EU Food Law, Consumer Harm and Ultra-Processed Food Markets

Abstract

This article examines the limitations of the European Union's food safety framework in addressing the long-term health risks posed by UPFs. While the EU's regulatory approach effectively mitigates immediate hazards from contamination and acute foodborne threats, it lacks provisions to address the cumulative harm from prolonged UPF consumption. This "slow harm" manifests through chronic health concerns like obesity, diabetes, and cardiovascular diseases, resulting from sustained intake of products low in fiber, high in sugars, unhealthy fats, and artificial additives. Drawing on the "slow harm" scholarship, the article critiques how EU regulations, focused on individual product safety and consumer empowerment, inadequately protect consumers from the broader, industry-wide impacts of UPFs. It argues that the EU's reliance on labelling and information-based consumer choice places undue responsibility on individuals, disregarding socioeconomic factors that influence dietary choices. Vulnerable groups, particularly lower-income populations, are disproportionately affected due to limited access to healthier food options. The article calls for a reframing of EU food safety law framework to integrate cumulative, industry-wide health risks and advocates for a policy shift that balances individual choice with structural protections against UPF-related health disparities. This reframing would mark a significant regulatory development, aligning EU food law with contemporary consumer protection and public health challenges.

1. Introduction

The development of EU food law has been shaped by two main regulatory stages, each with distinct motivations and outcomes. [1] The first stage, beginning in the 1960s and lasting through the early 1990s, was primarily trade-focused, designed to create a unified internal market by harmonising food standards across Member States. [2] The goal was to facilitate the free movement of goods as outlined in the Treaty of Rome (1957) (TFEU, Article 3(1)). This period saw the adoption of vertical directives targeting specific product standards, later supplemented by horizontal directives that applied to broader categories of food products. [3] Although this

[1] Bernd van der Meulen, 'Is Current EU Food Safety Law Geared up for Fighting Food Fraud?' (2015) 10 Journal für Verbraucherschutz und Lebensmittelsicherheit 19.
[2] Anna Lopez, 'Adding Insult to Injury: Food Additives and U.S./ EU International Trade' (2016) 6 Notre Dame Journal of International & Comparative Law <https://scholarship.law.nd.edu/ndjicl/vol6/iss1/16>.
[3] Bernd van der Meulen, 'The Core of Food Law: A Critical Reflection on the Single Most Important Provision in All of EU Food Law' (2012) 7 European Food and Feed Law Review 117.

regulatory focus removed trade barriers and encouraged economic integration, it left consumer health and safety protections underdeveloped. In this trade-centred framework, food law prioritised the ease of commerce over a proactive approach to consumer well-being.

A shift toward consumer safety emerged in the mid-1990s in response to a series of food safety crises, most notably the Bovine Spongiform Encephalopathy (BSE) outbreak. [4] This incident, among others, highlighted serious inadequacies in the EU's approach to food safety, resulting in a comprehensive shift in regulatory priorities. In 2000, the European Commission published the "White Paper on Food Safety," setting the agenda for a second stage in EU food law focused on consumer protection against food hazards (COM/99/719 final). Central to this new framework was Regulation (EC) No 178/2002, the General Food Law (GFL), which introduced science-based risk analysis as a regulatory principle and established the European Food Safety Authority (EFSA). EFSA's role was to provide scientific risk assessments to guide EU policymakers in preventing food hazards. Complementary legislation, such as the Hygiene Package (Regulations (EC) No 852/2004, 853/2004, and 854/2004) and Regulation (EC) No 882/2004 on official controls, outlined food business operators' responsibilities for maintaining safety, while public authorities assumed a supervisory role. [5]

However, the response-oriented design of this second regulatory stage, it is argued here, constrained EU food law's understanding of food hazards, which are narrowly defined as biological, chemical, and physical threats to safety. This definition excludes what can be termed "slow harm": gradual, cumulative harm that arises from long-term consumption of foods like UPFs.[6] Unlike the immediate, identifiable dangers that the current food safety framework was built to manage, the risks associated with UPFs are diffuse and emerge incrementally. Slow harm manifests over time, often through prolonged exposure to multiple products from various providers rather than a single, acute incident. The health consequences of UPFs—obesity,

[4] Bente Halkier and Lotte Holm, 'Shifting Responsibilities for Food Safety in Europe: An Introduction' (2006) 47 Appetite 127.

[5] Van der Meulen, 'The Structure of European Food Law' (2013) 2 Laws 69.

