

A SUCCINCT VIEW ON HAZARDOUS EFFECT OF FOOD ADULTERATION

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ABSTRACT

Food is one of the basic necessities of life. So, it should be pure and free from any type of adulteration. Food adulteration includes mixing, substitution, concealing the quality, putting up decomposed food for sale, giving false labels and addition of toxicants. This is a very common problem that occurs globally and it affects almost all food commodities. It is very difficult to find a sector of the food industry which is free of food chemicals or adulteration. Adulteration results in decreased food quality and it also lowers the dietary ingredients of food that presents a significant risk of illness to the consumer. This is usually done to increase the quantity of food product and also to lower

the cost. Now, the methods of food adulteration have become more sophisticated. In *Ayurveda*, the toxic combination of poisonous or non-poisonous substances which exert toxic effects on health after an interval of some time comes under the concept of *Garavisha*. Long term use of adulterated food with toxic chemicals brings a threat to public health. Adulteration can be prevented by a few alerting steps of society. There is a need to increase social awareness, so that people can become careful about buying foods and food articles.

KEYWORDS: Adulterants, Food quality, *Garavisha*, Toxic chemicals, Toxic effects.

INTRODUCTION

Ayurveda has described the *Trayopastambha* for the healthy life of individuals.^[1]

Food is one among the basic necessities of life along with air and water. The outcome of food is nothing but the healthy body as well as the disease. Out of the factors for maintenance of healthy life, food occupies the more importance because it is the basic medicament other than

any substance. Food articles are supposed to maintain a state of equilibrium of *Dosha, Dhatu, and Mala*.^[2]

Whatever we eat, it affects our body as well as mind. So we should eat both delicious and wholesome food which will provide nourishment to both the body and sense organs.

Natural products play an important role in maintaining the health of individuals. In the second half of the 19th century, the economic changes, industrial development and migration of the population from rural to urban areas, there was increasing demand for cheap foodstuffs, which contributed to the growth of mass food production, as well as to the increase in adulteration of foodstuffs. Food adulteration has been a concern since the beginning of civilization, as it not only decreases the quality of food products but also results in number of ill effects on health. Food safety is a significant public concern directly impacting human health worldwide. With increasing adulteration, food safety has become an important research field.

AIM AND OBJECTIVES

- 1) To study the hazardous health effects caused by food adulteration.
- 2) To create public awareness regarding food safety and to prevent and control food adulteration.

Food adulteration

Adulteration is the failure of a food product to follow the hygiene rules regularly. Food adulteration is the addition of extraneous impure or inferior ingredients or subtraction of any substance to or from food, so that the natural composition and quality of food substance is affected. It includes mixing, substitution, concealing the quality putting up decomposed food for sale, misbranding or giving false labels and addition of toxicants. The health hazards can result from either addition of deleterious substances or removal of a vital component. Some adulterants may even lead to death. Sellers used harmful chemicals to make the products more lucrative, increase shelf-life, substitute for unavailable natural raw materials and to reduce price of the goods.^[3] Recently, a growing concern has been the use of prohibited food colours, such as textile dyes in many foods to increase acceptability of

food.^[4] In India, consumption of non-permitted textile colours or abuses of colours were attributed to reported foodborne illnesses.^[5] Main adulterants in food samples include water in milk, chalk powder in sugar, artificial color in chili powder, water-soluble colour in green and black gram and essential oil removed from cardamom etc.^[6]

Types of food adulteration^[7]

- 1) **Intentional:** Economically motivated adulteration of food also known as food fraud is the intentional addition of food for financial gain. Substances are added in food to improve appearance, flavor, texture or storage properties for financial gain. eg. Food preservatives, mineral oil, water, chalk powder etc.
- 2) **Incidental:** It is attributed to ignorance, carelessness or lack of facilities for maintaining food quality. eg. Pesticide, DDT residues present on the plant product, larvae in foods, droppings from rodents.
- 3) **Metallic contamination:** Metallic contaminants enter the food supply chain through environmental contamination or during food production process. Adverse health effects depend on chemical nature, the amount and duration of individual exposure etc. eg. Arsenic from pesticides, lead from water etc.
- 4) **Packaging hazards:** Polyethylene, polyvinyl chloride and allied compounds are used to produce flexible packaging material.

