

Inclusion of ultra-processed foods within the regulatory framework

*A concept note for the Scientific Committee (SC) of the
FSSAI*

Submitted by:

Breastfeeding Promotion Network of India (BPNI)

Nutrition Advocacy in Public Interest –India (NAPi)



Contents

Executive Summary	3
Introduction	5
Public Health Crisis India Faces	5
What are UPFs and how to identify these	6
Negative Impact on Human Health: The Evidence	6
Risks of Ultra –Processing	7
Potential Mechanisms that explain the link between consumption of UPFs and chronic disease	7
Aggressive Marketing of UPFs	8
Analysis of the existing policy response	9
Policy Response Required to Halt the Consumption of UPFs in India	10

Executive Summary

India is facing a rapidly escalating public health crisis of non-communicable diseases (NCDs) with millions suffering from diabetes, cancer, and cardiovascular disease currently. In the Comprehensive National Nutrition Survey (2016-2018), more than half of the children and adolescents (5-19) years old had biomarkers indicating a substantial NCDs risk burden. Consumption of ultra-processed foods (UPFs), which are intrinsically unhealthy, is rising, and is a central cause of the rapidly escalating burden of obesity and associated NCDs.

Robust evidence indicates that the increasing consumption of Ultra-Processed Foods (UPFs) is associated with over-eating, obesity, type 2 diabetes, cancers, cardiovascular diseases, and all-cause mortality. Apart from the detrimental nutrients of concern, namely, high fats, sugar, high sugar and high salt (HFSS foods), robust evidence indicates that food processing itself is detrimental to human health.

The UPFs are not real but industrially processed formulations of food substances modified by chemical processes and assembled into ready to consume foods, which makes them intrinsically unhealthy. Nova classification of foods defines 4 groups of foods: unprocessed/ minimally processed; culinary foods; processed foods; and ultra or highly processed foods. The UPFs are made hyper-palatable, mostly high in sugar, salt, and trans-fats. Flavours, colours, stabilisers, humectants, dyes, emulsifiers and other cosmetic additives that we don't use in the domestic kitchen are part of UPFs. The mechanisms by which the UPFs become unhealthy include: intake of unhealthy nutrients of concern (HFSS); cosmetic additives and phthalates in the packaging could negatively alter the microbiome and lead to metabolic dysfunction; hyper-palatability drives overconsumption; and reduced fiber in the diet.

Increased awareness of the unhealthy nature of UPFs or HFSS foods led the food industry to adopt reformulation and reduce the amount of nutrients of concern. This reformulation strategy has been challenged, as it does not change the nature of the food product, which remains a UPF. A specific example is changing sugar to artificial sweeteners, which can also be harmful. At the same time, reformulation allows food industry to aggressively market its products using claims of “low or free from”, which contributes to over-consumption of UPFs.

The power of food marketing using celebrity endorsement, offering incentives/ tie-in gifts and especially targeting children and adolescents is a principal reason for increasing consumption of UPFs and thus requires stringent restrictions. The World Health Assembly in 2010 adopted a resolution recommending restrictions in marketing of unhealthy foods and beverages to children. Despite this global public health effort, the recent WHO systematic review on this subject “confirms that marketing of foods that contribute to unhealthy diets remains pervasive and persuasive and provides evidence that strengthens the rationale for action to restrict food marketing to which children are exposed”. In 2016, the Pan American Health Organisation (PAHO), WHO's regional office for Latin America; noting high incidence of obesity and increasing UPF consumption, proposed a Nutrient Profile Model to be used for labeling and restricting marketing in order to discourage the consumption of UPFs. Many countries including Brazil, Chile, Canada, France, Israel, Mexico, Peru, UK and Uruguay have initiated actions in this direction.

It is critical that India responds rapidly too, especially because consumption of UPFs even though currently low, is increasing exponentially. Laws and regulations play a critical role in addressing such pressing public health issues. Putting highest GST slab on sugary drinks is a welcome policy. However, the existing regulations of FSSAI do not define UPFs or restrict their marketing on TV/Social media/other strategies, which increase the power of marketing. The following policy actions are therefore recommended:

1. FSSAI could adopt 'Nova Classification' of Foods, within existing Regulations concerning HFSS or in a new one.
2. FSSAI could develop new regulations for restriction of marketing of UPFs, especially targeted at children and adolescents, and simultaneously address the powerful marketing strategies including celebrity endorsement and incentives on sales. The thresholds, which are under development for HFSS, may also be applied to marketing restrictions.
3. FSSAI could include UPF mark in the front-of-pack warning label under consideration as suggested by the researchers in recent BMJ Editorial.
4. FSSAI could advocate for highest GST slab for UPFs.