[6] The scientific definition of UPFs was created by a Brazilian team of nutritional scientists in 2010, led by Prof Carlos Monteiro, and since has been widely taken up and used by the scientific community to further research on UPF impact on population health. Carlos Monteiro, a Brazilian nutrition researcher, defines ultra-processed foods (UPFs) as industrially manufactured products composed of multiple ingredients, including sugars, oils, fats, and salt, often combined in higher amounts than in processed foods. These products frequently contain substances not commonly used in culinary preparations, such as high-fructose corn syrup, hydrogenated oils, modified starches, and protein isolates. The manufacturing processes involve industrial techniques like extrusion, moulding, and pre-frying, along with the addition of additives designed to enhance flavour, colour, and texture, making the final product highly palatable or even hyper-palatable. These additives include flavours, colorants, non-sugar sweeteners, and emulsifiers. The primary purpose of UPFs is to create convenient, ready-to-eat or ready-to-heat products that are highly profitable due to their low-cost ingredients, long shelf life, and appealing branding. They are designed to serve as attractive alternatives to minimally processed foods and freshly prepared meals Carlos A Monteiro and others, 'NOVA. The Star Shines Bright' (2016) 7 World Nutrition 28.

diabetes, inflammatory bowel, dementia and cardiovascular diseases—develop slowly, making it difficult to address them within the existing EU food safety paradigm, which emphasises rapid-response mechanisms and strict contamination controls for acute risks.

As a result, the current EU framework places the responsibility for managing such slow harm squarely on consumers. This approach, often referred to as the 'informational paradigm', relies on food labelling and nutrition information as the primary means of consumer protection.[7] While labelling is important for informed choice, it shifts the burden of managing long-term dietary health risks onto individuals. This responsibility may be especially challenging for vulnerable groups who may lack access to the resources or knowledge needed to manage their exposure to slow harm effectively. The over-reliance on consumer responsibility through labelling fails to account for the unequal ability of different consumer groups to avoid or minimise harm from UPF consumption, which has been shown to disproportionately affect lower-income populations and those with limited time resources and limited access to fresh, nutritious foods.

This article draws on the concept of "slow harm" to critically examine the limitations of the EU's current food safety framework. It asked: how does EU food law regulate UPF markets? How does EU food law conceptualise harm and how does it seek to address harm generated by UPFs? This article argues that EU food safety law overlooks the insidious, cumulative risks posed by UPFs, failing to address what is arguably one of the most pressing consumer protection issues in modern food markets. Slow harm is not adequately recognised as a food safety concern, leaving consumers vulnerable to its long-term effects and exacerbating health disparities across consumer groups. This article suggests that the EU's limited conceptualisation of food safety, focused narrowly on immediate hazards, excludes slow harm from its regulatory scope and pushes the responsibility for managing such risks onto consumers through food labelling. Consequently, those who are least able to navigate these risks remain the most exposed.

The article calls for a reconsideration of the EU food safety framework to integrate slow harm as a regulatory concern of food safety. Including slow harm within the food safety regulatory scope would better reflect the realities of modern food markets and provide a more equitable framework for protecting public health. As UPF consumption continues to rise, it

[7] Nikhil Gokani, 'Front-of-Pack Nutrition Labelling: A Tussle between EU Food Law and National Measures' (2022) 47 European Law Review 153; N Gokani, 'Healthier Food Choices: From Consumer Information to Consumer Empowerment in EU Law' (2024) 47 Journal of Consumer Policy 271; Hendrik NJ Schifferstein, Alie de Boer and Mailin Lemke, 'Conveying Information through Food Packaging: A Literature Review Comparing Legislation with Consumer Perception' (2021) 86 Journal of Functional Foods 104734.

becomes increasingly urgent to address the uneven exposure to slow harm across consumer groups, with those most vulnerable to dietary health risks disproportionately impacted. Recognising slow harm as a food safety issue would mark an important shift in EU food law, aligning it more closely with contemporary public health challenges and fostering a more protective regulatory approach.

This article is structured as follows: Section 2 introduces slow violence scholarship to explain how UPFs inflict gradual, often invisible harm, especially on marginalised communities. Section 3 critiques the EU's reliance on individual producer accountability, which is effective for managing immediate risks but insufficient for addressing the widespread, cumulative health impacts associated with UPFs. Section 4 assesses the EU's consumer empowerment approach, arguing that reliance on labelling places responsibility on individuals to manage dietary risks, overlooking the structural inequalities that restrict healthy food choices, particularly for lower-income populations. Finally, the conclusion calls for a shift in EU food law, advocating for regulatory reform that recognises the systemic, slow harm associated with UPFs and seeks to better protect public health by addressing these cumulative risks at an industry-wide level.

