

FOOD ADDITIVES: SILENT KILLER

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ABSTRACT

Our body is the product of food (*ahara*) and it is known as a sustainer of life. Ayurveda always put stress on positive health. *Ahara* (diet), *Nidra* (Sleep), *brahmacarya* (abstinence of sense organ) are known as the three *Upastambhas* (*pillar*) and important for the smooth functioning of life. The food has limited shelf life, for the maintainance of the shelf life, and to maintain the quality of food preservatives are required. These preservatives may be hazardous to our health in a long term use. The hazards of preservatives, flavours, Colours, and processing agents which are used in food are discussed here because though as we know these are essential for food storage but continous use of such kind of food materials act as SLOW POISON. It will increase the risk of different disease like obesity, cancer, poly cystic ovarian disease (P.C.O.D), cardio vascular disease etc. The substances on long term use which produces toxic effects are considered under *dushivisha*. *Acharya chakrapani* defines *dushivisha* as "*kalantara prakopi*" means it manifests the symptoms afterwards. *Dushivisha* has got its own significance in the present day because of increased food adulteration, changes in food processing, and increased use of chemicals which produce toxic effects on long run.

KEYWORDS: *Ahara, Dushivisha, Food additives, Preservatives, Side effect, Toxins, Visha.*

INTRODUCTION

Ahara is known as "*Vrittikaranam sreshtham*".^[1] *Ahara* is categorized as *Hitahara* and *Ahitahara*, *Pathya* and *Apathya* are also used in similar context.^[2] Food (*ahara*) significantly affect overall health, the metabolic and degenerative diseases are the result of regular use of processed food.^[3] Food have many nutrients, these nutrients produce energy in body. The food has limited shelf life, to increase the shelf life and to maintain the quality of food, additives are used.^[4] During the ancient time food storage was vital to society as the collection of the food was difficult because of lengthy rainy season, threat from animals, poor road connectivity and minimal transportation, so effective storage was very important and probably because of this, the concept of preservatives came into existence. Few of herbal ingredients like pepper, mustard, cumin, curcuma etc have also been used in food as preservatives.^[5]

Food Additives Classification: Food additives usually has six types.^[6]

1. Preservatives are used in food to slow down or prevent the growth of microorganisms. such as; sodium benzoate, sulphur dioxide, sugar etc.
2. Antioxidants are added in food to prevent oxidation

such as; Monosodium glutamate, Aspartame, salt, vinegar etc

3. Flavourings agents are used to improve the taste of food and to restore taste loss because of processing such as; sugar, salt, vinegar etc
4. Stabilizers helps to prevent an emulsion from separating out such as; lecithin, mono-and-diglycerides of fatty acids.
5. Thickeners used to thicken food such as; pectin, gum, gelatine etc.
6. Dyes/colouring agents are used to add or to restore the colour in food. Such as; Tartrazine, anthocyanin,^[7] etc.

Today more than 2500 different additives are intentionally added to foods to produce a desired effect. The use of these additives is a well-accepted practice but controversy,^[8] exists alot. The use of food additives had increased in past 30 years.^[9]

Table 1: Artificial food preservatives, its sources and side effects.^[10]

