

## Wolf of Food Street: Food Adulteration and Water Contamination

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The following article is intended to create awareness among the consumers regarding food adulteration. The consumers should understand that the quality of product is more important than the quantity. This article covers some important Qualitative Tests to detect the presence of contaminants in the foodstuff which we consume in our daily life.

As adulteration is rampant everywhere, consumer should be aware of adulterators and one should take steps to safeguard themselves against those food items.

**Adulteration:** Adulteration of food consists of substituting it wholly or in part by any inferior or cheaper substance or removing any sort of its constituents wholly or in part which affect adversely the nature or quality of the product. Adulterants can be of two types:

- 1. Intentional adulterants:** Some manufacturers mix adulterants like brick powder, chalk powder, dried seeds, stones, marble, addition of harmful colors to food items like spices, pulses (metanil yellow in Turmeric or Carmoisine in Chili powder) with intention to make more profit.
- 2. Incidental adulterants:** is the contamination due to carelessness and lack of proper hygiene during overall processing of food. It includes contamination due to defective packaging and storage and may result in bacterial or fungal attack. Although, it's not possible to check for adulteration only on visual examination as adulterants are present in ppm or ppb levels. Following tests will help even a layman or non-technical person to detect adulterants in the some of the products.

**Chili powder:** Adulterants used can be brick powder, saw dust, synthetic colorants etc. Test to detect adulterant.

1. Take a glass of water (in transparent one).
2. Take a spoon of chili powder and sprinkle it on the surface of water.
3. If the powder settles down quickly at the bottom then it's unadulterated or if it takes time to settle down or forms thread like formations, then it's adulterated.
4. For checking presence of artificial coloring material we need to use Spectrophotometer available in food testing labs from which we can determine Cur cumin Content in Turmeric or ASTA color in Spices by checking absorbance at specific wavelengths.

**Milk:** Adulterants used can be water, starch, urea, sucrose, detergents, neutralizer, formalin etc. These adulterants are used to increase thickness, viscosity and shelf life of milk.

Presence of water can be detected by putting a drop of milk on polished slanting surface. Drop of pure milk will flow slowly leaving a white trail behind on the surface whereas adulterated milk will flow immediately without leaving any mark. You can also use Lactometer for measuring specific density of milk. Tests for checking presence of other adulterants in milk can be performed in lab with specific chemicals, reagents and prepared solutions like Iodine for starch, HCL for Sucrose, Ethanol and Rosalic acid, DMAB for Urea for checking presence of Neutralizer.

**Salt:** Adulterants used can be chalk or talc powder. Test to detect adulterant.

1. Mix a table spoon of salt in a glass of water.
2. If water will turn white then there is a presence of chalk powder.

**Tea:** Adulterants present can be tea leaves which are dried, powdered, colored.

1. Sprinkle the tea on a white colored filter paper and sprinkle water over it.
2. You can see some colored spots in yellow or red.

**Saffron:** Adulterant used is dried tendrils of maize cob. Genuine saffron won't break easily like artificial one. Artificial saffron is prepared by soaking a maize cob in sugar and coloring it with coal tar dye. The color dissolves in water if artificially colored. A bit of pure saffron when allowed to dissolve in water will continue to give its saffron color so long as it lasts.

**Edible oil:** Adulterants used can be Argemone Oil or Orthotricresyl Phosphate- a colorless industrial chemical freely soluble in oils but insoluble in water is used to adulterate some oils.