Some common adulterants

Sr.no.	Food product	Adulterant	Harmful effects
1	Milk	-Unhygienic water -Chalk powder -Soap water -Starch -Hydrogen peroxide -Urea	-Food poisoning -Heart problem -Cancer -Vomiting -Nausea
2	Coffee powder	-Tamarind seed -Chicory powder	-Diarrhoea -Stomach disorders -Giddiness -Joint pain
3	Chili powder	-Brick powder -Saw dust	-Stomach problems -Artificial colour can cause cancer -Hepatotoxicity
4	Turmeric powder	-Yellow aniline dye -Non-permitted colourants like metanil yellow	-Carcinogenic -Stomach disorders
5	Mustard seeds	-Argemone seeds	-Epidemic dropsy

	and oil		-Severe glaucoma
6	Ice-cream	-Washing powder	-Liver disorders -Stomach disorders
7	Green chilies	-Malachite green (a coloured dye)	-Carcinogenic -Hepatotoxicity
8	Ghee	-Vegetable oil -Animal body fats	-Anemia -Enlargement of heart
9	Sugar	-Chalk powder	-Stomach disorders
10	Tea	-Coloured and processed used tea leaves	-Liver disorders

Garavisha and Food adulteration

Ayurveda not only explains about natural toxins (*Sthavara* and *Jangama Visha*) but also gives equal importance to artificial toxins (*Garavisha*) also. *Garavisha* is well explained by our ancient *Acharyas*. In *Ayurveda*, the toxic combination of poisonous or non-poisonous substances which exert toxic effects on health after interval of some time comes under the concept of *Garavisha*. Since it takes some time this type of poison to get metabolized, it doesn't cause instantaneous death of a person.^[8] Now a days due to the influence of fast life, fast foods, adulteration, pesticides, environmental pollutants people are exposed to toxins from many angles which one day become intolerance as far as health is concerned. The toxicogenesis of food, milk and drink additives is near about similar to that of *Garavisha* which reduces *Jatharagni* and absorption in gastro-intestinal tract which leads to disease.

Herbal Medicine and Adulteration

The share of herbal medicines in the worldwide medicine market is remarkable and increases every year. Recently different scientific and monitoring investigations reported to contain undeclared synthetic drugs, metals or other toxic substances in high concentration in herbal medicine which may put the health of patients at risk.^[9] Different studies reported the presence of glucocorticoids (dexamethasone, betamethasone, prednisolone, hydrocortisone), non-steroidal anti-inflammatory drugs (diclofenac, ibuprofen), anti-hypertensive agents (amlodipine, valsartan, clonidine, metoprolol) and so many other types of therapeutic synthetic agents as adulterants in the preparations of traditional herbal medicines that are sold as 100% pure, naturally originated free from side-effects.^[10]

Sometimes these adulterations may be due to the following reasons

- 1) Confusion in vernacular names between traditional system of medicines and local dialects.
- 2) Lack of knowledge about the authentic plants.

- 3) Non availability of the authentic plants.
- 4) Similarity in morphology and/or aroma.
- 5) Careless collection
- 6) Other unknown reasons

The intake of adulterated herbal medicine was suspected to cause the health problems like-allergic reactions, vomiting, skin rash, stomach upset, headache, mouth ulcers, muscle weakness, movement disorders, liver failure, kidney failure, lead poisoning, arsenic poisoning, mercury poisoning etc.^[11]

Prevention of food adulteration act, 1954^[12]

The primary object of this act is to protect the people and eradicate the evil of adulteration. The object of the act is not to punish but to prevent adulteration and raisebranding of foods as provided therein. The provisions of the law are directed for the purpose of securing purity of food and to inform purchasers of what they are buying and they must be constructed to affect such purpose. To achieve such an object, the Act has provided adequate punishment to food adulterators and made the obligations widely comprehensive and has attempted to make it impossible for them to escape liability. The object and the purpose of the Act are to eliminate the dangers to humanlife from sale of unwholesome article of food.

DISCUSSION

Adulteration is one of the biggest problems facing in the present time. Millions of people are involved in food production, processing and marketing. With the help of this massive manpower, food adulteration cycle is created within the regular food cycle. The food articles like milk, milk products, vegetable oils and fats, spices, tea, coffee etc. are adulterated from many ways. The common additives include color, flavoring materials, preservatives and insecticides etc. Some manufacturers of herbal medicines and food samples include synthetic drugs in the formula of their products which are marketed as herbal medicine to improve the effect of their products which may cause various toxic effects to health of individuals. There are various methods to detect the adulteration. Adulteration can be prevented by few alerting steps of our society. People should be aware about buying food and food articles.

CONCLUSION

Food adulteration has been a concern since the beginning of civilization, as it not only decreases the quality of food products but also results in a number of various ill effects on

health. Even traces of adulteration are also found in medicines which is a matter of serious concern. Food adulteration can result in several diseases including gastro-intestinal, neurological, immunological disease, multi organ failure and even cancer also. Initiatives should be taken by the educated segment of the society to create awareness among people. This could eventually make people refrain from adulterating food because it harms everyone as well as next generation.

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