

IMPACT OF ADULTERATION ON FOOD AND HUMAN

Vikas Rana

Assistant Professor

School of Hospitality

Vivekananda Global University Jaipur (India)

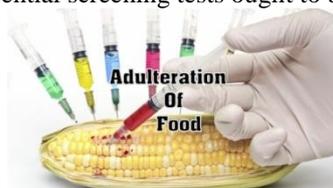
Abstract:- Food is one of the essential requirements for each living being and is very important aspect for life. However at this point multi day's sustenance's are influenced by distinctive adulterants. Adulteration is a substance which decreases the crucial significance of nourishment. Adulterants like metanil yellow (an fake shading) is utilized to escalate the shade of the turmeric powder additionally adulterants like chalk powder, block powder and dangerous substances are added to pick up benefit and to bring down the expense in order to contend with the market. Such adulterants can prompt paleness, loss of motion, cerebrum harm, stomach issue and furthermore malignancy. Spices may also be debased in view of conditions under which they are developed and collected. Debased spices have been accounted for to cause certain nourishment borne ailments and decay.

Keywords:- Food, Adulteration, Contamination, Disease, Nutrition, Adulterants.

1:1-Introduction

Food adulteration refers to the process by which the quality or the nature of a given food is reduced through addition of adulterants or removal of vital substance. Food adulterants refer to the foreign and usually inferior chemical substance present in food we eat, that cause health related disease. To improve the appearance of the food non nutritious substances are added into the food. Texture and storage properties of the food adulteration are common in the developing countries.

Contaminated in nourishment is frequently present in its most unrefined structure as denied substances are either included incompletely or completely substituted. Defilement or corruption n nourishment is included for different reasons which incorporates monetary profit, thoughtlessness and need in legitimate sterile state of preparing, putting away, transportation and moving. Thusly, the customer is either tricked or typically progressed toward becoming casualty of illnesses. In reverse or creating nations, such sort of corruption is generally observed. It is fundamental for the purchaser to know about normal adulterants and their impact on wellbeing . Market has high number of nourishment makers additionally sustenance is imported in extensive sum which allows the maker to misdirect and swindle buyer. There are makers who exploit legitimate guidelines and other people who submit sustenance debasement and to separate between the two is amazingly troublesome. Debasement in sustenance's diminishes our social incentive as well as profound quality as well. The consciousness of purchasers assumes imperative job in avoiding nourishment defilement. Ignorance and uncalled for market conduct may jeopardize buyer wellbeing and misdirecting can prompt harming. Thusly essential screening tests ought to be known to average folks.



1:2-Nature of Adulteration

From last few years, adulteration of food has become one amongst the intense issues. there are many agencies came upon by the Govt of India to get rid of adulterants from the food stuff. Screening of adulterated and non adulterated food is important for daily life to make sure that such food stuff don't cause any health problems. Toxic contaminants are present in ppm(Parts Per Minute) level therefore, it is impossible to make sure wholesome food solely on visual examination. 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 to know the ingredients in order to know the ingredients and its nutritional value. It also help in checking the freshness of the food and the period of best before use. The buyer must avoid to take food from a place which avoids hygienic conditions. Food purchased from unhygienic place may cause various diseases. Fruits that are being peeled off or cut before selling should not be purchased from unhygienic conditions. It is better to buy certified food from acknowledge shop. In different festivals people also use varied colours in excess that cause toxicity. Before issuing any type of intentional or unintentional adulterant an initial risk analysis should be done .Based on the type of contamination, indentation of the producer to processing methodology.

1:3-Objective of Food Adulteration

- To explore the chemical existing in edible items.
- To motivate the students to become more health conscious.

- To be able to prepared healthy food.
- To know about the bio-fuel, organic grading to make the word pollution free.
- To become versed in laboratory work and reading and also measure the adulteration in selected food.
- To study buying practices.