Inclusion of ultra-processed foods within the regulatory framework

A concept note for the Scientific Committee (SC) of the FSSAI

1. Introduction

Based on our communication regarding ultra-processed foods (UPFs), definition, associated risks to human health, the CEO FSSAI, has requested us to develop a concept note for the consideration of the Scientific Committee of FSSAI to include UPFs as a part of the regulatory framework of FSSAI. The concept note includes the public health crisis India faces due to consumption of UPFs, definition of UPFs and how to identify them, evidence that supports the impact it has on human health, mechanism that explains the relation between consumption and disease burden, role of aggressive marketing in increasing consumption, analysis of existing policy frameworks and policy recommendation for curbing the marketing and consumption of UPFs.

2. Public Health Crisis India Faces

According to the World Health Organisationⁱ the Non Communicable diseases (NCDs) are increasing mostly due to four major risk factors i.e., tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets.

As per the National Health Portal of India by Government of India, (NCDs) are one of the major challenges for public health in the 21st century, not only in terms of human suffering they cause but also the harm they inflict on the socioeconomic development of the country.ⁱⁱ As per this information, NCDs kill approximately 41 million people (71% of global deaths) worldwide each year, including 14 million people who die too young between the ages of 30 and 70. It is projected that

annual number of deaths from NCDs will increase to 55 million by 2030. In India, it is estimated that nearly 5.8 million people die from NCDs every year. The Ministry of Health and Family Welfare (MOHFW), Government of India (GOI), report 'India: Health of the Nation's States'ⁱⁱⁱ shows that there is increase in the contribution of NCDs from 30% of the total disease burden- 'disability-adjusted life years' (DALYs) in 1990 to 55% in 2016 and also an increase in proportion of deaths due to NCDs (among all deaths) from 37% in 1990 to 61% in 2016. This amounts to a rapid epidemiological transition with a shift in disease burden to NCDs.

It is also alarming that India is sitting on a ticking time bomb of non-communicable diseases (NCDs) as reported by Comprehensive National Nutrition Survey 2016^{iv}. The survey revealed that 56% of children between five to 19 years of age, including those who were thin or short too, had cardio-metabolic risk factors (meaning their blood tests show risk factors).

At the same time increasing consumption of UPFs is noted in India. According to Euromonitor data, the sale of UPFs in India has increased from 2 kg per capita in 2005 to 6 kg in 2019, and is expected to grow to 8 kg by 2024. Similarly, the sale of beverages has gone up from less than 2 litres in 2005 to about 8 litres in 2019, and is expected to grow to 10 litres by 2024^v.

3. What are UPFs and how to identify these

The most acceptable definition for the UPFs is:

“Ultra-processed foods are not ‘real food’. As stated, they are formulations of food substances often modified by chemical processes and then assembled into ready-to consume hyper-palatable food and drink products using flavours, colours, emulsifiers and a myriad of other cosmetic additives. Most are made and promoted by transnational and other giant corporations. Their ultra-processing makes them highly profitable, intensely appealing and intrinsically unhealthy.”^{vi}

Basis of defining UPFs began during research in Brazil, when the scientists found that in spite of the overall reduction in sugar consumption in the country, obesity rates were rising. Further work led to the development of Nova classification of foods into 4 food groups; i) unprocessed or minimally processed foods, ii) the culinary ingredient foods, iii) processed foods and iv) the UPFs or highly processed foods (UPFs). **(See Annex-1)**

While we do consume our foods with some form of processing e.g. cooking, the UPFs are distinguished by the industrial *nature* and *purpose* of their processing. These highly processed foods use substances such as protein isolates, food colouring or emulsifiers to imitate sensory properties of fresh foods. It is only during the last decade; we have seen some shift away from a nutrient-centric approach to assess the quality and harms of foods based on food processing^{vii}. The cosmetic additives and flavours found in many UPFs make foods hyper palatable, and

more attractive, that could lead to over consumption.

4. Negative Impact on Human Health: The Evidence

There is robust evidence that links UPFs to serious health consequences. These UPFs are products that are exposing billions of people to a higher risk of type 2 diabetes, heart disease, stroke, depression and death.^{viii, ix} The increase in the volume of industrially processed products in the global food supply has coincided with an increasing prevalence of obesity and non-communicable diseases in many countries. As per a systematic review with meta-analysis conducted in 2021, worse cardiometabolic risk profile (reported mainly by an increased risk of overweight/obesity, elevated waist circumference, reduced HDL-cholesterol levels and increased risk of the metabolic syndrome), greater risk of all-cause mortality, CVD, cerebrovascular disease and depression have a possible association with high UPF consumption.^x A narrative review conducted in 2020 with 43 studies reviewed, 37 found dietary UPF exposure associated with at least one adverse health outcome. Among adults, these included overweight, obesity and cardio-metabolic risks; cancer, type-2 diabetes and cardiovascular diseases; irritable bowel syndrome, depression and frailty conditions; and all-cause mortality. Among children and adolescents, these included cardio-metabolic risks and asthma.

