

Anna As A Hidden Source Of Dūṣiṣa In Modern Lifestyle

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ABSTRACT

Food (Anna) is regarded as one of the fundamental pillars of life in Ayurveda. While wholesome food sustains health and longevity, unwholesome, contaminated, or incompatible food can become a source of disease. The Ayurvedic concept of Dūṣiṣa describes a latent form of poison that remains concealed within the body and gradually vitiates the Dhātus, leading to chronic pathological conditions. Classical texts identify Anna as one of the important factors responsible for the manifestation of Dūṣiṣa. In the modern era, continuous exposure to pesticides, food additives, preservatives, heavy metals, microplastics, adulterants, and ultra-processed foods has become inevitable. These substances often enter the body in small quantities over prolonged periods, resulting in cumulative toxicity. This article explores the concept of Anna as a hidden source of Dūṣiṣa and highlights its relevance in understanding contemporary food-related health challenges through the lens of Ayurvedic toxicology.

Keywords: Dūṣiṣa, Anna, Food Toxicity, Chronic Poisoning, Food Contamination.

INTRODUCTION

Food (*Āhāra*) is a fundamental requirement for the survival and maintenance of all living beings. Recognizing its vital role, Ayurveda regards *Āhāra* as one of the three principal pillars of life (*Trayopastambha*), alongside *Nidrā* (sleep) and *Brahmacharya* (celibacy). These three pillars collectively support, nourish, and sustain the physical and mental well-being of an individual¹. “Anna” is a term often used synonymously with “*Āhāra*” to denote food. Acharya Charaka states, “*Annam Vṛttikaranam*”, emphasizing that food is the primary factor responsible for sustaining life and maintaining the body. Here, the term “*Vṛtti*” signifies nourishment, growth, and the proper functioning of the body. Thus, *Āhāra* serves as the essential source of nutrition that supports the development, maintenance, and vitality of an individual². A wholesome diet promotes the growth and maintenance of life, while an unwholesome diet becomes a source of various diseases³. Beyond nourishing the body, food significantly influences physical, mental, and emotional well-being. However, when consumed in an improper, incompatible, or contaminated form, it can become a causative factor for disease. Modern dietary practices have undergone remarkable changes due to industrialization,

globalization, and technological advancements in food production. Food products are increasingly exposed to chemical fertilizers, pesticides, preservatives, synthetic additives, packaging contaminants, and environmental pollutants. These toxic exposures often occur in minute quantities and may not produce immediate symptoms. Nevertheless, their cumulative effects can contribute to chronic diseases and metabolic disturbances.

Ayurveda offers a unique perspective through the concept of Dūṣiṣa, a latent poison that remains hidden in the body and gradually impairs tissue function. The inclusion of “Anna” among the etiological factors of Dūṣiṣa suggests the profound influence of dietary practices on chronic toxicity and disease development.

CONCEPT OF DŪṢIṢA

The term *Dūṣi Viṣa* comprises *Dūṣi* (vitiated, impure, or latent) and *Viṣa* (poison), indicating a weakened toxic substance that persists in the body for a prolonged period and gradually impairs health⁴. Dūṣiṣa refers to a poison of relatively low potency that persists in the body in a latent or concealed state. Owing to its diminished toxic properties (*Guna*), it does not produce immediate manifestations but acts gradually over time. Its prolonged persistence in the

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body may result in a delayed onset of toxic effects and cumulative toxicity⁵. The Avaraṇa effect of Kapha conceals and retains low-potency poisons within the body, allowing them to persist for a prolonged period without producing acute, severe, or fatal manifestation.⁶

दूषितं देशकालान्नदिवास्वप्नैरभीक्ष्णशः |

यस्माद्दूषयते धातून् तस्माद्दूषीविषं स्मृतम् ||

The poison which, due to repeated exposure to an unsuitable habitat, season, food, daytime sleep, and other improper lifestyle factors, remains in the body and gradually vitiates the *Dhātus* is *Dūṣīviṣa*. Thus, these factors contribute to the formation, persistence, and manifestation of *Dūṣīviṣa* in the body⁷.