Sr.no	Preservatives	Uses	Side effects
1.	Benzoic Acid	Fruit products, Acidic foods, Margarine etc.	Hypertension, Asthma, Kidney Disease, Stroke etc.
2.	Sodium Nitrite	Processed meats, Sausage, Salami etc.	Decreases oxygen carrying capacity of red blood cells & it can cause respiratory problems etc.
3.	Sulfites	Fruits, Canned olives papers, Corn syrup wine etc.	Palpitations, Cancer, Allergy, Headache etc.
4.	BHT(butylated hydroxytoluene) BHA(butylated hydroxyanisole)	Preserves oil & fats in food like meat, Butter, Cereals etc.	Harmful to liver, kidneys & causes cancer etc.
5.	Monosodium Glutamate	Candy, Chewing gum, Drinks, Chips, Instant noodles, Fast food etc.	Causes Brain lesions, Seizures, Migraine, Depression etc.
6.	Bromates	White flour, Breads etc.	Diarrhea, Cancer etc.
7.	Monoglycerides and diglycerides	Cookies, Cakes, Breads, Roasted nuts, Peanut butter etc.	Birth defects, Cancer etc.
8.	Diacetyl	Taste enhancer etc.	Lungs disease etc.
9.	Sodium Benzoate	Fruit juices, Margarine, Acidic foods etc.	Sodium benzoate combined with vit c present in fruit juices produces benzene which is a potential carcinogen etc.
10.	Ammonium Sulfate	Breads etc.	Respiratory tract & gastrointestinal disturbance etc.
11.	Potassium Nitrite	Added to meats etc.	Headache, Dizziness, Coma, Cancer etc.
12.	Titanium Dioxide	Vanilla pudding, Chocolate bars, Whipped creams etc.	Cancer, Degenerative changes etc.
13.	Propyl Gallate	Soup bases, Processed meat, Vegetable oils etc.	Liver disease, kidney disease, Cancer, Hormones imbalance etc.
14.	Brominated oils	Bottled juice, Soft drinks etc.	Changes in heart tissues, enlargement of thyroid tissues, decrease liver metabolism etc.
15.	Maleic Hydrazide	Preserve potatoes to prevent from sprouting etc.	Cancer etc.
16.	Propylene glycol and carboxymethylcellulose	Ice cream, Chocolate milk etc.	Tumors etc.

The use of food preservative is regulated by specific laws namely European union- EU. In EU every food additive has a code that includes the letter E followed by three or

four digits.^[11] These are the E codes with their applications as shown in figure.^[12]

Five dangerous food additives that are banned in many countries, except India.

E-codes	Name of E-codes	Examples
E100-E199	Colour additives	Carminic acid, Riboflavin, Tartazine etc.
E200- E299	Preservatives	Sodium sorbate, Calcium benzoate etc.
E300-E399	Antioxidants, Acidity regulators	Ascorbic acid, Propyl gallate, Butylated etc
E400-E499	Thickeners, Stabilizers	Alginic acid, Agar, Oat gum etc.
E500-E599	Acidity regulators, Anti-caking agents	Sodium carbonate, Magnesium carbonatt etc.
E600-E699	Flavour enhancer	Glutamic acid, Zinc acetate etc.
E700-E799	Antibiotics	Tetracyclines, Penicillin etc
E900-E999	Miscellaneous	Bee wax, Rice bran wax etc
E1000-E1599	Additional chemicals	Cholic acid, Lysozyme etc

ARTIFICIAL DYES – Artificial dyes are added to foods to enhance their colour, including breakfast cereals, cakes, sports drinks and even candies. These are

made from chemicals derived from petroleum, food dyes can cause brain cancer and cell damage. Artificial dyes may also have an adverse effect on activity and attention

in children. Banned in Norway, Finland, Austria, UK, France these dyes are being used in India.

BHT/BHA - BHA (butylated hydroxyanisole) and BHT (butylated hydroxytoluene), banned in the UK, Japan and many other European countries. Although assumed to be safe in low doses, they may contribute to carcinogenicity. These preservatives are found in cereal, baked goods, packaging, cosmetics, snack foods, chewing gum, meats, butter, dehydrated potatoes, beer and many more.

ARSENIC – According to WHO, arsenic is a natural component of the earth's crust and is widely distributed throughout the environment in the air, water and land. It is highly toxic in its inorganic form. And rice has higher levels of inorganic arsenic than other foods. While the arsenic content in white basmati rice from California and India is much lower than other types, it has been linked to cancer, skin lesions, cardiovascular disease, neurotoxicity and diabetes.

OLESTRA - Olestra is a 'fake' fat found in foods like chips and French fries. It can have a harmful effect on your health by negating the body's ability to absorb essential vitamins. This fat substitute is banned in the UK and Canada.

PROPYL GALLATE -A common food additive that acts as a preservative can be found in edible fats, oils, baked goods, meat product, chewing gum and ready-to-make soup. Research has shown that this additive may be carcinogenic and also an endocrine disruptor. It is banned in many countries.