1:4-The Food is considered to be Adulterant if

- It does not meet the nature of the substance or quality as per the demand of the consumer.
- The food contains inferior or cheaper substance.
- The food has been prepared, packed or kept under unhygienic conditions leading to contamination.
- Food contain substance that depreciates or injuriously affect the health.
- The nature of the food is substituted wholly or partially by abstracting a portion of vital substances from food.
- If it is an limitation of some other food substance.
- The food sold by the bender is not of the nature, substances or quality demanded by the purchaser or not of the nature.
- The food contain any other substance which affect, or if the food is so processed as to affect .
- Any cheaper material has been used wholly or in part.
- The food obtained from the disease animals.
- The food contains any poisonous or harmful material.
- The food contained any prohibited preservative.
- The quality or purity of the article falls below the prescribed standard.
- The substance which is added is injurious for human consumption.

1:5-Food Adulteration Causes:-

- Profit motive of traders-Done as a part of the business strategy.
- Food Insecurity-To increase quantity of food production and sales.
- Increased Urbanization- To make maximum profit from food items by fewer investments.
- High Population Demands- Increased food demand of the population and its changing trends.
- Illiteracy of general public –Lack of consciousness of proper food consumption.
- Lack of effective food laws.
- Lack of government in initiative.

1:6-Food Adulteration Types:-

There are three types of food adulteration.

- Intentional adulteration:-In intentional adulteration the adulterant are added as a deliberate act with intention to increase profit. Example- Sand, marble, chips, stones, chalk, powder etc.
- Incidental adulteration:-In this type of adulteration adulterant are found in food due to negligence, ignorance or lack of proper facilities. Example- Packing hazards like leave of insects, droppings, pesticide residues etc.
- Metallic adulteration:- When the metallic substance are added intentionally or accidentally into the food.
- Example-Arsenic, pesticides, lead from water, mercury from effluents, tins from cans etc.

1:7-Food Adulteration A Rising Problem In India:-

Food adulteration has become rampant in India. Fruits , Vegetables will be contaminated. Soft drinks and Dairy products too and all this so that the consumer can save a few rupees. Food adulteration in India starts from the field itself where fertilizers and pesticides overused. Pesticide residues are not the only problem. Many product used in everyday cooking such as-colouring agents, cheese, clarified butter etc. The use of carbide to make fruit ripen faster has created a number of health diseases.

Young and old are the most affected by these toxins in food. Some people say that in a country where 40% people lives below poverty line, there should be less stress on adulterated food and more on the fact that people should have enough food to eat.

Although law exists to control and monitor the food industry. We only hope for that the new safety and standards act will bring some positive changes and with the coming of these acts a whole structure will be revamped, more awareness has been generated and people are realizing how important food safety for them and their health. In India population play a important role in food adulteration, to meet the requirement of the people adulterant are used to complete the daily needs. But beside that people have to know that which thing is good for them or for their health. Never use adulterant in excessive manner.

1:8-List of food Stuffs with the adulterants and Health Effect:-

Adulteration In Food Stuff			
S.No	Name of Food item	Adulterants	Health Effect
1	Mustard seed	Argemone seed	Epidemic dropsy
2	Edible oil and fat	Argemone Oil	Glaucoma cardiac arrest
3	Cumin Seed	Artificial colour foreign seeds	Injuries to health
4	Black pepper	Artificial colour foreign seeds	Injuries to health
5	Poppy Seed	Artificial colour foreign seeds	Injuries to health
6	Tea	Exhausted seeds, foreign seeds	Injuries to health Cancer
7	Oils	TCP	Paralysis
8	Food grain and pulses	Sand, Marble chips, Stones	Damage digestive Track
9	Khesari dal	Lathyrus sativus	Lathyrism

