

19. FOOD ADULTERATION

Adulteration of food is common in whole world among business class. Consumer wants food stuffs in a cheaper rate. In today's scenario, business man has to maintain their standard, and for the same, they have to fulfill the needs of consumer. This is vicious cycle which never end up. This mainly depends on economy. Consumer can buy commodities easily if economy is good, but due to inflation at individual and national level, they are bound to buy all items. There is an increase in rates of the commodity due to season/disaster and it is not possible for the consumer to buy that product on high price. This is the main reason for adulteration. Retailer add low grade food stuffs in order to make more profit which is hazardous to our health.

It is necessary to know that the government has enacted the prevention of food adulteration act 1954 which was started on 1 June 1955 to safeguard the consumer from the health hazards posed by the practice of adulteration. According to this act it was proposed that what type of food should be marketed.

Definition of Adulteration :

Adulteration means not only intentional addition or substitution or subtraction of substances which adversely affect the nature, substance and quality of food, but also their incidental contamination during growth, harvesting, storage, processing transportation and distribution. Mainly two type of adulteration is done.

- (i) To incorporate external and cheap quality product.

- (ii) To remove some important material from the food stuff.

Best example for the first is to mix water in milk and for the second remove oil from walnuts etc. Adulteration can be hazardous to consumer whether something is added or removed from food stuff.

Types of Adulteration :

There are 2 types of adulteration :

- (i) **Aimful / Intentional Adulteration :** This type of adulteration is done by seller to gain more & more profit & money. The consumer gets robbed & does not attain the proper value of his money. Cheap and harmful external elements are mixed in food materials intentionally in this kind of adulteration. The important valuable and nutritive extracts are substituted from cheap & low quality of elements. Sand, rock particles, wires, colors' etc are found in intentional adulteration. These adulterated elements have harmful effects on health.
- (ii) **Unintentional/Emergent Adulteration :** This kind of adulteration mainly occurs due to carelessness, lack of proper facilities accidentally. Emergent adulteration is done because of mixing harmful elements like mercury, extracts of pesticides, existence of crabs in food materials, remnants of animals, infected by microorganism etc. Food materials are adulterated by the contamination of these elements.

Unintentional / Emergent adulterated elements :

- (i) The argemone grass usually grow with mustard. The seeds of argemone mixed with crop of mustard due to carelessness in the process of cutting crops. The seeds of argemone grind with mustard in the process of extracting oil. The mixture of argemone grass with mustard is harmful as it causes epidemic drop disease.
- (ii) Poisonous gas like Chloro oxygen is found in the smoke food & this smoke contaminates food.
- (iii) The lack of clean, appropriate atmosphere & storage facilities during production of food, in the processing and distribution of food elements. This causes contamination of food by waste materials, micro-organisms, fungus, harmful insects, waste extracts of insects etc.
- (iv) The most common emergent adulterated elements which is found in highest quantity is D.D.T.(Dichloro Di Phenyl Trichloro ethane) &

Methane. The contents of these elements are higher than standardized amounts in plants.

Statutory and approved ways can be opted to maintain the quality of food elements :

- (i) Aware public about adulteration of harmful elements in food materials by regular inspection of market.
- (ii) There should be centralized programmes of pesticides management so that farmer can be trained about the use of pesticide. Suggest farmers not to use pesticides for crop before a week of harvesting of crops.
- (iii) Use of safe pesticide like pyrethroid and methane
- (iv) Control of insects by such living organisms which feed on them.
- (v) Fruits & vegetables should be properly washed before eating & cooking them.

Table 19.1 : Food adulterants and their harmful effect

Food items	Adulterated items	Harms
Cereals : Wheat, maize, rice, others. Bajra	Stones, rocks particles, cheap quality of cereals. Argot (a type of fungus)	Not getting the actual value of money. Toxicity
Pulses : Arhar dal Moong dal	Kesari dal, coaltar color- red chromate. Metanil yellow color. Melachite green(green color)	Paralysis in legs, cancer, neuro toxicity. Problems related to digestion, stomachache, chances of wound, cancer. Chances of cancer.
Milk & Milk products : Milk Milk , paneer, khoa, condensed milk Ice cream.	Impure water, removal of fat & cream, Starch. Toxic colors, washing soda.	Digestion problems, not getting actual value of money, less nutritive value of milk. Digestion problems, lowering the nutrition quality of product. Diseases of liver or intestine. Stomach and liver related abnormalities/diseases

Oil related :		
Edible oil	Argimone oil, mineral oil, castor oil.	Epidemic dopsy, glaucoma, blindness, heart disease, tumor, chances of cancer, liver & stomach related problems.
Ghee	Vegetable oil & animal fats	Not getting actual value of money.
Spices :		
Black pepper	Seeds of papaya	Stomach & liver disorders.
Asafoetida	Resin, galevenum,	Dysentery
Turmeric powder	Yellow anelin dye . metanil yellow, tapiyoka starch	Cancerous, stomach disorder.
Red chilly powder	Brick powder, wood powder, red color.	Stomach disorder, cancer
Clove	Clove oil is extracted	Not getting actual value of money.
Yellow mustard	Seeds of argimone	Epidemic dropsy
Jaggary	Washing soda & chalk powder	Vomiting, diarrhea.
Sugar	Chalk powder	Stomach disorder.
Honey	Sugar syrup	Stomach disorders & not getting actual value of money.
Coffee powder	Powder of seeds of tamrind & dates.	Diarrhea, stomach disorders, dizziness , pain in joints.
Tea	Chikori powder.	Liver and stomach disorders.
	Used tea leaves(colored & processed)	

Paralysis of legs :

The kesari dal is mixed with lentil (tur) dal. Poisonous amino acid is found in kesari dal. It is



Fig. 19.1 : Paralysis of legs

necessary to remove that amino acid before consumption. The excessive consumption of dal for longer period without its treatment causes paralysis of legs and person is unable to move around.