Significance of *Anna* in *Dūṣīviṣa*:-

Anna is not merely a source of nutrition but can also become a medium for the accumulation of toxic influences. Ayurveda recognizes several dietary factors that may contribute to *Dūṣīviṣa* formation:

- Pesticide exposure ⁶
- Food Preservatives ⁹

- Ultra processed foods ¹⁰
- Heavy metal contamination ¹²
- Microplastics and Packaging Contaminants¹²
- Food Adulteration¹⁵

Repeated exposure to such dietary factors weakens *Agni*, promotes *Āma* formation, and initiates *Dhātu Duṣṭi*, thereby creating favorable conditions for *Dūṣīviṣa*.

Modern Sources of Food-Induced *Dūṣīviṣa* –

Pesticides

To prevent food losses caused by pests, more than 1,000 pesticide formulations are used across the world. Each pesticide exhibits unique physicochemical properties and produces specific toxicological effects in living organisms. exposure to large amounts of pesticides can lead to acute poisoning, while prolonged or excessive exposure may result in chronic health consequences⁵.

Major Human Health Disorders Associated with Exposure to Various Pesticides and Their Consequences⁶

Disorder/Disease	Pesticides Involved	Major Consequences
Alzheimer's Disease (AD)	Organochlorines, Organophosphates	Memory loss, dementia, cognitive decline, impaired thinking
Parkinson's Disease (PD)	Paraquat, Rotenone, Mancozeb	Tremors, muscle rigidity, impaired movement, neurodegeneration
Breast Cancer	DDT, DDE, Chlordane, Heptachlor, Chlorpyrifos, Organochlorines	Increased risk of breast tumor development and malignancy
Bladder Cancer	Imazaquin, Imazethapyr	Increased risk of bladder cancer
Colon Cancer	Various pesticides associated with heterocyclic aromatic amines	Increased risk of colorectal malignancy
Liver Cancer	Organochlorines, Certain fungicides and herbicides	Hepatic carcinogenesis and liver malignancy

Leukemia	Various agricultural pesticides, Permethrin	Abnormal white blood cell proliferation, childhood leukemia
Non-Hodgkin Lymphoma (NHL)	Glyphosate	Increased risk of lymphatic cancers
Male Infertility	Organophosphates, Pyrethroids	Reduced sperm count, poor sperm morphology, erectile dysfunction
Female Infertility	Herbicides and agricultural pesticides	Difficulty conceiving and reduced fertility
Birth Defects	Organochlorine Pesticides (OCPs)	Neural tube defects, limb defects, cleft palate, ocular abnormalities
Asthma	Organophosphates, Pyrethroids, Carbamates, Paraquat, Organochlorines	Wheezing, dyspnea, chronic respiratory problems
Respiratory Disorders	Agricultural pesticides, PAHs	Reduced lung function, airway inflammation, bronchial hyperresponsiveness
Lung Cancer	Long-term agricultural pesticide exposure	Increased risk of pulmonary malignancy
Non-Alcoholic Fatty Liver Disease (NAFLD)	Polychlorinated Biphenyls (PCBs), Various pesticides	Fat accumulation in liver, inflammation, liver dysfunction
Type 2 Diabetes Mellitus (T2DM)	DDT, DDE, Dieldrin, PCBs, Organophosphates, Organochlorines	Insulin resistance, impaired glucose metabolism, hyperglycaemia
Diabetic Nephropathy	DDT, Heptachlor Epoxide	Kidney damage associated with diabetes
Allergic Dermatitis	p-Phenylenediamine (p-PDA), Sensitizing pesticides	Rash, itching, blisters, skin irritation
Rhinitis	p-PDA, Phthalates	Sneezing, nasal congestion, runny nose
Allergic Asthma	Phthalates and sensitizing pesticides	Airway inflammation, wheezing, respiratory hypersensitivity

Food Preservatives

Artificial preservatives are synthetic chemicals added to foods to delay contamination and prolong shelf life. While they improve food preservation, some may

contribute to adverse health effects and are typically identified as additives on food labels^{7,8}.

