallic adulteration:** Metal adulteration is the adding of metallic substances like lead or mercury to food. It may happen intentionally and accidentally. eg arsenic from pesticide, lead from water, effluent from chemical industries, tin from cans.

Food product	Adulterant	Harmful effect
Honey	Molasses, dextrose, sugar and corn syrups	Stomach disorders
Jam, Juice and Candies	Non-permitted dyes including metanil yellow and other artificial food dyes.	Highly carcinogenic
Milk and milk product	Water and starch powder	stomach disorder
Grains	Dust, Pebbles, Stones, Straw, weed seeds, damaged grain, etc.	Liver disorders, Toxicity in the body, etc.
Ice Cream	Pepper oil, ethyl acetate, butyraldehyde, nitrate and washing powder	Dreadful diseases that affect organs including lungs, kidneys, and heart.
Turmeric, dals and pulses	Metanil yellow, kesari dal	Highly carcinogenic, stomach disorder
Mustard seed and mustard oil	Argemone seed, papaya seed	Epidemic dropsy, severe glaucoma
Coffee powder	Tamarind seed, chicory powder	Diarrhea, stomach disorder, giddiness, severe joint pains
Tea	Artificial coloring agents	Liver disorder
Edible oil	Minerals oils, karanja oil, castor oil and coloring agents	Gallbladder cancer, allergies, paralysis, cardiac arrest.

### Harmful effect of food adulteration

- **Increases the impurity in food:** Food that has been adulterated has more impurities, making it unfit for human consumption. Long-term consumption of contaminated food will affect our

health in both the short and long terms. Impure food is unsafe to consume so it is better to produce stuff as far as possible or to get stuff from organic centers or directly from the farmers.

- **Lack of nutritional value:** Food that has been adulterated is of poor quality and has very little nutrition. Also, some contaminated food has a taste all its own. We are compromising our health and flavor when we buy and eat contaminated food.
- When lead chromate is mixed with spices like turmeric powder, it can cause anemia, paralysis, brain damage, and abortions.
- Water and alcoholic beverages may contain cobalt, which can harm the heart. Furthermore, tin, copper, and zinc might result in colic, vomiting, and diarrhea.
- Non-approved colour or permitted food colour like metal yellow, exceeding the permissible limit in colored food can cause allergies, hyperactivity, liver damage, infertility, anemia, cancer and birth abnormalities.