

6. Ultra-Processed Foods – Science & Technology

A series in Lancet warns that ultra-processed foods (UPFs) are fuelling a global rise in obesity, diabetes, and chronic diseases, a trend rapidly intensifying in India.

Understanding Ultra-Processed Foods (UPFs)

Definition and Classification

UPFs fall under the NOVA Food Classification System, which categorizes foods based on the extent and purpose of processing. UPFs (NOVA Category 4) are industrial formulations made through multiple processing steps, involving chemical and physical transformations not achievable in home kitchens. They contain little or no whole foods and rely heavily on additives to create sensory appeal, long shelf life, and convenience.

Key Ingredients in UPFs

Emulsifiers – ensure texture and prevent separation (e.g., E466, E471). Stabilizers and thickeners – maintain consistency (e.g., xanthan gum, guar gum). Flavor enhancers and artificial flavors – increase palatability (e.g., MSG). High-fructose corn syrup, artificial sweeteners – used for intense sweetness. Colorants and preservatives – increase visual appeal and extend shelf life.

General Characteristics

Highly palatable, engineered to be “hyper-rewarding” to promote overconsumption. Ready-to-eat, ready-to-heat, or ready-to-drink, fitting modern convenience needs. High in calories, saturated fats, sugar, and sodium; low in dietary fiber, protein, and micronutrients. Long shelf life and mass production make them cheap and easily accessible.

Common Examples

Packaged snacks – chips, namkeens, nachos.

Sugary beverages – soft drinks, energy drinks, sweetened juices.

Confectionery – chocolates, candies, packaged cakes, pastries.

Fast foods – nuggets, fries, burgers, hotdogs.

Ready meals – instant noodles, frozen pizzas, packaged soups.

Children’s foods – sweetened cereals, flavored yoghurts, packaged milk drinks.

Health Impacts of Ultra-Processed Foods

Metabolic and Chronic Diseases – High consumption is linked to obesity, metabolic syndrome, type-2 diabetes due to excessive sugar and fat intake. Causes insulin resistance and chronic inflammation, increasing risk of hypertension and cardiovascular disease. Raises LDL cholesterol and contributes to non-alcoholic fatty liver disease (NAFLD).

Impact on Brain and Behaviour – UPFs trigger dopamine-driven reward pathways, creating patterns similar to addictive behavior. Artificial sweeteners and flavor enhancers influence cravings and disrupt appetite regulation. Nutrient-poor diets (low omega-3, vitamins) negatively affect cognitive development in children.

Gut Microbiome Disruption – Emulsifiers and preservatives alter gut bacterial composition. Reduced microbial diversity leads to intestinal inflammation and increased risk of inflammatory bowel diseases (IBD). Impacts digestion, mental health (via gut-brain axis), and immune response.

Cancer Risk – High intake associated with increased incidence of colorectal, breast, and pancreatic cancers. Carcinogenic contaminants can form during ultra-processing, including acrylamide and advanced glycation end-products (AGEs).

Impact on Children – Linked to early-onset obesity, childhood diabetes, dental caries, and learning difficulties. Marketing targeted at children (cartoons, bright packaging) worsens consumption patterns.

Rising UPF Consumption in India

Explosive Growth in Sales – Retail sales expanded from \$0.9 billion in 2006 to \$38 billion in 2019, representing a 40-fold increase. UPFs outpaced the growth of fresh and minimally processed foods.

Parallel Increase in Obesity and NCDs – Obesity in India nearly doubled during the same period. Strong correlation with consumption of sugary beverages, fast foods, and packaged snacks.

India as a High-Growth Market – UPF sales grew by 150% in 15 years, making India one of the fastest-growing markets globally. Key drivers include rising incomes, aggressive marketing, food delivery platforms, and lifestyle changes.

Urban and Rural Penetration – Once limited to urban areas, UPFs are now pervasive in rural markets through kirana stores and mobile retail vans. Deep penetration of soft drinks, biscuits, and instant noodles in rural India.

Challenges in Eliminating or Regulating UPFs

Aggressive Marketing and Behavioural Manipulation – Companies use celebrity endorsements, influencer promotions, sports sponsorships, cartoon characters, BOGO (“Buy One Get One”) discounts, and digital advertising to build brand loyalty. Children and teenagers are most vulnerable to targeted campaigns. Marketing promotes UPFs as aspirational, convenient, and modern.

Regulatory Gaps and Weak Enforcement – India lacks mandatory front-of-pack warning labels (FOPL). Food Safety and Standards Authority of India (FSSAI) norms remain voluntary for many categories. Advertising Standards Council of India (ASCI) has limited enforcement power, especially for digital ads. No statutory restrictions on marketing UPFs to children.

Changing Lifestyles and Convenience Dependence – Urbanisation, nuclear families, and dual-income households increase reliance on ready-to-eat foods. Growth of food delivery apps and quick-commerce platforms boosts sales of high-calorie fast foods. Sedentary lifestyles worsen metabolic consequences.

Economic and Industry Influence – Large food corporations lobby against strong regulation. UPFs are cheap to produce but highly profitable, incentivizing aggressive expansion.

Policy Recommendations to Address the UPF Challenge

Institutional Restrictions – Ban or restrict UPFs in schools, anganwadis, colleges, hospitals, and government offices. Promote traditional Indian diets, millets, fresh fruits, vegetables, and minimally processed foods. Ensure healthy procurement policies in public institutions.

Front-of-Pack Warning Labels (FOPL) – Mandatory warning signs for high sugar, sodium, trans fats, and saturated fats. Labels should be simple (black-and-white), prominently placed, following global best practices from Chile, Mexico, and Brazil. Prevent misleading labels such as “low fat”, “high protein”, or “natural flavor” on UPFs.

Fiscal Measures (Taxation and Subsidies) – Higher GST slabs (28% or more) on UPFs, sugary drinks, energy drinks, and HFSS foods. Use tax revenue to subsidize healthier alternatives like millets, eggs, fruits, vegetables, and school meals. Encourage small farmers and MSMEs to supply minimally processed foods.

Stronger Regulation and Standards – Move from voluntary to mandatory restrictions on additives, marketing to children, and sugar content. Strengthen competition regulation to prevent monopolistic practices by multinational food giants. Expand monitoring of food labeling, advertising content, and packaging claims.

Public Awareness and Education – Nutrition education campaigns emphasizing whole foods and traditional diets. Integration of food literacy into school curriculum. Encourage community-based programs promoting healthy eating habits.

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