According to a study conducted with 104 980 participants aged at least 18 years (median age 42.8 years) from the French NutriNet-Santé cohort (2009-17) to assess the prospective associations between consumption of UPFs and risk of cancer, a 10% increase in the proportion of UPFs in the

diet was associated with a significant increase of greater than 10% in risks of overall and breast cancer^{xi}. A study conducted in Los-Angeles with 406 incident breast cancer cases with a population based control aged 20–45 years using a lifestyle and food frequency questionnaires (FFQ), anthropometric measurements, biological samples and tumour receptor status revealed positive associations between the consumption of UPF and Breast Cancer risk in young women in LA.^{xii}

No study has reported an association between UPF and beneficial health outcomes.^{xiii}

Plethora of scientific evidence that impact health negatively^{xiv, xv, xvi} only calls for urgent policy response.

A recent first time study in adolescents^{xvii} in the US examined association on consumption of UPFs and cardiovascular disease risk factors. It concluded U.S. adolescents consume about two thirds of daily calorie from UPF. There was a graded inverse association between %kcal from UPF and CVH score based on American Heart Association's seven cardiovascular health (CVH) metrics.

5. Risks of Ultra -Processing

Industrial Ultra processing comes with its own risks to health independent of its nutrient content. In a recent editorial in the BMJ^{xviii}, the authors are of the opinion that special attention be paid to the ultra-processed foods in labelling and making it known to people. The evidence clearly indicates that ultra processing of food itself is harmful. A recent review on 37 cohort studies^{xix} concluded that the majority of the associations between UPFs, obesity and health-related outcomes remain significant and unchanged in magnitude after adjustment for diet quality or

pattern. The findings suggest that the adverse consequences of UPFs are independent of dietary quality or pattern, questioning the utility of reformulation to mitigate against the obesity pandemic and wider negative health outcomes of UPFs.

6. Potential Mechanisms that explain the link between consumption of UPFs and chronic disease

When we put the real foods through any type of processing, it changes fundamental properties of food. When we increase consumption of UPFs, intake of saturated fat, free sugars, and sodium rises and intake of fiber, protein, and potassium falls. This makes UPFs unhealthy. Ultra-processing removes the protective fiber layer of grains making the food a health risk. UPFs are high in sodium or sugar as compared to minimally processed foods, which is a contributor cardio-metabolic disease and deaths. There are several proposed mechanisms how UPFs cause health impact^{xx}. Replacement of normal diet replacing nutrient-rich foods, increased palatability, diets rich in UPF are less satiating and more likely to lead to overconsumption. In a randomized controlled trial where participants were fed either a UPF or non-UPF diet for 2 weeks, those on the UPF diet consumed more calories and gained weight of about 900 Gms in 2 weeks as compared to the non-UPF group. Diet was similar in energy and macronutrient composition^{xxi}. This explains that a weight-driven causal mechanism operates.

There are concerns on the presence of endocrine-disrupting chemicals from packaging materials (i.e., phthalates and bisphenol), which may negatively alter the microbiome and cause increased risk of

metabolic dysfunction and cancer.^{xxii}The Report of the technical consultation on measuring healthy diets: concepts, methods and metrics. Virtual meeting, 18–20 May 2021. Geneva: World Health Organization recognized that bisphenol A, and increased presence of potentially harmful additives (e.g., emulsifiers), is harmful to human health^{xxiii}.

UPFs contain additives that negatively affect our health. For example, Carrageenan and carboxy methyl cellulose (CMC), thickening agents commonly used in meat and dairy product formulations, have been shown to be associated with intestinal inflammation. Non-caloric artificial sweeteners, often used in the place of sugar in food products and advertised as being low in sugar or sugar-free, may also contribute to metabolic dysfunction.

Emulsifiers, a ubiquitous class of stabilizers commonly added to UPFs, have been shown to induce metabolic syndrome. Compounds such as Acrylamide, acrolein, polycyclic aromatic hydrocarbons (PAH), and furan are commonly used in the preparation of UPFs. Acrylamide is present in chips and breakfast cereals. It may contribute to cancer formation. Exposure to polycyclic aromatic hydrocarbons (PAH) is associated with dyslipidemia, hypertension, and type-2 diabetes prevalence. Dietary polyphenols are also greatly reduced during ultra-processing, and so the protective effects of the gut microbiome against inflammation go down.