Chemical Contamination:-			
10	Edible oil and fat	Mineral oil	Lead to cancer
11	Black pepper	Petroleum fractions	Lead to cancer
12	Turmeric whole and powdered	Lead chromate	Anemia, paralysis, brain damage
13	Alcoholic liquors	Methanol	Blurred vision, blindness, death
14	Apple	Arsenic	Dizziness, cramps, paralysis
15	Fruit Juice and Soft drinks	Cadmium	Increase salivation, Liver and kidney damage
16	Water natural and processed food	Lead	Lead poisoning, insomnia, anemia
17	Food	Copper, tin and zinc	Vomiting, colic
18	Mercury contaminated fish	Mercury	Brain damage, death
19	Cereals products, custard, pudding, sauses	Bacillus Cereus	Food infection, Nausea, Vomiting, Abdominal pain
20	Meat and meat products, raw vegetables, shell-fish, eggs	Salmonella spp	Salmonellosis, Food poisoning
21	Milk, potato, Beans, Poultry, Tuna, Shrimp ,moist mixed food	Shigella Sonnei	Shigellosis (bacillary desentery)
22	Dairy products, baked food, custard, cream, chilled food, meat and meat products, frozen foods etc.	Staphylococcus aureus entero- toxins-A, B, C, D or E	Increased salivation, vomiting, abdominal cramp, severe thirst.
23	Smoked Food	3, 4 Benzopyrene	Leads to Cancer
24	Solvent extracted oil, oil cake etc.	Excessive solvent residue	Carcinogenic effect
25	Coloured Food	Non permitted colour or beyond safe limit	Mental retardation, cancer and other toxic effect.
26	Oils and Fats	BHA and BHT beyond safe limit	Allergy, liver damage, increase in serum cholesterol.
27	Chinese foods, meat and meat products	Monosodium glutamate beyond safe limit	Brain damage, mental retardation
Fungal Contamination:-			
28	Ergot-infested bajra, rye, meal or bread	Ergot alkaloids from Claviceps purpurea	Ergotism, itching of skin
29	Aspergillus flayus-contaminated food such as groundnuts, cottonseed etc.	Alfatoxins	Cancer , leaver damage
30	Yellow rice	Toxins from penicillium inslandicum, citreovirede, rhizopus	Toxic mouldy rice disease

1:9-Method of Food Adulteration:-

- **Mixing:** Mixing of clay, stones, pebbles, sand, marble chips etc.
- **Substitution:** Cheaper and inferior substance being used or replaced wholly or partially with good ones.
- **Concealing Quality:** In this method they tried to hide the food standard. Example-adding captions of qualitative food to law quality for selling.
- **Decomposed Food:** It happen mainly with fruits and vegetables. The decomposed ones are mixed with good ones.
- **Misbranding/False labels:** It includes duplicate food stuffs, changing of manufacture and expiry dates.
- **Addition of toxicants:** Adding non-edible substance like argemone in mustard oil, low quality preservatives, colouring agents etc.

1:10-Checking of Food Adulterant with example

S.No	Food Name	Adulterant	Test of Adulterant
1	Coconut Oil	Any other oil	Refrigerate the oil. Coconut oil will solidify leaving the rest of the oil / adulterant in a separate layer.
2	Mustard Seed	Argemone seeds	When pressed or crushed, argemone seeds are white inside and have a rough outer surface , while mustard seeds are smooth on the outside and are yellow on the inside.
3	Ice Cream	Washing powder	Squeeze a few drops of lemon juice on the ice cream. If it starts to froth and bubble, it has washing powder in it.

