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Food Adulteration w.s.r. to Garavisha

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Abstract: ***In Ayurveda food is one among the trayopasthambha (pillars of life)[1]. Health and diseases both are dependent on food. In todays World food is adulterated with poorer quality ingredients for economic advantages. Due to adulteration in food can lead to serious illness. Food adulteration leads to lower the nutritive value of food either by removing a vital component or adding susbstance of inferior quality. Adulterants when used in illicit drugs are called cutting agents, while deliberate addition of toxic adulterants to food or other products for human consumption is known as poisoning. The combination of different poisonous or non-poisonous substances resulting in deteriorating effects on health comes under the concept of garavisha in Ayurveda[2]. One of the forms of garavisha is vishayuktaanna. Its effects may include anaemia, emaciation, GIT problems, neurological problems, liver disorders, oedema etc.***
This article will give an approach to find out solutions for food adulteration through ancient science.
Keywords: food adulteration, garavisha, adulterant.

I. INTRODUCTION

Food adulteration can be defined as the addition of cheaper, inferior, harmful, or unnecessary substance to food that could affect the nature and quality of the original food[3]
As per FSSAI the percentage of adulterated food has increased from 12.8% in 2011-12 to 28% in 2018-19.
Adulteration is a legal term meaning that a food product fails to meet federal or state standards.
Different Types of Food Adulteration are[4]:
Intentional: Sand, marble chips, stones, mud, other filth, talc, chalk powder, water, mineral oil.
Incidental: Pesticide residues tin from can, droppings of rodents, larvae in foods.
Metallic contamination: Arsenic from pesticides, lead from water, mercury from effluent, from chemical industries, tins from cans.
Packaging Hazards: Polyethylene, polyvinyl chloride and allied compounds are used to produce flexible packaging material.
Garavisha can be the combination of different body parts of animals or their waste, incompatible medicines or metallic bhasma, poisons which are low in potency[5].
Those poisons that are artificially prepared by the combination of substances for the purpose of creating poisonous effect and those which result in diseases after a period of time are called garavisha[6].
Garavisha is said to be the addition of any body parts or waste products of any living beings nanapraniangaamsa mala[7].
Any form of incompatible drug combination or less potent toxins that my get into our daily utensils accidently or intentionally, will definitely harm the consumers. The food, drinks, medicine.etc.are now taken along with concocted poison.
Common symptoms and diseases that are produced as a result of garavisha are described in its context. They include[8] panduta(anemia),krushata(malnutrition),alpagni(weak digestive power), kasa(cough), shwasa(asthma/respiratory diseases), jwara(fever/infections),ardita(facial palsy) vayupratilomagati (neurological symptoms), atichinta(anxiety), mahodara(ascites), yakrutroga(liver disorders), pleeharoga(spleen disorders), deenavak(weak voice), durbala(reduced body strength), alasa(lassitude), shopha(edema), satataadhmana(blotted abdomen) shushkapadakara(dry hands and feet), kshaya(emaciation), specific mental symptoms viz typical dreams and delusional symptoms etc.
There can be adulteration with poisonous substances like heavy metals, chemical colouring agents, pesticide residue etc .or with non-poisonous substances like water, starch, stones, same substance with inferior quality
etc.

II. SOME ADULTERATED FOODS AND THEIR HEALTH HAZARDS

1) Turmeric, dals and pulses
• Adulterant: Metanil Yellow and Kesari Dal
Health hazard: highly carcinogenic, stomach disorders.

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2) Green chilies, green peas & other vegetable

• Adulterant: Malachite Green, Argemone seeds

Health hazard: carcinogenic.

3) Mustard seeds and mustard oil

• Adulterant: Argemone seeds, Papaya seeds

Health hazard: epidemic dropsy and severe glaucoma.

4) Paneer, khoya, condensed milk and milk

• Adulterant: Starch and water

Health hazard: stomach disorder.

5) Ice cream

• Adulterant: Pepperonil, Ethylacetate, Butraldehyde, Nitrate, Washing powder, etc.

Health hazard: Pepperonil is used as a pesticide and ethyl acetate causes diseases affecting lungs, kidneys and heart.

6) Coffee powder

• Adulterant: Tamarind seeds, chicory powder.

Health hazard: diarrhea, stomach disorders, giddiness and severe joint pain.

Alcoholic liquor is adulterated with methanol

Health hazards: Blurred vision, blindness, death.

Cream is adulterated with gelatin, and formaldehyde is employed as a preservative for it.

- Butter is adulterated to an enormous extent with oleomargarine, a product of beef fat.
- Brick dust in chili powder, coloured chalk powder in turmeric. This can cause stomach disorders.
- Pickles and canned vegetables are sometimes colored green with copper salts.

Preventive Measures: it is having 2 categories

a) Food Standard:

AGMARK standard: AGMARK, or Agriculture Mark, is the certification mark to assure the quality of agricultural products in India. AGMARK acts as a third party guarantee for the agricultural products that are produced and consumed in India.