7. Aggressive Marketing of UPFs

In 2010 the WHO recommended to restrict the marketing of foods and non-alcoholic beverages to children. But food marketing remains prevalent globally and across many platforms (e.g. TV, digital media, outdoor, in-

store). Evidence confirms that food marketing continues to be dominated by the promotion of foods that contribute to unhealthy diets.^{xxiv}This report, a narrative review commissioned by WHO, found that strategies used by the food industry have proven very successful at increasing consumption.

Consumers in India are subjected to aggressive marketing that alters behaviour to consume UPFs. While advertising none of the UPFs manufacturers disclose its high sugar, salt or fat, what to expect of being told that it is UPF product. Minutely mentioned nutrient content is given to a consumer⁵. Researchers have found that foods are typically presented as an issue of ‘choice’. However, this disregards the fact how unhealthy foods-UPFs are marketed in an environment that promotes obesity. Marketing tactics interfere with people’s ability to make good/healthy choices. Digital medium is largely responsible for this and people and policy makers are unaware.^{xxv}Here are few examples some of the UPFs products marketed aggressively in India through TV or print media. All of them do not disclose the warning on high sugar /salt content of the product.

1. Kellogg's Breakfast Cereal is UPF by definition and promoted with claiming “Power of 5 nutrients and saving parents’s time to cook.”It also features children and adolescents
<https://www.youtube.com/watch?v=O4YjbAXVzo0><https://www.youtube.com/watch?v=qTim9yKFP6k>
2. PROVEE Choco Malt 2 is another one advertised in Times of India with a claim saying “Made with Jaggery, support active mind, immunity and growth” “Because mom know the difference”.

3. Hershey's Kisses milk Chocolate advertised widely on TV, it does not even disclose the sugar content which is quite high.
4. Parle Monaco Cheeslings Classic Biscuit, is highly reviewed on YouTube by consumers and bloggers.
5. 'Nutrela Kids Super Food' advertises health claims such a "Super Food" made with guidelines from ICMR and also claims active muscle mass, growth, memory and brain development and bone-teeth strength". It is widely advertised in TV.
6. Zero Sugar Coke claims to have no sugar but instead has Sweeteners (951,950),and is widely marketed through print media (Hoardings) in India.

(Annex- 2 provides ingredients in these products to identify as UPFs. And few more such examples.)

8. Analysis of the existing policy response

India has made progress on policy response to deal with growing disease burden in the form of regulations such as School Children Regulation, 2020, Food Safety and Standards (labelling and display) Regulations, 2020, Advertising and Claims) Regulations, 2018. The Food Safety Act 2006 provides that there will be no misleading advertisement but does not define it. The Consumer Protection Act, 2019 addresses definition of misleading advertisement and prescribes fines for misleading advertising of unhealthy food products. These regulations provide for 'claims' and 'prohibitions', use of 'low' or 'free' from sugar etc., description of some additives that may perform technological

functions, and disease reduction claims. Further marketing restrictions around schools is included. These also provide logos for 'fortified foods' or 'organic foods', labelling of pre-packaged foods, and to 'Name the food' based on the nature of food contained in it.

To date, much of the policy and public messaging about 'unhealthy food' or the regulations have focused on specific nutrients—saturated fats, sodium and sugar (HFSS). These regulations do provide opportunities for inclusion of UPFs in the definitions and regulations or construct a new regulation on similar lines for UPFs. In a recent analysis on the representation of UPFs in the national processes/guidelines, the authors concluded "*Overall, nutrient-based messages were more common than messages about processing levels. The majority of discouraged foods were ultra-processed foods, however some minimally processed foods were discouraged, which points to tensions and contradictions between nutrient- and processing-based dietary advice. As dietary guidelines begin to include advice about food processing, it is important to consider both consumer understanding of the terms used and their capacity to act on the advice*".^{xxvi}

The Government of India has recognised that sugary drinks are harmful to health and put them in highest slab GST based on this example all UPFs could be included in this range of sin tax commodities. As the regulations are yet to recognise UPFs as a food product, it seems to be an opportunity to provide for a definition and restrictions on the marketing of UPFs products.

9. Policy Response Required to Halt the Consumption of UPFs in India

The report of the technical consultation on measuring healthy diets, organized by WHO recognises that industrial-level food processing, and the associations between UPFs products and adverse health outcomes. It also noted that ‘Nova classification’ of food is a transformational way to think about diet. “It is simple, easy to communicate to policymakers/consumers, and could support advocacy for interventions to curb obesity/NCDs.” UPFs consumption is known to be a major contributor to failing food systems.^{xxvii} The Nova Food Classification of foods shifts our thinking from a predominantly nutrient centric understanding to more holistic one that recognises presence of other chemical additives and ingredients.