From the above it can be considered that today's most loved junk food is processed by different food additives and this is one of the type of *Dushi visha*.

Dushivisha- The term *dushivisha* is made up of two words; *dushi* means denatured or altered and *Visha* means poison.^[13] A part of *sthawara*, *jangama* or *krutrimvisha*, which cannot be removed from the body but instead becomes less potent after digestion or the counter action of antidote stays in the body for a long period and vitiating it slowly, is called

Dooshivisha^[14]

The Poison which is old and denatured by forest fire, wind and the sun or naturally deficient in its toxic properties attains the nature of *dushivisha*. *Dushivisha* acts like week poison with low potency it does not kill the person quickly but on prolonged use it gets stored in the body for many years with a covering of *kapha*.^[15] *Arundatta* the commentator of *Ashtanga Hridaya* said that *dushi Dooshivisha* is *avibhavyamana* which meant that it is not traceable due to *avarana* by *kapha dosha*. He also mentioned that *varshagananubandhi* was due to its ability to remain in the system for years together.^[16]

Clinical features of *Dooshivisha* – According to

Acharya Sushruta, intoxication, fainting and discoloration, intermittent fever, oligospermia, urticaria, vomiting, epileptic attacks, increased thirst, appearance of red patches all over the body indigestion, diarrhoea, insanity, distension of the abdomen, edema of the face and extremities, skin disorder.^[17]

Complications of *dushi visha* – Pyrexia, diarrhea, burning sensation, abdominal enlargement, oligospermia, cardiac disorder, tremors, urticaria, vomiting, edema, indigestion, hiccough, fainting, ascites etc.^[18]

DISCUSSION

Dushivisha produces multiple manifestation due to consuming processed foods, junk foods, consumption of foods with preservatives, coloring, flavoring agents for longer duration produces long term effects. Food additives are becoming a part of our daily use but it silently affects our health. It can cause disease like; hormonal imbalance, PCOD, cancer, behaviour problem, forgetfulness, hypertension, obesity, skin disease, infertility, sterility, diabetes, alopecia, alzheimer etc. So, it is important to create the awareness regarding the improper food habits and disease that occurs. Preventive measures should be taken to avoid ingestion of *Dushivisha*.

There is some relation between *dushivisha* and food additives complications.

Due to preservatives GIT disturbance occurs and in *dushivisha avipaka*, *arochak*, vomiting, diarrhea are explained.

Patches and rashes develop due to *rakt prakopa* in *dushivisha* whereas due to benzoates and sorbates skin rashes can be observed.

Dyspnoea is caused due to *dushivisha* whereas diacetyl may cause lung disease.

Insanity develops as complication of *dushivisha* whereas colour additives contributes to behavioural problems.

Junk Food addicted should be encouraged for periodic detoxification methods. Common people must be educated regarding incompatible habits, diet. *Panchakarma* therapy & counselling regarding *pathyapthya* should be adopted. *Agadas* can be prescribed. Ayurveda offers various methods to manage lifestyle disorders by following daily regimens, exercise, *yoga*, *pranayama*, herbal medicines, *panchakarma*, and *Rasayana* therapy. Substance such as preservatives, thickeners, stabilizer, coloring agents, emulsifier, acidity regulators, anti- caking and other chemicals agents, fast food and cold beverages etc, can be considered under latent poison or *dushi visha*.

CONCLUSION

Food additives are used to increase the shelf life of food

and to maintain the quality for longer period. These food additives can act like *dushivisha* if consumed regularly for a prolonged period. Food additives are becoming a part of our daily use but it silently affect our health. Before purchasing the canned food, its ingredients should be checked, one should purchase only organic foods, which are free from artificial additives. People should be encouraged to consume fresh food and to read the label of products. Nowadays, use of food additives are very widespread in human diet, but the various adverse effects associated with them remain a problem that need to be minimized by us. To lessen the risk of cumulative health problems due to food additives and preservatives, one should avoid the foods containing these additives & preservatives.

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