2. Slow violence, slow harm and UPF markets

The concept of "slow violence", as initially formulated by Nixon, [8] has resulted in a rich body of interdisciplinary research that examines the ways in which harm and suffering are enacted gradually, often invisibly, over extended periods. Nixon's work challenges conventional understandings of violence as immediate, explosive, and spectacular, emphasising instead a form of violence that is "incremental and accretive," where its effects unfold subtly and insidiously, often making it challenging to identify responsible parties or demand accountability. [9] This concept has proven particularly powerful in environmental justice scholarship, which uses the framework of slow violence to interrogate the gradual harms caused by pollution, climate change, and toxic exposure. [10]

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[8] *Slow Violence and the Environment* (Harvard University Press 2011) <https://www.hup.harvard.edu/books/9780674072343> accessed 13 June 2024.

[9] ibid.

[10] Thom Davies, 'Slow Violence and Toxic Geographies: "Out of Sight" to Whom?' (2022) 40 Environment and Planning C: Politics and Space 409; Sarah Marie Wiebe, *Everyday Exposure* (UBC Press 2016) <https://www.ubcpress.ca/everyday-exposure> accessed 13 June 2024; Jennifer L Willett, 'The Slow Violence of Climate Change in Poor Rural Kenyan Communities: "Water Is Life. Water Is Everything."' (2015) 7 Contemporary Rural Social Work Journal <https://digitalcommons.murraystate.edu/crsw/vol7/iss1/6> accessed 13 June 2024; Kathryn Yusoff, *A Billion Black Anthropocenes or None* (University of Minnesota Press 2018)

Nixon's focus on environmental degradation as a form of slow violence has inspired numerous studies investigating how environmental toxins and pollution inflict harm on marginalised communities in ways that are difficult to measure and thus is often overlooked. Davies[11] has explored the cumulative effects of industrial pollution on communities located near waste disposal sites, revealing how residents suffer from chronic illnesses and deteriorating health over time due to prolonged exposure. Similarly, Wiebe[12] has examined the ecological destruction and health hazards faced by Indigenous communities in Canada as a result of resource extraction, such as mining and deforestation, which disproportionately impacts their traditional lands.

Yusoff has introduced a critical perspective on environmental slow violence by exploring its colonial dimensions, showing how the extraction of natural resources from Indigenous lands is both a form of material dispossession and an erasure of cultural identity.[13] This approach demonstrates that environmental harm is not only slow and cumulative but also intimately linked to histories of colonial exploitation, wherein marginalised communities are systematically excluded from political processes that shape environmental policies and regulations. These engagements, extending Nixon's foundational arguments, push for a recognition of violence that is routinised, slow-moving, and obscured by bureaucratic or economic processes that make it appear as a 'normal' aspect of development and progress.

The framework of slow violence has also been applied to critique the often-hidden violence enacted by state programs and policies. Bendixsen and Eriksen[14] have studied how welfare state retrenchment policies in Europe have contributed to the gradual immiseration of low-income populations, with reductions in social benefits and services leading to increased homelessness, food insecurity, and health deterioration. Benwell et al. [15] similarly have analysed how austerity policies, implemented in response to economic crises, exacerbate the vulnerability of communities, compounding their precarity and undermining long-term health and well-being. Structural adjustment programs, particularly those imposed on Global South nations by international financial institutions, are another site of investigation for slow violence

[11] Davies (n 10).
[12] Wiebe (n 10).
[13] Yusoff (n 10).
[14] 'The Neoliberal Welfare State and Its Discontents. Slow Violence against Irregular Migrants in Norway' (2024) 50 Journal of Ethnic and Migration Studies 2747.
[15] 'The Slow Violence of Austerity Politics and the UK's "Hostile Environment": Examining the Responses of Third Sector Organisations Supporting People Seeking Asylum' (2023) 145 Geoforum 103845.

scholars. Blake and Barney[16] and Burte and Kamath[17] have argued that these programs, which often demand cuts to social spending and public services, inflict long-term harm on populations that rely on state support for basic needs. The gradual dismantling of social infrastructures under these programs creates a form of violence that is less visible than direct physical harm but is no less damaging in its cumulative effects. By analysing these policies as forms of slow violence, scholars reveal the ways in which the seemingly neutral, 'technical' processes of economic restructuring mask profound social and human costs.

