



Chapter 11

Stay Safe From Adulterants

Food is a basic necessity for sustenance of life. A pure, fresh and healthy diet is most essential for the health of the people. Food adulteration is a menace one needs to be aware of. Adulteration is the process of adding, substituting or abstracting unwanted substances to the food, which may adversely affect the nature and quality of food. Adulterated food is food that meets any of the below criteria:

- 1 Contains a poisonous or deleterious substance**
- 2 Exists in a container that is composed, in part or in whole, of a poisonous or deleterious substance.**
- 3 Bears any chemical or pesticide residue that is unsafe.**

The only exemptions are if the adulteration is naturally occurring, or if levels are so low, they don't pose a threat to public health. Adulterated food is lower in quality and if non-edible harmful ingredients are added, then it can lead to serious health consequences too. Some of the adulterants are highly toxic for the body leading to heart failure, liver disorders, kidney disorders and more health issues. Adulteration also affects the quality of the product and may lead to nutritive deficiency in our body.

According to the Food Safety and Standards Act, 2006 an adulterant is defined as "any material which is or could be employed for making the food unsafe or sub-standard or mis-branded or containing extraneous matter."

So how can one Stay Safe?

Knowledge helps. Information about the common adulterants, foods which are likely to be adulterated and simple tests for detection of adulteration, what to look out for in packaged foods can all go a long way to keep one safe from hazardous, adulterated foods.

Know the Source

Buying food from reliable sources is imperative. This reduces the chances of the food being adulterated. Unscrupulous vendors may add inferior quality material or extract valuable ingredients from a food for economic gains.

Information is the Key

Adulterants can be found in almost all kinds of foods - food grains and pulses, edible oils and fats, spices, milk and milk products, meat and meat products, beverages (both alcoholic and non-alcoholic), tea, coffee, sweetening agents like sugar, honey, jaggery and items made from these like mithai.

Foods which are more likely to be adulterated include:

- ★ Foods which are expensive - like edible oils, spices, etc.
- ★ Foods which sell more like wheat flour, oil, etc.
- ★ Foods which are perishable like milk and milk products
- ★ Foods sold loose like milk, spices, etc.
- ★ Foods in which it is easy to mix adulterant like those in the form of powder, paste or mince

Foods that are in a powder, minced or paste form are also more likely to be adulterated, as it is more difficult for the naked eye to detect adulteration in these foodstuff. For instance, when buying minced mutton, it is difficult to tell whether the goat meat has been mixed with meat from other animals or similarly whether sawdust dyed red has been added to red chilli powder.

Adulteration of foods sold loose by the retailer is also more common as compared to packaged foods as labels carry the name and address of the manufacturer or distributor and they can be caught by the regulatory authority if their food stuff is found sub-standard. Consumers should avoid buying foodstuff sold loose even though these are cheaper.

Look Out For

Preservatives and additives: Sulphites (usually added to dried fruits, sauces, bacon, salami and wine) can cause allergic reactions and asthma attacks. Nitrites and nitrates in processed foods tend to form nitrosamines - which can increase risk of cancer. Some other preservatives to look out for are Butylated hydroxytoluene (BHT), butylated hydroxyanisole (BHA) and Ethylenediaminetetraacetic acid (EDTA).

Artificial flavours:

These are chemical substances that are used to mimic the original or natural flavour of food. They can cause chest pain, headaches, dizziness, depression, fatigue and mental health issues.

Artificial colours:

These are added to food in order to make them look more appealing. Candies, cereals, beverages, meat products and mithais (sweets) are foods which are commonly adulterated with them. They can increase hyperactivity and behaviour problems in children and may even cause allergies and increase the risk of asthma.

Toxic chemicals:

Urea, sodium carbonate (washing soda, soda), sodium hydroxide (caustic soda), formaldehyde and hydrogen peroxide added to increase the shelf-life of milk can damage the intestinal lining by irritating it. Use of the Lathyrus pulse to adulterate lentils (masoor) or toor dal or besan, can causes the crippling disease lathyrism. Mustard oil adulterated with toxic argemone oil can lead to gastrointestinal disturbances, glaucoma, respiratory symptoms and congestive heart failure. Mineral oil (liquid paraffin) and castor oil, cheap inedible oils used as adulterants may damage the intestine.



The Good Work!

FSSAI has made strong laws against adulteration. The Food Safety and Standards Authority of India (FSSAI) has been established for laying down science-based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. FSSAI has also set limits for the use of the preservatives, additives, artificial flavors and colours, beyond which it can be harmful. Strict actions and penalties are there for the offenders. FSSAI has also developed a simple, illustrated manual to detect common adulterants at home called DART- Detect Adulterants with Rapid Tests. This manual contains more than 40 tests that use simple ingredients such as water to test adulterants in food. This manual can be accessed from the weblink provided at the end of this chapter. These simple tests include physical inspection of food as well as chemical reactions. For instance, artificially coloured pulse grains will leave a colour trail when immersed in a glass of water. Pure silver leaves will crumble to a powder when crushed between fingers whereas aluminium used as an adulterant on mithai (sweetmeats) is not that delicate and will leave shreds. If powdered spices are sprinkled on the water surface, pure spices will not leave any saw dust/powdered bran on the surface of water. In case one finds that any food item is adulterated, one must stop using the food product and report this to the authorities.



Food Safety Magic boxes are being provided to the schools across different states in India. This magic box is a 'Do-It-Yourself' food safety testing kit, which aims to educate school children and frontline workers. Short videos are also available on the FSSAI video library (www.fssai.gov.in/fssaivideolibrary). It contains a small-sized, light-weight portable box that contains a few basic chemicals, a small measuring instrument, safety gadgets and a companion guidebook to illustrate testing across various food products in a pictorial and simplified manner. It can perform simple tests to detect adulterants like:

▶ **For milk:** Urea, water, starch, detergents

▶ **For honey:** Sugar

▶ **For beverages:** Mineral acids

▶ **For spices and condiments:** Starch and artificial colours

To further facilitate the usage of Food Safety Magic Box, a grade-wise lesson plan food safety guidebook for teachers has also been developed.