Bureau of Indian Standards: The Bureau of Indian Standards (BIS) is the National Standard Body of India. BIS is responsible for the harmonious development of the activities of standardization, marking and quality certification of goods and for matters connected therewith or incidental thereto.

PFA Act (1954) By the Central committee of Food standards, the standards have been established which are revised time to time and to obtain a minimum level quality of foodstuffs attainable under Indian condition.

b) Legal Measure:

The PFA Act states that an article of food shall be deemed to be adulterated[10]:

- If the article sold by a vendor is not of the nature, substance or quality demanded by the purchaser, and is to his prejudice, or is not of the nature, substance or quality thereof.
- If the article contains any other substance which affects, or if the article is so processed as to affect injuriously the nature, substance or quality thereof.
- If any inferior or cheaper substance has been substitutes wholly or in part of the article so as to affect injuriously the nature, substance or quality thereof.
- If any constituent of the article has wholly or in part been abstracted so as to affect injuriously the nature, substance or quality thereof.
- If the article has been prepared, baked, or kept under insanitary conditions whereby it has become contaminated or injurious to health.

- If the article consists wholly or in part of any filthy, putrid, disgusting, rotten, decomposed or diseased animal or vegetable substance or is insect infested or otherwise unfit for human consumption.
- If the article is obtained from a diseased animal.
- If the article contains any poisonous or other ingredient which renders it injurious to health.
- If the container of the article is composed whether wholly or in par, of any poisonous or deleterious substance which renders the contents injurious to health.
- If any colouring matter other than that prescribed in respect thereof and in amounts not within the prescribed limits of variability is present in the article.
- If the article contains any prohibited preservative or permitted preservative in excess of the prescribed limits.
- If the quality or purity of the article falls below the prescribed standard or its constituents are present in quantities which are in excess of the prescribed limits of variability.

Tests for detecting adulteration[11]:

➢ Milk

Detection of water in milk: Put a drop of milk on a polished slanting surface. Pure milk either stays or flows slowly leaving a white trail behind. Milk adulterated with water will flow immediately without leaving a mark.

Detection of detergent in milk: Take 5 to 10 ml of sample with an equal amount of water. Shake the contents thoroughly. If milk is adulterated with detergent, it forms dense lather. Pure milk will form very thin foam layer due to agitation.

Detection of starch in milk and milk products (khoya, chenna, paneer): Boil 2-3 ml of sample with 5 ml of water. Cool and add 2-3 drops of tincture of iodine. Formation of blue color indicates the presence of starch. (In the case of milk, addition of water and boiling is not required).

➢ Honey

- Take a tablespoon of honey and put it in a glass of water. If the honey dissolves, then it is not pure. Pure honey should stay together as a solid when submerged in water.

- Take a bit of honey and mix it with water. Then place four or five drops of vinegar into the solution. If it turns foamy, the honey might have been adulterated with gypsum.

- Scoop a bit of honey into a spoon and let it fall from the spoon. Honey with high water content will fall quickly. Mature honey of good quality will stay on the spoon or fall very slowly.

- Light a match and try to burn some of the honey. If it lights and burns, then it is pure. Impure or low-quality honey often contains extra water that keeps it from burning.

- Take some honey, mix it with water, and add a few drops of iodine. If the solution turns blue, then the honey has been adulterated with some sort of starch or flour.

- Take a small piece of old, hard bread and submerge it in the honey. After removing it 10 minutes later, if the bread is still hard, then the honey is pure. If there is a lot of water in the honey, the bread will soften.

➢ Coconut oil

Detection of other oils in coconut oil: Coconut solidifies when cooled and this property can be used to check the adulteration of other oils in it. Take a transparent glass and keep in the refrigerator. After a few hours, the coconut layer will solidify and there will be a separate layer if it has adulteration of other oils.

➢ Sugar

Detection of chalk powder in sugar: Take a glass of water and add a spoonful of sugar. Sugar will dissolve in water and chalk powder being heavier will settle down.

➢ Spices

Detection of colour in red chili powder: Artificial colour will leave a streak the moment red chili powder is added to water and the pure one will just float on the surface leaving no immediate streak.

Detection of colour in turmeric: Pure turmeric, when added to water will settle down leaving light yellow colour while synthetically coloured turmeric powder will leave a streak of dark yellow colour.

III. MANAGEMENT

Garavisha is often eating unknowingly hence the person doesn't feel any symptoms immediately.

Vaman[12]: Tamra Chooran mixed with honey is beneficial for hridaya shudhhi. It should be followed by administering gold chooran with honey as gold counteracts all poisons.

Sharkaraa Suvarnadi leha[13] – Suvarnamaakshika and Suvarna Bhasma given with sugar and honey.

Moorvaa, Guduchyadi choorna[14] - Choorna of Moorvaa, Pippalee, Gudoochee, Tagara, patol, Chavya, Chitraka, Vachaa, Mustaa & Vidanga with Takra / Ushnodaka / Mastu / Amlarasa.