Common Food Preservatives and Food-Contact Chemicals Associated with Adverse Health Effects

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Preservative/Chemical	Common Sources	Major Health Effects/Consequences
Sodium Nitrite & Sodium Nitrate	Bacon, sausages, hot dogs, ham, smoked fish, processed meats	Formation of nitrosamines, increased risk of colon, pancreatic, brain and nasopharyngeal cancers; diabetes; respiratory infections
Sulfites	Dried fruits, wine, shrimp, processed potato products	Asthma attacks, allergic reactions, skin irritation, diarrhea, abdominal pain, destruction of vitamin B ₁
Sodium Benzoate	Soft drinks, fruit juices, processed foods	Hives, asthma, allergic reactions; possible carcinogenic risk when combined with vitamin C
BHA (Butylated Hydroxyanisole)	Chips, cereals, cookies, vegetable oils, processed foods	Possible carcinogenic effects; tumor formation reported in animal studies
Propyl Gallate	Processed foods, fats, oils, meat products	Potential carcinogenic effects observed in animal studies
TBHQ (Tert-Butylhydroquinone)	Vegetable oils, processed foods, snacks	Increased incidence of tumors in animal studies
Artificial Food Colors	Candies, beverages, bakery products, children's foods	Hyperactivity and behavioral problems, particularly in children with ADHD
Trans Fats (Partially Hydrogenated Oils)	Processed snacks, baked goods, fast foods	Increased risk of cardiovascular disease and metabolic disorders
Emulsifiers	Ice cream, mayonnaise, processed foods	Altered gut microbiota, inflammatory bowel disease, intestinal inflammation
Bisphenol A (BPA)	Food can linings, plastic containers, receipts	Endocrine disruption, fertility problems, obesity, immune and nervous system disorders
Phthalates	Food packaging, plastics, personal care products	Hormonal imbalance, reproductive toxicity, obesity, cardiovascular disease, allergies, asthma
Perfluoroalkyl Chemicals (PFCs)	Non-stick cookware, grease-proof packaging, water-resistant products	Low birth weight, thyroid dysfunction, immune suppression, fertility problems
Perchlorate	Dry food packaging, contaminated water	Thyroid dysfunction, impaired brain development in children

Ultra-Processed Foods

WHO reports indicate that obesity and chronic diseases are increasing worldwide, partly due to the

higher consumption of ultra-processed foods. Diseases such as obesity, cardiovascular disease, and diabetes have become major public health problems. In 2016, about 1.3 billion adults globally were

affected by obesity, with most cases occurring in high-income countries¹⁰.

Health Disorders Associated with Ultra-Processed Foods¹⁰

Category of Disorder	Components Involved	Health Consequences
Obesity	High-fructose corn syrup (HFCS), trans fats, emulsifiers	Increased appetite, overeating, fat accumulation, weight gain, increased BMI, obesity
Diabetes	Added sugars, refined carbohydrates, unhealthy fats	Insulin resistance, impaired glucose metabolism, increased risk of Type 2 Diabetes Mellitus
Cardiovascular Diseases	Trans fats, excess salt, excess sugar	Hypertension, dyslipidemia, increased risk of heart disease
Cancer	Artificial additives, preservatives, nitrates, nitrites	Increased risk of colorectal cancer and other cancers
Neurological Disorders	Certain food additives, artificial sweeteners	Neurobehavioral and neurological disturbances
Endocrine Disorders	Artificial additives and preservatives	Hormonal imbalance and endocrine disruption
Allergic Reactions	Food additives, artificial colors, preservatives	Allergies, hypersensitivity reactions
Liver Disorders	Excess sugars, advanced glycation end products (AGEs), contaminants such as furan	Fatty liver disease, liver damage, hepatotoxicity
Gastrointestinal Disorders	Emulsifiers, additives	Gut microbiota imbalance, intestinal inflammation
Metabolic Disorders	High sugar, salt, and fat content	Metabolic syndrome, chronic inflammation

Heavy Metal Contamination

Exposure to heavy metals occurs through multiple pathways, including ingestion of contaminated food and water, inhalation of polluted air, and dermal absorption. These metals can disrupt a wide range of

physiological and biochemical processes, resulting in adverse health effects.¹¹

Toxicological Characteristics and Health Effects of Major Environmental Heavy Metals¹²