Epidemic Dropsy :

Argemone is weedy grass. The seeds of this weedy grass is adulterated / mixed with mustards' seeds. The oil which produced from this is further mixed with costly oils (mustard oil & peanut oil). The consumption of this adulterated oil for 1-3 months causes epidemic dropsy disease in humans. In this disease, water retention in body cause odema. This illness starts with digestive problems. The swelling in skin & fever with slow pulse rate are common in this disease. The swelling increases slowly from legs to thighs hands & face. It affects the eyes, glaucoma, increase in size of liver, cancer also take place with the increased duration of disease and person can dies due to heart collapse.



Fig. : 19.2 Epidemic Dropsy

Prevention of adulteration in food materials

As we have studied earlier that there are different kinds of adulteration (intentionally, emergent) in food materials & it has severe harmful effect on health. So there is an urgent need to stay aware & follow these precautions:-

- (i) Consume more and more of fresh food materials.
- (ii) Lesser use of polished food materials, as the food is more polished, the chances of adulteration becomes higher. For example the chance rate of adulteration is higher in grinded cereals than whole cereals. So we should not use polished food and the preparation of food materials should be done at home. For example grinding of whole turmeric, chilly, coriander, ground spices at home.
- (iii) In today's era, adulteration is burning problem. It is necessary that consumer gets education to solve this problem.
- (iv) In this mechanized civilization, it is impossible to low/reduce the dependency of humans on readymade food materials of market. So people should be aware to purchase standardized pay base food material.

Food security & standard act 2006 :

Earlier, all the food security rules, laws & orders were gathered & consolidated into food security & standard act 2006. This is first rule of regulation of

food materials. It is base for preparing & implementing laws for food security in India. Various laws & orders were popular for food security before this act and they are as follow :

- The prevention of food adulteration act (1954).
- Fruits product order (1955).
- Meat food product order (1973).
- Vegetable oil product control order (1947).
- Food packaging regulation order (1988).
- Solvent extracted oil, de-oiled meal & edible flour control order (1967).
- Milk & milk product materials product order (1922).

All these acts & orders are consolidated into new act F.S.S.A.I.-2006.

Food safety & standard act 2006 :

The F.S.S.A.I. (Food safety & standards authority of India):- The F.S.S.A.I. 2006 contains all the acts which were popular earlier. According to this act, production, distribution, storage, import & human consumption of food materials has established scientifically & in standardized manner. The establishment of FSSAI was done according to food security & standard act 2006. FSSAI is an autonomous body of health & family welfare ministry. It is responsible for development & conservation of public health in India. The FSSAI was organized by Indian govt. on 5 sep. 2008 to the act of 2006. There is a chief head of FSSAI who is non-govt. person. He is appointed by Indian govt. & its post is equivalent to secretary of India. There is 22 members (other than head) in this organization.

The H.Q. of FSSAI is situated in Delhi. It has 6 regional offices which are situated in Delhi, Guwahati, Mumbai, Kolkata, Cochin & Chennai. There are 14 referral laboratories, 72 state/U.T. laboratories & 112 private laboratories are notified in whole nation.

FASSI is a permanent organization & the powers given by act of 2006 to it, are following:-

- (i) To make laws for standards of food security
- (ii) To give guidance in the inspection of laboratories for the security of food materials.

- (iii) To provide scientific & technical knowledge to the central govt.
- (iv) To provide contribution in the development of international standards for food security.
- (v) To collect/gather data of consumption of food material, contamination & possible dangers produced by it.
- (vi) To produce awareness about nutrition & security of food in India.
- (vii) To appoint officers at state level.

Aims/ objectives of F.S.S.A.I :

- (i) To determine scientifically based standards for food security.
- (ii) To regulate the production, storage, distribution & import of food materials.
- (iii) To determine the quality & security of food materials.

Food security/safety is scientifically based discipline on all the activities of food, its production, storage distribution, import & selling. The standard symbol of FSSAI is : *fssai*. It is marked on the production of food materials.

Important Points :

- 1. Adulteration is a process which changes the basic quality or dimensions of food materials.
- 2. Adulteration can be aimful/intentional or unintentional/emergent adulteration.
- 3. Adulteration causes the depletion of quality and purity of food which has deleterious effect on health.
- 4. Consumer education should be done to prevent the adulteration.
- 5. Consumer must consume fresh, less preserved and processed food bearing proper standard mark.

Questions :

1. Choose the correct answer for the following questions :
 - (i) External of inferior elements mixed to the food ingredients are called as :
 - (a) Stones, rock pieces
 - (b) Adulterants
 - (c) External elements
 - (d) All of the above
 - (ii) Adulteration being done by seller purposefully is known as :
 - (a) Unintentional adulteration
 - (b) Intentional adulteration
 - (c) Mineral adulteration
 - (d) Microorganism infestation
 - (iii) Seeds of weed mixed with mustard oil are :
 - (a) Mustard seed (b) Onion seed
 - (c) Argemone (c) None of these
 - (iv) Prevention of adulteration in food essentially require :
 - (a) Fresh and less processed food
 - (b) Educated and attentive consumer
 - (c) Purchase material with standard mark
 - (d) All of the above
 - (v) Food prevention act is :
 - (a) FPO (b) FSSAI
 - (c) PFA (d) AG mark
2. Define adulteration.
3. Explain the type of adulteration with example.
4. How can you prevent adulteration in food material. Explain.
5. Write down the deleterious effect of consuming adulterated food.

Answers :

1. (i) b (ii) b (iii) c (iv) a (v) b