Feminist scholars have expanded the concept of slow violence to include an analysis of how gender, race, class, and ability shape experiences of harm over time.[18] These scholars have demonstrated that the effects of slow violence are not evenly distributed but are mediated by intersecting systems of oppression that exacerbate vulnerability for particular groups. Anderson et al. [19] and Belt [20] have shown how women, particularly those from marginalised racial and economic backgrounds, experience cumulative harm from policies and practices that restrict access to healthcare, housing, and employment. For instance, Hsu[21] has investigated how immigration policies in Western nations place migrant women in precarious, low-wage labour, exposing them to chronic stress, health risks, and long-term economic instability.

A significant body of work has examined how racism and sexism interact over time to produce poor health outcomes for Black women. Gilmore[22], Lorde[23], and Minich[24] have mapped out how the cumulative effects of discrimination, restricted access to healthcare, and exposure to hazardous work and living conditions lead to disproportionately high rates of

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[16] 'Structural Injustice, Slow Violence? The Political Ecology of a "Best Practice" Hydropower Dam in Lao PDR' (2018) 48 Journal of Contemporary Asia 808.

[17] 'The Structural Violence of Spatial Transformation: Urban Development and the More-than-Neoliberal State in the Global South' (2023) 27 City 448.

[18] Katherine Brickell, 'Slow Violence, over-Indebtedness, and the Politics of (in)Visibility: Stories and Creative Practices in Pandemic Times' (2024) 110 Political Geography 102842; Davies (n 10); Susan Grieshaber and Susan Krieg, 'Gendering and Slow Violence as Mundane Political Practice in Early Childhood Education' [2024] Critical Studies in Education <https://www.tandfonline.com/doi/abs/10.1080/17508487.2024.2368814> accessed 12 November 2024; Leanne Higham, 'Attending to Slow Violence: From Pride to Stand Out' (2024) 51 The Australian Educational Researcher 889; Filiberto Penados, Levi Gahman and Shelda-Jane Smith, 'Land, Race, and (Slow) Violence: Indigenous Resistance to Racial Capitalism and the Coloniality of Development in the Caribbean' (2023) 145 Geoforum 103602.

[19] 'Slow Emergencies: Temporality and the Racialized Biopolitics of Emergency Governance' (2020) 44 Progress in Human Geography 621.

[20] 'The Fat Prisoners' Dilemma: Slow Violence, Intersectionality, and a Disability Rights Framework for the Future' (2021) 110 Georgetown Law Journal 785.

[21] 'Dispatches from a Body on Fire: Slow Death at the Intersections of Race, Gender, and Disability' (2024) 0 Quarterly Journal of Speech 1.

[22] *Golden Gulag: Prisons, Surplus, Crisis, and Opposit* (2007).

[23] *The Cancer* (1997) <https://www.penguin.co.uk/books/317725/the-cancer-journals-by-lorde-audre/9780241453506> accessed 14 June 2024.

[24] *Radical Health: Unwellness* (Duke University Press 2023). *at inx Express*

illness and premature death among Black women. Smith's[25] concept of "slow police violence" has further developed this idea, suggesting that Black women may suffer the long-term, indirect effects of police brutality—such as stress-related illnesses and community trauma—even if they are not the immediate targets of physical violence.

Within disability studies, scholars like Mills and Pring[26] have analysed the effects of slow violence on disabled populations, particularly in the context of welfare cuts and healthcare restrictions. These cuts, which reduce access to essential services, contribute to what Mills and Pring have described as a form of "social death," where disabled individuals are gradually isolated from society and denied the resources necessary for survival.[27] This slow harm is perpetuated by ableist assumptions that cast disabled lives as less valuable, thereby justifying reductions in support as seemingly rational or necessary state policy.

The concept of slow harm, closely related to slow violence, expands on these ideas by examining how economic precarity and unstable working conditions generate long-term harm. Hill[28] and Stewart and Sanders[29] have argued that work precarity, often exacerbated by neoliberal labour policies, acts as a form of slow harm that inflicts mental and physical stress on low-wage workers. These scholars have shown that precarious employment, with its lack of benefits and job security, leads to chronic stress, anxiety, and health deterioration over time.[30]

Similarly, research on housing insecurity reveals how unstable living conditions function as a form of slow harm, contributing to mental health challenges, disrupted family life, and diminished quality of life. Piedalue,[31] for example, has demonstrated how women, particularly single mothers, face long-term harm due to discriminatory housing policies that limit their access to affordable and stable housing.

