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# **Food Adulteration: A Review**

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**Abstract:** Food is one of the basic needs for every living being and is very important aspect for life. But now a day's foods are affected by different adulterants. Adulteration is a substance which reduces the vital importance of food. Adulterants like metanil yellow (an artificial color) is used to intensify the color of the turmeric powder also adulterants like chalk powder, brick powder and toxic substances are added to gain profit and to lower the cost so as to compete with the market. Such adulterants can lead to anemia, paralysis, brain damage, stomach disorders and also cancer. Spices may also be contaminated because of conditions under which they are cultivated and harvested. Contaminated spices have been reported to cause certain food-borne illnesses and spoilage.

**Keywords:** food, adulteration, microbial contamination.

## **I. INTRODUCTION**

Adulteration in food is often present in its most crude form as prohibited substances are either added partially or wholly substituted. Contamination or adulteration in food is added for various reasons which includes financial gain, carelessness and lack in proper hygienic condition of processing, storing, transportation and selling. Therefore, the consumer is either fooled or usually become victim of diseases (Abraham *et al.*, 1997). In backward or developing countries, such kind of adulteration is usually seen. It is essential for the consumer to be aware of common adulterants and their effect on health (Acharya and Shah, 1999). Market has high number of food producers also food is imported in large amount which permits the producer to mislead and cheat consumer. There are producers who take advantage of legal rules and others who commit food adulteration and to differentiate between the two is extremely troublesome. Adulteration in foods not only decreases our social value but morality too (Ankleshwaria and Shah, 1999). The awareness of consumers plays important role in preventing food adulteration. Unawareness and unfair market behaviour might endanger consumer health and misleading can lead to poisoning. Therefore basic screening tests should be known to common people (Vasanthakalaam, 1996).

## **II. NATURE OF ADULTERATION**

Within the past few decades, adulteration of food has become one amongst the intense issues. Many agencies came upon by the Government of India to get rid of adulterants from food stuff. Screening of adulterated and non-adulterated food is important for daily life to make sure that such foods don't cause any health problems (Babu and Shenolikar, 1995). Toxic contaminants are present in ppm level therefore, it's impossible to make sure wholesome food solely on visual examination (Rao, 1994). However, visual examination of the food before purchase bounds to guarantee absence of insects, visual flora, foreign particles etc. In addition, label declaration on packed food is very important in order to know the ingredients and its nutritional value (Babu and Shenolikar, 1995). It also helps in checking the freshness of the food and the period of best before use. The buyer must avoid taking food from a place which avoids hygienic conditions. Food purchased from unhygienic places may cause various diseases (Anyawu and Jukes 1990). Fruits that are being peeled off or cut before selling should not be purchased from unhygienic conditions. It is perpetually better to buy certified food from acknowledged shop.

During different festivals also people use varied composite food colours in excess that cause toxicity (Rao *et al.*, 2005). Before using any type of intentional or unintentional adulterant an initial risk analysis should be done (Mathur, 2000) Based on the type of contamination, intention of the producer and processing methodology, adulteration can be divided into 3 types. :

### **A. Intended Adulterants**

It may include adulterants like sand, marble chips, stone, water, coal tar dyes, mud, mineral oil and chalk powder. Such adulterants harm the human body.

### **B. Metallic Contamination**

Metals like arsenic, lead and tin that are present in pesticide, water and cans respectively are responsible for metallic contamination

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of food products. Such adulterants unintentionally become a part of food during processing (Pappi and Murugesan, 2004).

### C. Accidental Adulterants

Accidental adulterants are pesticides residues, dropping of rodents, larvae in foods, etc. Metallic contamination with arsenic lead, mercury can also occur accidentally. Accidental adulterants also involve pests such as rodents and insects that trespasses the food at high degree and produces impurity in the form of excreta, bodily secretions and spoilage through micro-organisms. Most common accidental adulterants are pesticides, D.D.T. and residues present on the plant product (Pandit *et al.*, 2002). Maximum permissible limit for D.D.T. is 3 ppm which sometimes is over crossed (Kannan *et al.*, 1997).