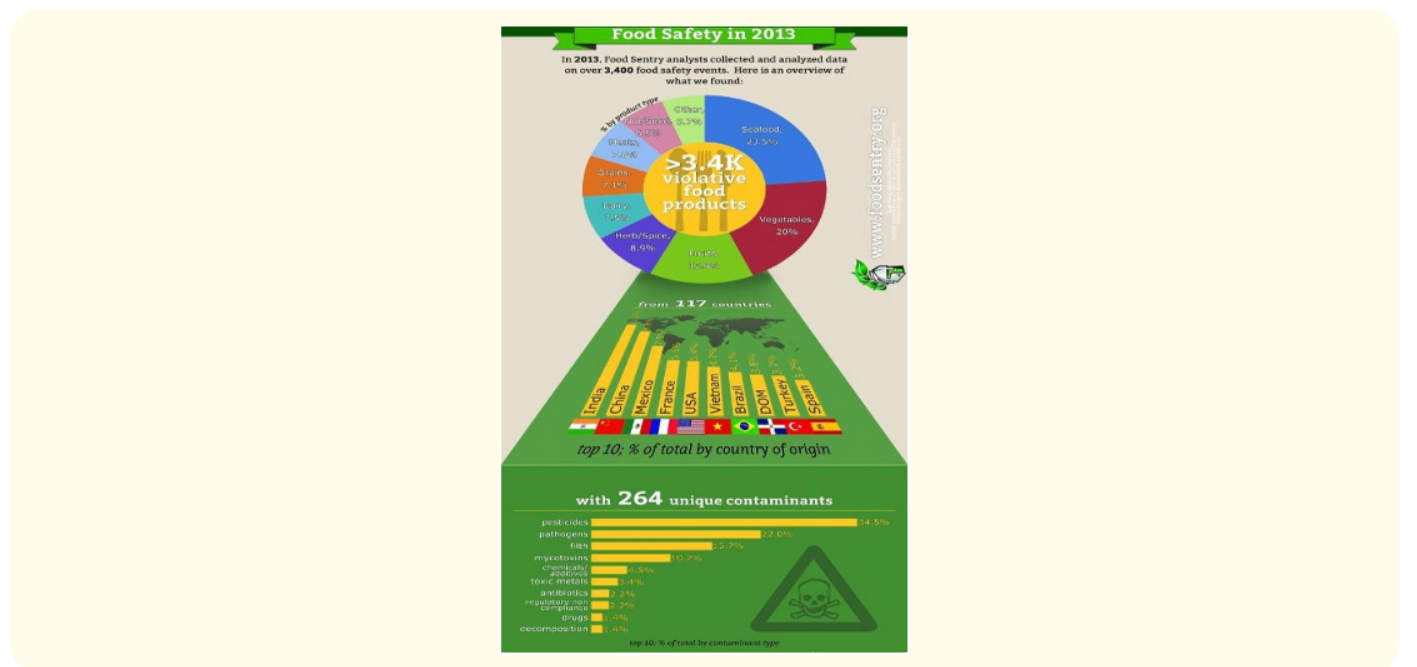
**Drinking Water:** Contaminants present in water can be heavy metals, detergents, pesticide residues, fecal matter etc. In a shocking disclosure around 29.2% populace in J&K are being supplied untreated tap water, a survey by NITI Aayog. Essential parameters needed for testing drinking water include; pH, Turbidity, TDS, Total Hardness, Chloride, Alkalinity, Fluoride, Detergents, Calcium and Magnesium etc.

Besides this, with the help of instruments like ICP-OES and GC-MS tests for heavy metals and pesticide residues can be quantified. QuEChErs Pouch method is latest in extracting pesticide residues from fruits and vegetables, cereal grains and even milk samples.

India is the world's worst food violator, reports a global source monitoring company- Food Sentry. China follows closely and the US is one of the top 10. One out of five food samples fails quality test in India, reports the FSSAI Annual Public Testing Report, 2014-15.

Foodborne diseases encompass a wide spectrum of illness and are a growing public health problem worldwide says WHO in its World Health Day 2015 report. 'How Safe Is Your Food'. Gastrointestinal, Neurological, Gynecological, Immunological to multi organ failure and even cancer can be caused by adulterated food. Adulteration methods are increasingly becoming more and more sophisticated while detection systems have to be advanced too. The infrastructure to check quality of food being consumed in J&K remains woefully shabby.

Need of hour is the establishment of full-fledged state of art facilitated NABL and BIS accredited food testing and analytical lab in J&K and recruitment of technical persons like Food Technologists, Food Analysts, Food Inspectors who can provide solutions to this growing menace so that whatever is being imported or manufactured locally should tested for quality and unscrupulous adulterators who are equally responsible for the rise of health ailments especially GI Tract diseases should be booked as per law. Consumer awareness is the first step to eradicate food adulterations from our state.



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