4	Black Pepper	Papaya seeds	Put a sample in alcohol. Pepper seeds will sink & papaya seeds will float as they are lighter.
5	Coffee	Tamarind seeds, chicory powder	Gently sprinkle coffee powder on the surface of water in a glass. The coffee will float whereas chicory will start to sink within a few seconds. Falling chicory powder will leave a trail of colour behind due to the large amounts of caramel it contains.
6	Honey	Water / sugar solution.	A cotton wick dipped in pure honey when lit with matchbox /lighter will burn giving its purity but if it is adulterated the water content won't allow it to burn.
7	Sugar	Chalk powder	Mix a sample with a glass of water. Sugar will dissolve chalk powder will settle down.On dissolving in water it gives a smell of ammonia.
8	Sago	Talcum powder/sand	Burn the sago, if pure it will swell & hardly leave any ash. If adulterated will leave behind good quantity of ash.
9	Bajra	Ergot infested bajra	Soak in water all the adulterants will float.
10	Salt	Chalk powder	Mix a sample with a glass of water. Salt will dissolve chalk powder will settle down.
11	Cloves	Coated with mineral oil	If coated with mineral oil it gives kerosene like smell
12	Sweet Potatoes	Rhodamine b colour	Take a cotton piece, soak in paraffin & rub over outer surface of the vegetable. If the cotton absorbs the colour we say that vegetable is adulterated by rhodamine b colour.
13	Peas	Artificially coloured	Take 250ml of water in a beaker soak peas into it. Clear separation of colour in water shows adulteration.
14	Green Chillies	Malachite green	Take a cotton piece, soak in paraffin & rub over outer surface of the vegetable. If the cotton turns green we say that vegetable is adulterated by malachite green.
15	Dals or turmeric powder	Metanil yellow, Kesari dal.	Dissolve a spoonful of turmeric powder or besan in 20 ml of lukewarm water. Add any acid easily available at home like lemon (acetic acid), oranges (citrus acid) or any ascorbic acid (vitamin C fruits). If the water change its colour, it is adulterated.

1:11-Adulteration Effect On Food & Human

- It's highly carcinogenic and can lead to stomach disorders if consumed continuously.
- It can cause severe stomach and liver disorders
- These can cause diarrhea, stomach disorders, giddiness and severe joint pains.
- Highly toxic to human body.
- Affects the quality of the product.
- Food colour that is added to the items can be the reason of allergies, liver damage and many more health related disease.
- Mixing of oil can lead to quality problems & heart problems if non edible oils are mixed.
- Adulteration leads to chronic health problems.
- It also decreases the nutritional value of the food.
- It increases the impurity in the food.

1:12-Prevention

The best way to avoid health problems is prevention. We can take many steps to ensure this. We need to take interest in the place where we buy our food, for example, is it from repudiated shop or a retailer, we need to check out. We also need to check if these outlets regular checked by the food inspector and if the premises are kept clean with no infestations. We need to check that the packing is intact and the expiry date and the source of the product. It is also important to talk regularly with the local community to check if people are falling sick after eating in a particular restaurant or food ingredients bought from a particular shop or retailer. We should also need to aware in the local community on the ill effects of food adulteration so that when this type of incident happens the public knows when to seek help. We also to take care that the contamination could we happen in small amount over a period of time. So it is prudent that every one of us takes interest in this subject and educates or families, friends and colleagues about this menace. Only then we can improve or take care yourself or others. Thus we only say that the adulterant food is not good. So avoid ready-made food, clean and wash the vegetables and fruits before eating and prepared healthy food at home, precaution is the only way to prevent from health diseases.

Conclusion:-

From the above review and discussions 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. The demanding consumers and increasing number of food producers are the main reason to mislead the pattern of food safety. The imported food stuffs enables the producers to cheat the consumers. The consumers also ready to buy those products. To differentiate of those who take advantage of legal rules from the once who commit food adulteration is very difficult. The critical analysis of the consumers be me very strong enough to investigate and enquiry the specifications. In addition, ignorance and unfair market behaviours is endangering consumer health. There exist only little information about the food adulteration and contamination in our country. The institutions which are concerned especially in this field such as All India Institute of Hygiene & Public Health and Indian Council of Medical Research must conduct various researches on the concept of human health and challenges faced when the contaminated products are intake and its impact and consequences. food production and processing, marketing system and urbanisation which have rapid growth. At present, it is important to take a serious note and its the needy to safe the agriculture, animal husbandry and measure to control the harvesting process before and after losses,. It also implies that more efficient food processing and distribution systems, and application of biotechnological techniques which can make foods not only readily available but free from adulteration and contamination. It leads to various food-borne diseases and it may become as a health hazard.

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