### III. IMPACT OF ADULTERANTS

Now-a-days it is very common to hear or read news about the food items being adulterated and such products are being openly sold out and are consumed by people, which cause various health hazards. News has shown how milk and milk products are being adulterated with urea, soap and other hazardous chemicals (Kalra *et al.*, 1999; Venkateswar, 2001). Also vegetables are being injected to make them grow overnight. In chickens, steroids were being injected to make them into a hen in a very short period of time. Bacteriological profile of street foods in Managlore was also done whose results were in accord (Bhaskar *et al.*, 2004). Adulteration of food leads to several health issues in humans (Nageswararao *et al.*, 1989; Bhatia *et al.*, 1999). Few health hazards include stomach ache, body ache, anaemia, paralysis, and increase within the incidence of tumors, pathological lesions in very important organs, abnormalities of skin and eyes (Shah *et al.*, 1999). Thus food adulteration ought to be very important because of its impact within the health significance of the public (Beniwal and Khetarpaul, 1999). The individuals are laid low with heart disease, kidney failure, skin diseases, asthma attack and alternative chronic diseases. The individuals are unfortunate victims of this adulteration trade running in full swing and uncurbed.

### IV. RELATED CASES

#### A. Case 1

In Chennai, a commercial shop was inspected for the standard products and the result shows that the products sold were adulterated and it was sold in the name of branded products. About 70% of adulteration was seen in oils and ghee and 10% in masala products (Abhirami and Radha, 2015). Adulterants like metanil yellow (an artificial colour) is used to intensify the colour of the turmeric powder and saw dust are added to increase the quantity of turmeric powder for gaining more profit.

#### B. Case 2

A study was carried out on the microbiological quality of the spice mix used in the production of Kilishi. Kilishi is a sun dried spiced and grilled meat snack that can be kept for significantly longer duration without getting spoiled because of its dry nature. Application of spice is one among the foremost vital stages throughout the production of kilishi since it has a critical control point (Shamsuddeen and Ameh, 2008). According to International Standard Organization, spices could be defined as the natural vegetable product or mixtures without any extraneous matter that is used for flavoring, seasoning and imparting aroma to foods (ISO, 1972). Spices like other food substances, may carry some bacteria, yeast, mould spores and even some insects. The predominant flora is usually composed of aerobic spores and non spore forming bacteria, indicator organisms and a few pathogens may also be found (ICMSF, 1986). Coliforms from mixed spices were isolated and characterised to be *E. coli*, *Klebsiella* spp, *Pectobacterium* spp and *Enterobacter* (Patel *et al.*, 1976). According to Frazier and Westhoff (2006), spices don't have a marked bacteriostatic effect in the concentrations used in meat products and they may even serve as source of contamination of processed products.

#### C. Case 3

This study evaluated the presence of adulterant from daily used food materials like pulses, wheat flour, black pepper, chilli powder and coffee powder which were collected from different departmental and local grocery stores and were checked for the presence of different adulterants through biochemical qualitative analysis. According to the reagents added the colour of the sample changed which indicated the presence of various adulterants (Shruti *et al.*, 2014).

#### D. Case 4

Another study was done in which 15 packed and 27 unpacked spice samples of three kinds- red pepper, turmeric and coriander were

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collected from different markets and bazaars in Bangladesh. Standard microbiological analysis was carried out for the detection and enumeration of microorganisms using standard media. Results were compared with International Microbiological Standard which showed that few microbiological parameters of unpacked sample were higher than the recommended limits (Parveen *et al.*, 2014). Therefore, it's suggested to keep up good sanitary practice and hygienic quality throughout production stages of spices in our country.

### V. CONCLUSIONS

From the above review and discussions lastly we can summarize that the adulteration which is been added in the food items can cause tremendous affect on health without our knowledge. Adulteration can be prevented by few alerting steps of our society. Hike of price of food items should be checked by government. While purchasing food items, selection of wholesome and non-adulterated food is necessary to make sure that such food do not cause and health problems. Though presence of adulterants cannot be ensured by visual examination as toxic contaminants are present in very low level but visual examination before purchase can ensure absence of insects, fungus and other foreign materials. The consumer should avoid buying food from places which do not maintain proper hygiene conditions. Both local and branded food stores should be inspected by government bodies. The above general consciousness is simple and easy to initiate for our healthy life. If we tend to actively participate in these changes then we can bring about a healthy and non venturous future for the upcoming generations.

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