

Identification of Common Food Adulterants in Selected Food Items Collected by Undergraduate Students

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Abstract—Healthy food is an essential part of a healthy life cycle. The quality and lifespan of a person depends upon the type of food he or she is consuming. Adulteration is the addition of foreign ingredients which lowers the quality of the food. Adulteration in essential food ingredients and staple food items can cause severe damage to human body. Adulterated food can cause diseases like anaemia, paralysis, cancer and when consumed in very large amounts it could lead to brain damage also. Adulteration could be accidental or purposeful. Poor handling and careless storage can also lead to adulteration. Adulterants like rhodamine dye used in red chilli, metanil yellow in turmeric, chalk powder in turmeric etc. are added to gain the financial profit. Adulteration needs to be avoided because a healthy and nutritious food is a basic right of all living beings. So to ensure that Indian government has issued an act named as "THE PREVENTION OF FOOD ADULTERATION ACT" in 1954. In this paper both physical and chemical tests were performed to detect the adulterants in the food items and beverages like tea, coffee, spices, oils and fats, heeng, turmeric, red chilli powder, besan, wheat flour, pulses (arhar daal), kesaridaal. The samples were procured from different places. Some have been taken from local markets near by south Delhi and east Delhi areas, some were ordered from groffers and some of them were taken from the college canteen. With the help of these simple tests the general public i.e. the local consumer can check the quality of food they are consuming. They can test it at their home easily and can choose the right quality food for them and their families.

Introduction

Food adulteration means addition of foreign substances or chemicals in food items (raw or cooked) for the purpose of unethical profit which could lead to destruction of food quality in terms of flavour and its nutritive values. Not only by addition, adulteration can be also be caused by removal of vital valuables ingredients. Vital substances are wholly or partially substituted by cheaper or inferior quality chemicals. Fresh vegetables, fruits, edible oils and spices etc which are a major part of our meal is adulterated by various methods like waxing/ dipping in some chemicals for early ripening or to make food item look attractive and fresh(1).

Food is a basic right to all humans, it should be free of contaminations like toxins and other hazardous substances. When a food product fails to meet the legal standards, it is said

to be adulterated(2) and food adulteration is a punishable offense as it not only affects the food standards but also cause harm to human health(3). To secure the safety of food for normal consumer or general public government of India has issued an act named 'THE PREVENTION OF FOOD ADULTERATION ACT 1954'. The act has been periodically amended to check the dishonest practices of traders. Food adulteration could be intentional (by adding unwanted chemicals) or could be unintentional (addition of unwanted dust, debris or insect attack during storage or transportation), but presence of any kind of adulterant can deteriorate the food quality and decreases its nutritive value. In many cases it leads to harmful diseases also.

Adulteration can be chemical or by physical means too. Some examples are when addition of Rhodamine dye to red chilli, addition of cyanide to edible oils, addition of artificial colour to tea and addition of clay to coffee etc. These could be very harmful for human consumption(4). Many fatal diseases like cancer can also be caused by addition of formalin to fish, meat and milk products. Heart diseases, blood cholesterol abnormality can be caused by adulterated edible oils. Various other diseases like bone marrow abnormality, neurological problems and skin disorders can also be caused by these adulterants. Since adulteration is a major point of concern, so the following paper contains methods and the result thereof for detection of adulterants in food items (mainly staple items) mainly collected from the local grocery stores by both chemical and physical means.

CONCLUSION-

Food adulteration is one of the silent explosions which is internally destroying our health. It is the act of intentional or accidental deterioration of the food quality, either by addition of the low-quality ingredients, substitution with similar food material or eradication or removal of valuable substances. In this experiment we observed that adulterated samples are not just restricted to local brands and also that through all the samples of the certain product say, coffee look alike and does not visually reflect any adulterant, most of the samples do

contain foreign material which can be detected with simple tests. These foreign material/particle (s) termed 'adulterants' may adversely affect the health if consumed regularly.

Hence, one needs to be cautious when buying any grocery food items and check for the presence of any adulterant(s) prior to its consumption. In this experiment, we have also demonstrated a certain test which doesn't require expertise and can be easily performed at home, like the test of detection of brick powder in red chilly powder ; papaya seeds in black pepper corns ; camphor or other foreign material(s) in asafoetida ; excess bran in wheat ; clay in coffee powder; any dye(s) in black tea or coffee; iron fillings in black tea leaves and many more for which huge volume of literature is available. Therefore without compromising with one's health one shall make an effort to check the presence of adulteration and also spread awareness of this problem and strategies to deal it with. One should also have the courage to raise voice against any such practice that one gets to know of.

Eat safe, stay healthy.

- [1]. Rapid detection of food adulteration and contaminants, Shyan Narayan Jha, 2016
- [2]. Recent advances in the detection of food adulteration, D. Banerjee, *Et al in food safety in the 21st century*, 2017.