Heavy Metal	Sources of Exposure	Mechanism of Toxicity	Clinical Manifestations
Aluminum (Al)	Contaminated food and water, aluminum cookware and foil, industrial emissions, coal-fired power plants, metal industries, inhalation of aluminum dust and fumes	Accumulation in tissues, oxidative stress, neuroinflammation, disruption of iron metabolism, mitochondrial dysfunction, impairment of intestinal barrier and neurotransmission	Neurotoxicity, cognitive impairment, pulmonary fibrosis, COPD, asthma, anemia, hypertension, atherosclerosis, gastrointestinal inflammation, inflammatory bowel disease
Cadmium (Cd)	Cigarette smoke, mining and smelting industries, battery recycling, phosphate fertilizers, contaminated food and water, industrial emissions	Oxidative stress, mitochondrial dysfunction, lipid peroxidation, inhibition of antioxidant enzymes, DNA repair inhibition, apoptosis, inflammation	COPD, emphysema, pulmonary fibrosis, nephropathy, proteinuria, hypertension, atherosclerosis, osteoporosis, osteomalacia, lung cancer, kidney cancer, prostate cancer
Mercury (Hg)	Fish and shellfish (methylmercury), dental amalgams, industrial emissions, coal combustion, contaminated water, cosmetics, occupational exposure	Binding to sulfhydryl (-SH) groups, oxidative stress, mitochondrial damage, disruption of enzyme activity, neuronal degeneration	Neurotoxicity, tremors, memory loss, sensory impairment, nephrotoxicity, pulmonary toxicity, cardiovascular dysfunction, developmental abnormalities, Minamata disease
Arsenic (As)	Contaminated groundwater, industrial processes, pesticides, wood preservatives, cosmetics, seafood, rice, herbal medicines	Oxidative stress, inhibition of antioxidant enzymes, interference with cellular respiration, DNA damage, epigenetic alterations, endothelial dysfunction	Skin lesions, hyperpigmentation, hyperkeratosis, skin cancer, lung cancer, bladder cancer, peripheral neuropathy, cognitive dysfunction, hypertension, atherosclerosis, liver and kidney damage
Lead (Pb)	Lead-based paints, batteries, plumbing systems, mining, smelting, industrial emissions, contaminated dust, soil, food and water	Mimics calcium, disrupts neurotransmission, oxidative stress, inhibition of heme synthesis, mitochondrial dysfunction, enzyme inhibition	Cognitive impairment, developmental delay, encephalopathy, peripheral neuropathy, anemia, nephropathy, hypertension, reproductive toxicity, behavioral disorders
Chromium (Cr⁶⁺)	Chrome plating, welding fumes, leather tanning, stainless steel manufacturing,	Intracellular reduction generates reactive oxygen species (ROS), oxidative DNA damage, lipid	Dermatitis, skin ulcers, nasal septum perforation, asthma, bronchitis, pulmonary fibrosis, kidney and liver damage, lung cancer, reproductive toxicity

	contaminated water, industrial exposure	peroxidation, inflammation, genotoxicity	
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Microplastics and Packaging Contaminants

The primary raw materials used in packaging production are non-renewable resources, particularly petroleum and natural gas. The extraction, processing, and utilization of these resources contribute substantially to environmental degradation,

greenhouse gas emissions, and various adverse health impacts¹³.

Common Plastic Polymers, Their Monomers, Sources/Uses, and Potential Human Health Effects¹⁴.

Monomer Type	Polymer Type	Common Sources/Uses	System Affected in Humans
Ethylene	Polyethylene (PE)	Plastic bags, packaging films, bottles	Endocrine system and reproductive health
Propylene	Polypropylene (PP)	Food packaging, bottle caps, synthetic fibers	Allergic reactions and skin irritation
Terephthalic acid + Ethylene glycol	Polyethylene terephthalate (PET)	Beverage bottles, food containers, synthetic fibers	Reproductive health and hormone balance
Styrene	Polystyrene (PS)	Foam packaging, disposable utensils, insulation materials	Central nervous system and respiratory system
Vinyl chloride	Polyvinyl chloride (PVC)	Pipes, window frames, packaging materials	Endocrine disruption, reproductive health, hormone imbalance
Caprolactam (Nylon 6); Hexamethylenediamine + Adipic acid (Nylon 66)	Polyamide (PA)	Clothing fibers, fishing nets, automotive parts	Allergic reactions
Isocyanates + Polyols	Polyurethane (PU)	Foam materials, coatings, adhesives	Respiratory issues and allergic reactions
Methyl methacrylate	Acrylic (PMMA)	Acrylic sheets, paints, household products	Respiratory irritation
Terephthalic acid + Ethylene glycol	Polyethylene terephthalate glycol (PETG)	Beverage bottles, food containers, synthetic fibers	Respiratory irritation