IV. DISCUSSION

Food adulteration can be corelated with garavisha as garavisha also includes combination of poisonous (metals, chemicals etc.) and non-poisonous substances like water, starch and same substance with inferior quality. This can also be accidental and incidental. There are many symptoms or disease occur due to consumption of adulterated food. In ayurvedic perspective garavisha also cause many health-related problems similar as food adulteration as follows;

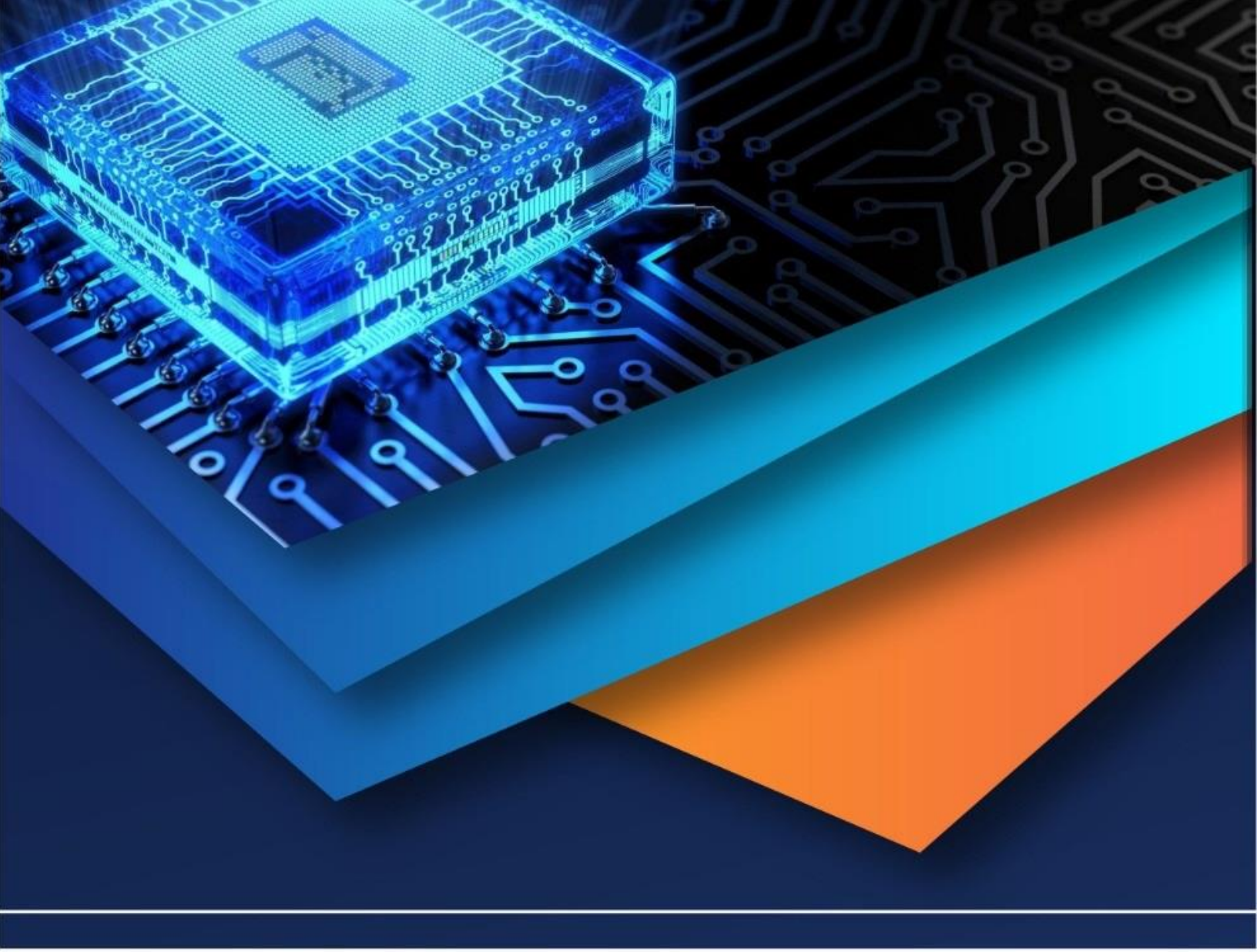
panduta(anemia),krushata(malnutrition),alpagni(weak digestive power), kasa(cough), shwasa(asthma/respiratory diseases), jwara(fever/infections),ardita(facial palsy) vayupratilomagati (neurological symptoms), atichinta(anxiety), mahodara(ascites), yakrutroga(liver disorders), pleeharoga(spleen disorders), deenavak(weak voice), durbala(reduced body strength), alasa(lassitude), shopha(edema), satataadhmana(blotted abdomen) shushkapadakara(dry hands and feet), kshaya(emaciation).

V. CONCLUSION

Food is one of pillar of life. By the study of food adulteration found that widely use of adulterants which can cause serious health hazards. Food adulteration is effecting most part of the population due to marketing and globalisation. this can be corelated with garavisha, So we can manage its health hazards with the help of ayurveda. Every person should be aware about identification and effects of adulteration. Need of checking ISI and AGMARK of food items. Need of strict enforcement of food law. Further studies can be done to find easy and quick methods to identify adulteration.

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