The American Heart Association has recommended reducing the consumption of UPFs in diet.^{xxviii} Dietary Guidelines in Brazil^{xxix} by MOH have recommended cutting down consumption of UPFs, as also the Government of Canada.^{xxx} The Pan American Health Organisation recognizes UPFs as important for reducing health risk, as part of their nutrient-profiling model. Some other national dietary guidelines that promote limiting UPF intake are, Uruguay and Israel. France is also planning to reduce UPF consumption by 20% from 2018 to 2021.

The High Council on Public Health of France includes a 20% reduction in ultra-processed food consumption as one of the goals of its public health nutrition policy for 2018-2022.^{xxxi} In 2021 The EASL-Lancet Liver Commission has made similar recommendations for preventing liver diseases.^{xxxii}

Pervasive marketing by food companies using claims and offering choices that are not real choices, makes it an imperative to control marketing of UPFs. Availability of definition and how to identify UPFs is an opportunity for Government of India to inform consumers about UPFs. Since the marketing techniques used to promote UPFs are aggressive, policy response has to match it. Laws and regulations play a critical role in addressing pressing public health issues like this one. When the public does not fully understand about food products, additional policy response on front of pack labels has been suggested by the scientists. that makes it clear to people they are buying or eating unhealthy UPFs product. BPNI and NAPI have also developed public communication in 14 languages regarding UPFs and real food alternatives to common UPFs using common foods consumed in India.^{xxxiii}

As UPFs consumption is increasing in India, it is best to be regulated at policy level as a part of food safety measure not just at the level of individual consumption. Considering the robust evidence that UPFs negatively impact human health, it strengthens the case for immediate regulation.

Is Re-formulation of UPFs is the answer?

Some scientists have recommended reformulation of UPFs rather than elimination, which may not be feasible^{xxxiv}. Others have argued for a holistic policy objective, which is based on the understanding of the biological mechanisms that are associated with UPF consumption and health harms^{xxxv}. Reformulation is unlikely to be a good policy response to the harms associated with high UPF consumption. Changing the composition of

UPFs, i.e. reformulating them e.g. by reducing content of sugar, fat or salt, is a common approach to make products ‘healthier’, and use this as a claim for marketing. Using labels like ‘low-fat’ ‘low sugar’ or No added sugar or ‘use of jaggery’ are some of the examples. Another example is changing sugar to artificial sweeteners, which are shown to be harmful too. However, such products remain UPFs in character. Such claims do not automatically make food products healthier. Further, re-formulation stimulates addition of other substances / additives to allow hyper-palatability and keeping the food products cheaper. This leads to higher level of consumption. Thus, it gives UPFs a perception of being healthy, and promotes their consumption, which is likely to increase the burden of diseases. Therefore, this action is likely to be counter-productive from a public health perspective.

Therefore, our policy objectives in India should be to promote diverse, culturally-appropriate, safe and sustainable diets rich in unprocessed or minimally processed foods, and meals and dishes made using combinations of these foods with processed culinary ingredients and some processed foods.

Few policy actions are suggested below for a long-term public health goal. Other than contribution to prevention of chronic disease, these actions will also prevent and reduce environmental degradation, including plastic waste entering marine ecosystems.^{xxxvi}

1. FSSAI could adopt ‘Nova Classification’ of Foods, within existing Regulations i.e Food Safety and Standards (labelling and display) Regulations, 2020, Advertising and Claims) Regulations, 2018 concerning HFSS or in a new one.
2. FSSAI could develop new regulations for restriction of marketing of UPFs, especially targeted at children and adolescents, and simultaneously address the powerful marketing strategies including celebrity endorsement and incentives on sales. The thresholds, which are under development for HFSS, may also be applied to marketing restrictions.
3. FSSAI could include UPF mark in the front-of-pack warning label under consideration as suggested by the researchers in recent BMJ Editorial.
4. FSSAI could advocate for highest GST slab for UPFs.

ⁱhttps://www.who.int/health-topics/noncommunicable-diseases#tab=tab_1

ⁱⁱ<https://www.nhp.gov.in/healthyliving/ncd2019>

ⁱⁱⁱhttps://www.healthdata.org/sites/default/files/files/2017_India_State-Level_Disease_Burden_Initiative_-_Full_Report%5B1%5D.pdf

^{iv}<https://nhm.gov.in/WriteReadData/1892s/1405796031571201348.pdf>

^vPassport Packaged Food in India Euromonitor International January 2020

^{vi}Carlos A Monteiro et al (2018), Ultra-processed foods: what they are and how to identify them, Public Health Nutrition: 22(5), 936–941, doi:10.1017/S1368980018003762 <https://pubmed.ncbi.nlm.nih.gov/30744710/>

^{vii}Monteiro CA, Cannon G, Lawrence M, Costa Louzada M, Pereira Machado P. Ultra-processed foods, diet quality, and health using the NOVA classification system. 2019; <http://www.fao.org/3/ca5644en/ca5644en.pdf>