Terephthalic acid + 1,4-Butanediol	Polybutylene terephthalate (PBT)	Electrical components, automotive parts, packaging materials	Developmental delays in children, neurological issues, cardiovascular problems in adults
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Food Adulteration

Food Safety and Standard Act of India (FSSAI) defined adulterants as, ‘any material which could be employed for making food impure, unsafe or sub standard or misbranded or containing extraneous matter’ Adulterants are commonly incorporated into everyday food products and pose significant health risks, including carcinogenic effects and other serious hazards (Jaiswal et al., 2016). Food adulteration arising during manufacturing and processing can negatively impact human health. These contaminants

are associated with a wide range of disorders such as cancer, cardiovascular diseases, renal and hepatic dysfunction, hormonal disturbances, reproductive issues, immune system suppression, and mental health problems. Various chemical adulterants, including formalin, calcium carbide, melamine, and histamine, are known to exert harmful effects on human health (Mridha, 2011).¹⁵

A list of commonly adulterated food products along with the adulterants used and their associated harmful effects on human health is presented below.¹⁵

Food Product	Adulterants	Impact on Health
Milk	Water, starch, urea, extraction of fat	Various health issues
Sugar	Chalk powder	Digestive system disorders
Tea	Artificial pigments/dyes, iron filings	Stomach infections
Coffee powder	Tamarind and date seed powder, sawdust	Liver disorders, cancer
Salt	White powder, stone, rawa	Diarrhea
Chilli powder	Artificial colors, brick powder, Sudan dye	Stomach disorders
Turmeric	Lead chromate, sawdust, metanil yellow	Blood and lung cancer
Mustard seed	Seeds of prickly poppy (Argemone)	Carcinogenic effects
Black pepper	Dried papaya seeds	Epidemic dropsy, glaucoma
Pulses	Kesari dal, metanil yellow, clay, stone	Cardiac arrest, harmful effects
Butter	Margarine, starch	Lathyrism, carcinogenesis, stomach disorders
Honey	Fructose syrup, cane sugar	Food poisoning
Sweets/Juices	Coal tar dye, metanil yellow	Stomach disorders
Rice, Wheat	Mud, sand, soapstone, ergot	Cancer, toxin release
Green chillies/Green peas	Malachite green	Cancer, genetic mutations, reproductive harm

Vegetable oil	Argemone oil, mineral oil	Cancer
Ghee	Vanaspati, ghee essence, starch, mashed/sweet potato	Heart disease, skin infections, cancer
Carbonic drinks	Aluminium compounds	Cancer, acute renal failure
Ice creams	Detergent powders	Asthma, lung disorders
Seafood	Mercury, arsenic	Skin, lung, brain disorder

DISCUSSION

Dūṣiṣa is characterized by the persistence and gradual action of poison in the body due to repeated exposure to improper *Deśa*, *Kāla*, *Anna*, and lifestyle factors. Among these, *Anna* is particularly important because food is consumed regularly and may act as a route of repeated exposure to toxic substances. Modern dietary contaminants such as pesticides, preservatives, heavy metals, microplastics, packaging contaminants, and adulterants may contribute to chronic toxic exposure. From an Ayurvedic perspective, repeated intake of such unsuitable *Anna* may impair *Agni*, promote *Āma* formation, and subsequently cause *Dhātu Duṣṭi*, providing a conceptual basis for the development and manifestation of Dūṣiṣa.

CONCLUSION

Dūṣiṣa provides an important Ayurvedic framework for understanding the effects of repeated, low-level toxic exposure. Contaminated and unsuitable food may play a significant role in this process through impairment of *Agni*, *Āma* formation, and *Dhātu Duṣṭi*. Therefore, ensuring food safety, avoiding adulterated or contaminated foods, and adopting wholesome dietary practices may help prevent the accumulation and manifestation of Dūṣiṣa. Further scientific studies are required to establish direct correlations between classical Dūṣiṣa and modern dietary toxicants

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