



Review Article

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Checkmate for Food Adulteration

Faheem B*, Hindustan Abdul Ahad, Chaitra P

Balaji College of Pharmacy, Ananthapuramu, Andhra Pradesh, India

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Abstract

The main objective of present article is to explore the commonly adulterated food materials and its method of detection. At the end of article one can know the simple methods to detect adulteration and simple methods to detect the adulteration.

Keywords: Food, adulterant, carcinogenic, adverse effects

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*Corresponding author

Faheem B

Balaji College of Pharmacy,
Ananthapuramu, Andhra Pradesh, India
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1. Introduction

The common grains viz., Bengal gram, rice and wheat etc., seeds and their powders viz., black pepper, Coffee powder, Coriander/Cumin/spice Powder, chilli Powder, Gram powder, Turmeric powder. Edible oils, Asafoetida were also get adulterated. Even Green vegetable, Honey, Ice cream, Jaggery, sugar were get adulterated. Even Milk and milk products (Paneer, khoya, curd, condensed milk, Rabri, Ghee) are not excused from adulteration. The adulterants used are having adverse effects from simple stomach disturbances to deadly cancers. This article gives the information regarding commonly used food materials which are adulterated intentionally (table1). The same table gives the information about the simple method to detect the adulteration.

Table1: Food material, adulterant, detection and adverse effect of adulterants

Food	Adulterant	Detection	Adverse effect
Asafoetida	Resin and colour	Add water, water get coloured	Carcinogenic
Bengal gram	Kesari dal	Kesari dal is wedge shape. It can be separated by visually	Carcinogenic
Black pepper	Papaya seeds	Papaya seeds float in water	Liver & stomach problems
Coffee powder	Tamarind seeds, chicory powder	Coffee float and Chicory/tamarind seeds sink in water	Diarrhea, giddiness, joint pains
	Cereal starch	Blue colour with iodine solution	Stomach disturbances
	Powder of scorched	Red colour with Na ₂ CO ₃	Stomach disturbances

	persimmon stones		
Coriander/ Cumin/spice Powder	Saw Dust	Spice powder sinks and saw dust floats in water	Stomach disturbances
Dried red chilli Powder	Rhodamine B colour	Cotton soaked in liquid paraffin when rubbed on surface get red colour	Carcinogenic
	Saw dust	Saw dust floats in water	Stomach disturbances
Dry turmeric root powder	Metanil yellow colour	Add Alcohol and HCl, gives Pink colour	Carcinogenic
Edible Oil	Prohibited colour	Add HCl, gives red colour	Carcinogenic
	Cyanide	Add alcoholic FeSO ₄ , Fe Cl ₃ and HCl, gives blue colour	Respiratory problems
	Mobil oil	Add dichloroquinol chloride, gives blue colour	Stomach disturbances
	Rancidity	Add HCl and phloroglucinol solution in ether, gives red colour	Diarrhea
	Metanil yellow colour	Add Alcohol and HCl, gives Pink colour	Carcinogenic
Ghee	Dalda	Add HCl and sugar, gives red colour	Diarrhea
	Metanil yellow colour	Add Alcohol and HCl, gives Pink colour	Carcinogenic
Gram powder	Kesari powder	Add distilled water and muratic acid and heat, gives Violet colour	Carcinogenic
	Metanil yellow colour	Add Alcohol and HCl, gives Pink colour	Carcinogenic
Green vegetable	Malachite Green	cotton soaked in liquid paraffin when rubbed on surface, get green colour	Carcinogenic
Honey	Invert sugar/jaggery	Ethereal layer of honey add resorcinol, gives cherry red colour Add Aniline Chloride, gives Orange red colour	Stomach and liver disorders
	Metanil Yellow	Add Alcohol and HCl, gives Pink colour	Carcinogenic
Ice cream	Washing powder	Add lemon drops, gives froth and bubble	Stomach and liver disorders
Jaggery	Metanil yellow colour	Add Alcohol and HCl, gives Pink colour	Carcinogenic
	Sodium bicarbonate	Add muratic acid, gives effervescence	Systemic alkalosis
Milk	Sodium bicarbonate	Add Rosalic acid solution, gives rosy colour	Systemic alkalosis
	Cereal starch	Iodine solution, gives blue colour	Stomach problems
	Urea	Red litmus paper turns to blue	Skin irritation
	Boric acid	Add HCl. Dip a turmeric paper. Colour changes from yellow to red. Later add NH ₃ , gives green colour	Acute boric acid poisoning
	Dalda	Add HCl and sugar, gives red colour	Stomach problems
	Starch	Iodine solution, gives blue colour	Stomach problems
Mustard Oil	Argemone Oil	Add HNO ₃ and heat, gives red colour	Tissue damage
	Cotton seed oil	Add Amyl alcohol, CS ₂ , S and heat, gives red colour	Increase blood cholesterol levels
	Mineral oil	Add alcoholic potash and heat and add distilled water, gives turbidity	Loose motions
	Castor oil	Add petroleum ether. Immersed in a salt-ice mixture or in a pot of cold saline water, gives turbidity	Loose motions
Mustard seeds and mustard	Argemone seeds	Crush the seeds, white colour inside	Glaucoma

oil			
Paneer, khoya, condensed milk and milk	Starch	Iodine solution, gives blue colour	Stomach disorders
Parched rice	Urea	Red litmus paper turns to blue	Skin irritation
Rabri	Blotting paper	Add HCl and water. Stir with a glass rod a fine fibers adhere to rod	Stomach disturbances
Rice	Soil, sand, grit, unhusked paddy, talc etc.	Visual examination	Stomach problems
Soda lemonade	Mineral acid	Dip, dry and dip metanil yellow papers, gives violet colour	Loose motions
Sugar	Starch	Iodine solution, gives blue colour	Stomach problems
Sweet curd	Dalda	Add HCl and sugar, gives red colour	Diarrhea
Tea Leaves	Iron Flakes	Magnet attracts Iron flakes	Constipation, black colour stool
	Leather Flakes	When burnt leather smell comes out.	Carcinogenic
	Coal Tar Dye	Moistened white blotting paper, when placed gets colour	Carcinogenic
Turmeric powder	Metanil Yellow	Add Alcohol and HCl, gives Pink colour	Carcinogenic
Turmeric	Metanil Yellow	Add Water and HCl, gives Pink/violet/purple colour	Carcinogenic
Wheat	Sand, bran, weed seeds	Visual separation	Stomach problems

2. Conclusion

The study concludes that simple tests in home every one can detect and gives check to food adulteration. To lodge a complaint with Food and Drug Administration (FDA) #341, Bandra-Kurla Complex, Bandra (E), Mumbai-400051. Phone 022- 26591463

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