^{viii}Pagliai, G., Dinu, M., Madarena, M. P., Bonaccio, M., Iacoviello, L., & Sofi, F. (2021). Consumption of ultra-processed foods and health status: a systematic review and meta-analysis. *British Journal of Nutrition*, 125(3), 308-318. <https://pubmed.ncbi.nlm.nih.gov/32792031/>

^{ix}Ultra-processed foods: A global threat to public health, UNC GLOBAL FOOD RESEARCH PROGRAM • MAY 2021 [UPFs Fact Sheet May2021 \(globalfoodresearchprogram.org\)](https://www.globalfoodresearchprogram.org/UPFs_Fact_Sheet_May2021)

^xLawrence, MA & Baker, PI (2019) Ultra-processed food and adverse health outcomes. *BMJ* 365, 12289.

- ^{xi} Thibault Fiolet et al (2018), Consumption of ultra-processed foods and cancer risk: results from NutriNet-Santé prospective cohort, *BMJ* 2018;360:k322 <http://dx.doi.org/10.1136/bmj.k322>
- ^{xii} Inge Huybrechts et al (2019), Ultra-processed food consumption and breast cancer risk, *Proceedings of the Nutrition Society* (2020), 79 (OCE2), E182, doi:10.1017/S0029665120001305 <https://doi.org/10.1017/S0029665120001305>
- ^{xiii} Elizabeth, L., Machado, P., Zinöcker, M., Baker, P., & Lawrence, M. (2020). Ultra-processed foods and health outcomes: a narrative review. *Nutrients*, 12(7), 1955. <https://pubmed.ncbi.nlm.nih.gov/32630022/>
- ^{xiv} Baker P, Machado P, Santos T, et al. . Ultra-processed foods and the nutrition transition: global, regional and national trends, food systems transformations and political economy drivers. *Obes Rev* 2020;21:e13126. 10.1111/obr.13126 <https://pubmed.ncbi.nlm.nih.gov/32761763/>
- ^{xv} Monteiro CA, Lawrence M, Millett C, et al. . The need to reshape global food processing: a call to the United Nations Food Systems Summit. *BMJ Glob Health* 2021;6:e006885. 10.1136/bmjgh-2021-006885 <https://gh.bmj.com/content/bmjgh/6/7/e006885.full.pdf>
- ^{xvi} Popkin BM, Barquera S, Corvalan C, et al. Towards unified and impactful policies to reduce ultra-processed food consumption and promote healthier eating. *Lancet Diabetes Endocrinol* 2021;9:462–70. 10.1016/S2213-8587(21)00078-4 [https://doi.org/10.1016/S2213-8587\(21\)00078-4](https://doi.org/10.1016/S2213-8587(21)00078-4)
- ^{xvii} Zefeng Zhang, Sandra L Jackson, Euridice Martinez, Cathleen Gillespie, Quanhe Yang, Association between ultraprocessed food intake and cardiovascular health in US adults: a cross-sectional analysis of the NHANES 2011–2016, *The American Journal of Clinical Nutrition*, Volume 113, Issue 2, February 2021, Pages 428–436, <https://doi.org/10.1093/ajcn/nqaa276>
- ^{xviii} Cotter T, Kotov A, Wang S, Murukutla N. 'Warning: ultra-processed' - A call for warnings on foods that aren't really foods. *BMJ Glob Health*. 2021;6(12):e007240. doi:10.1136/bmjgh-2021-007240 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8666852/>
- ^{xix} Dicken, Samuel J., and Rachel L. Batterham. 2022. "The Role of Diet Quality in Mediating the Association between Ultra-Processed Food Intake, Obesity and Health-Related Outcomes: A Review of Prospective Cohort Studies" *Nutrients* 14, no. 1: 23. <https://doi.org/10.3390/nu14010023>
- ^{xx} Matos RA, Adams M and Sabaté J (2021) Review: The Consumption of Ultra-Processed Foods and Non-communicable Diseases in Latin America. *Front. Nutr.* 8:622714. doi: 10.3389/fnut.2021.622714
- ^{xxi} Hall K.D. Ayuketah A, Brychta R et al. Ultra-processed diets cause excess calorie intake and weight gain: An inpatient randomized controlled trial of ad libitum food intake. *Cell Metab.* 2019; 30: 67-77.e3 <https://pubmed.ncbi.nlm.nih.gov/31105044/>
- ^{xxii} Callie M. McDonough, Hannah Shibo Xu & Tai L. Guo (2021) Toxicity of bisphenol analogues on the reproductive, nervous, and immune systems, and their relationships to gut microbiome and metabolism: insights from a multi-species comparison, *Critical Reviews in Toxicology*, 51:4, 283-300, DOI: 10.1080/10408444.2021.1908224 <https://www.tandfonline.com/doi/abs/10.1080/10408444.2021.1908224?journalCode=itxc20>
- ^{xxiii} Report of the technical consultation on measuring healthy diets: concepts, methods and metrics. Virtual meeting, 18–20 May 2021. Geneva: World Health Organization; 2021. <https://www.who.int/publications/i/item/9789240040274>
- ^{xxiv} Food marketing exposure and power and their associations with food-related attitudes, beliefs and behaviours: a narrative review ISBN 978-92-4-004178-3 [9789240041783-eng \(3\).pdf](https://www.who.int/publications/i/item/9789240041783-eng(3).pdf)
- ^{xxv} Tatlow-Golden, Mimi. (2016). Who's Feeding the Kids Online? Digital Food Marketing and Children in Ireland. 10.13140/RG.2.2.13036.77441 [10.13140/RG.2.2.13036.77441](https://www.researchgate.net/publication/31105044)
- ^{xxvi} Koios D, Machado P, Lacy-Nichols J. Representations of ultra-processed foods: a global analysis of how dietary guidelines refer to levels of food processing. *Int J Health Policy Manag.* 2022;x(x):x–x. doi: 10.34172/ijhpm.2022.6443 [10.34172/IJHPM.2022.6443](https://doi.org/10.34172/IJHPM.2022.6443)
- ^{xxvii} Monteiro CA, et al. *BMJ Global Health* 2021;6:e006885. doi:10.1136/bmjgh-2021-006885 <https://gh.bmj.com/content/bmjgh/6/7/e006885.full.pdf>
- ^{xxviii} A.H. Lichtenstein and L.J. Appel et al(2021), AHA SCIENTIFIC STATEMENT 2021 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement From the American Heart Association <https://www.ahajournals.org/doi/pdf/10.1161/CIR.0000000000001031>
- ^{xxix} Dietary guidelines for Brazilian children under 2 years of age, Ministry of Health of Brazil Secretariat of Primary Health Care Health Promotion, Department, 2021 [dietary_guidelines_brazilian_children_under_2_years_of_age](https://www.saude.gov.br/dietary-guidelines-brazilian-children-under-2-years-of-age) (saude.gov.br)
- ^{xxx} Canada's Food Guide <https://food-guide.canada.ca/en/healthy-eating-recommendations/limit-highly-processed-foods/>
- ^{xxxi} The High Council of Public Health. Quantified Public Health Objectives for Public Health Nutrition Policy (PNNS) 2018–2022. <https://www.hcsp.fr/explore.cgi/avisrapportsdomaine?clefr=648> (accessed 01 January 2022)
- ^{xxxii} Karlsen TH, Sheron N, Zelber-Sagi S, Carrieri P, Dusheiko G, Bugianesi E, Pryke R, Hutchinson SJ, Sangro B, Martin NK et al. The EASL-Lancet Liver Commission: protecting the next generation of Europeans against liver disease complications and premature mortality. *Lancet* 2021; Epub ahead of print; doi: 10.1016/S0140-6736(21)01701-3
- ^{xxxiii} Unseen Dangers of Ultra Processed Foods, BPNI-NAPi, 2020 <https://www.bpni.org/wp-content/uploads/2020/07/unseen2020.pdf>
- ^{xxxiv} Tobias, D.K. and K.D. Hall, Eliminate or reformulate ultra-processed foods? Biological mechanisms matter. *Cell Metab*, 2021. [https://www.cell.com/cell-metabolism/fulltext/S1550-4131\(21\)00483-6](https://www.cell.com/cell-metabolism/fulltext/S1550-4131(21)00483-6)
- ^{xxxv} Machado P, Baker P, Woods J, and Lawrence M., Eliminate or reformulate ultra-processed foods? Biological mechanisms matter, *VOLUME 33, ISSUE 12*, P2314-2315, DECEMBER 07, 2021 <https://doi.org/10.1016/j.cmet.2021.10.005>
- ^{xxxvi} Moodie R, Bennett E, Kwong E, et al. Ultra-processed profits: the political economy of countering the global spread of ultraprocessed foods - a synthesis review on the market and political practices of transnational food corporations and strategic public health responses. *Int J Health Policy Manag* 2021. DOI [10.34172/IJHPM.2021.45](https://doi.org/10.34172/IJHPM.2021.45)



Annexure 1 : NOVA food classification system according to its level of processing.

Food classification	Food example
Unmodified or minimally processed foods	Fresh/frozen fruits and vegetables, fresh meat, fresh milk, grains, eggs, fresh fish, nuts, granola, rice, beans, tubers, whole grain flour, herbs and spices, etc.
Processed foods as processed culinary ingredients	Extracted vegetable oils, substances isolated or modified by various preservation methods, salt, sugar, oil, fat, flour, white rice, pasta, butter extracted from fresh milk, extracted honey, starches extracted from corn and other plants, etc.
Processed foods	Vegetables and legumes modified or preserved with additives, salty or sugary nuts and seeds, canned meats and fish, canned fruits, fresh whole grain breads, fresh cheese, etc.
Ultra-processed foods	Industrial formulas with multiple ingredients, including: soft drinks, energy drinks, fruit nectar drinks, alcoholic beverages, distilled beverages, beer, refined cereal, breads, ready-to-eat meals, instant cereals, cookies, candy, sugary drinks, margarine, mayonnaise, chips, instant soups, confectionery, jams, chocolate, ice cream, cake, energy bars, dairy drinks, yogurts, processed cheese, pizza, pasta dishes, instant sauces, processed meat products, meat analogs, infant formulas, weight loss products such as meal replacement shakes and powders, etc.


Source: Adapted from Carlos A Monteiro et al (2018), Ultra-processed foods: what they are and how to identify them, Public Health Nutrition: 22(5), 936–941, doi:10.1017/S1368980018003762 [ultra-processed-foods-what-they-are-and-how-to-identify-them.pdf](https://doi.org/10.1017/S1368980018003762)

S.No	Name of the product	Picture	Ingredients and additives	Youtube Advertisement
1.	Kellogg's Corn Flakes Original, High in Iron, High in B Group Vitamins, Breakfast Cereals	 	<p>Corn grits (87.7 %), Sugar, cereal extract, Iodized salt, Vitamins, Minerals and Antioxidant (INS 320), contains Gluten. May contain traces of tree nuts</p> <p>Claim: Power of 5 nutrients and saves your time.</p>	https://www.youtube.com/watch?v=O4YjbAXVzo0
2.	Provee made with plant protein, Choco Malt, Ragi Badam		<p>Malt extract powder (65.0%), Jaggery powder (18.0%), Pea protein isolate (9.0%), cocoa solids (4.0%), nature-identical flavouring substances, minerals, vitamins, docosahexaenoic acid (DHA) and Trace elements</p> <p>Claim: Made with Jaggery Sugar support active mind, immunity and growth</p>	https://www.youtube.com/watch?v=XWYNDNW5h5c
3.	Hersheys Kisses milk Chocolate		<p>Sugar, Milk Solids (27%), Cocoa Butter, Cocoa Solids & Emulsifiers (476, 322 (i)). (Approximate Values) Contains Added Artificial Flavouring Substances (Vanillin)</p>	https://www.youtube.com/watch?v=fpUeuuWvg5c

Annexure-2

S.No	Name of the product	Picture	Ingredients and additives	Youtube Advertisement
4	Parle Monaco Cheeslings Classic Biscuit		Malt Extract (44%), Milk Solids (34%), Hydrolysed Corn Solids, Minerals, Natural Color, Nature Identical Flavouring Substances, Salt, Vegetable Juice Powder (Beetroot), Vitamins, Acidity Regulator, Artificial Sweetener	https://www.youtube.com/watch?v=d5soULp3yNw
5.	Patanjali Nutrela Kids Super Food		<p>Milk Solid, Sugar, High Oleic Sunflower Oil Powder, Calcium Caseinate, Cocoa Powder, Whey Protein Concentrate, Fructo-Oligosaccharides, Fructose, Maltodextrin, Cow Milk Calcium, Flavour, Colostrum Powder, Minerals premix, Soya Lecithin Powder, Distilled Monoglycerides, Xanthan gum, Dates Powder, Almonds Powder, Lutein, Walnut Extract, Flaxseed Extract, Vitamins blend, Brahmi extract, Shank Pushpi Powder, Vitamin K2-7, L – Taurine, Zinc salt, Soya extract, Rosehip Extract, Ashwagandha extract, Tulsi extract, Defatted Fenugreek fiber, Bio-Fermented mushroom extract.</p> <p>Claim: Super Food made with guidelines from ICMR and also claims active muscle mass, growth, memory and brain development and bone-teeth strength</p>	https://www.youtube.com/watch?v=Jjc0jtmfx5w

Annexure-2

S.No	Name of the product	Picture	Ingredients and additives	Youtube Advertisement
6.	Coca Cola Coke Zero Soft Drink - No Sugar, 300 ml Can		Carbonated Water, Acidity Regulator (338, 331), Sweeteners (951,950), Caffeine & Preservative (211). Contains Permitted Natural Colour (150D) and Added Flavours (Natural Flavouring Substances). Contains No Fruit.	https://www.youtube.com/watch?v=RB3DkNRwj2o&t=3s