In this article, I argue that the concepts of slow violence and slow harm should be applied to understanding UPF markets, with particular attention to the slow harm they inflict

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[25] 'Slow Death: Is the Trauma of Police Violence Killing Black Women?' (*The Conversation*, 12 July 2016) <http://theconversation.com/slow-death-is-the-trauma-of-police-violence-killing-black-women-62264> accessed 14 June 2024.

[26] 'Weaponising Time in the War on Welfare: Slow Violence and Deaths of Disabled People within the UK's Social Security System' (2024) 44 Critical Social Policy 129.

[27] ibid.

[28] 'Intersectionality and UK's Multiscalar Governance Approach to Race, Gender and Asylum-Seeking in Scotland and England', *Immigrant Lives: Intersectional Trans* (Oxford University Press 2023).

[29] 'Enduring Borders: Precarity, Swift Falls and Stretched Time in the Lives of Migrants Experiencing Homelessness in the UK' (2024) 58 Sociology 403.

[30] Hill (n 28); Stewart and Sanders (n 29).

[31] 'Slow Nonviolence: Muslim Women Resisting the Everyday Violence of Dispossession and Marginalization' (2022) 40 Environment and Planning C: Politics and Space 373.

on consumers. Although scholarship on slow violence and slow harm has yet to focus directly on UPF markets, this framework provides a powerful tool for illuminating the extensive, gradual harms perpetuated by UPF systems.

Food system scholars have long critiqued the globalized, capitalist structures underpinning food production, distribution, and consumption, highlighting the cumulative social and environmental impacts of UPFs. These critiques have shown how globalization[32], the influence of multinational corporations[33], the role of international organizations[34], and technological advancements[35] have contributed to a food system that prioritises profit over public health and ecological sustainability. What is more, research on nutritional inequities has used the slow harm framework to examine how systemic factors shape access to food, dietary choices, and long-term health outcomes. Freeman has explored how food deserts and economic constraints systematically limit access to fresh, nutritious foods, forcing low-income populations into reliance on cheap, low-nutrient junk food that dominate market supply chains.[36] Similarly, Crowe et al. have argued that food insecurity functions as a slow-moving form of structural violence, where the gradual effects of inadequate nutrition manifest in chronic health conditions such as diabetes and cardiovascular disease.[37] These studies reveal how nutritional disparities are not incidental but rather embedded within broader socio-economic and policy-driven food environments that shape market structures and consumer accessibility. The effects of these forces are not only immediate but also insidious, with harms unfolding gradually and invisibly over time—characteristics that resonate strongly with the concept of slow harm.

This slow harm is evident in how UPF markets sustain inequitable food systems that impact economically marginalised communities most acutely. Scholars have shown how

[32] Jennifer Zwagerman, 'Recognizing Challenges and Opportunities in the Quest to End Hunger' (21 June 2017) <https://papers.ssrn.com/abstract=2989736> accessed 10 July 2024.
[33] Thomas Cheney, 'Historical Materialism and Alternative Food: Alienation, Division of Labour, and the Production of Consumption' (2016) 11 Socialist Studies/Études Socialistes 105.
[34] Hilal Elver, 'The Challenges and Developments of the Right to Food in the 21 St Century: Reflections of the United Nations Special Rapporteur on the Right to Food' (2016) 20 UCLA Journal of International Law and Foreign Affairs 1.
[35] Rebecca M Bratspies, 'Hunger and Equity in an Era of Genetic Engineering' [2017] SSRN Electronic Journal <https://www.ssrn.com/abstract=3088043> accessed 10 July 2024.
[36] Andrea Freeman, 'Unconstitutional Food Inequality' (2020) 55 Harvard Civil Rights- Civil Liberties Law Review 840.
[37] Jessica Crowe, Constance Lacy and Yolanda Columbus, 'Barriers to Food Security and Community Stress in an Urban Food Desert' (2018) 2 Urban Science 46.

evolving work patterns, shifts in social welfare policies,[38] and structural inequalities[39] perpetuate these harmful systems, affecting consumers' choices and health. By reinforcing conditions in which UPFs are accessible, affordable, and heavily marketed, UPF markets contribute to declining health outcomes and deepening social inequities, distributing harm unevenly along socioeconomic lines. The global reach of UPF markets also erodes local, small-scale farming[40] and imposes exploitative labour conditions, with transnational corporations holding significant power over small farmers and food workers. These conditions not only favour large retailers but also diminish local food sovereignty and resilience[41], generating a form of harm that, like slow violence, is concealed within the global food supply chain.

Importantly, UPF consumption has now been extensively linked to a range of adverse health outcomes, providing further grounds for analysing these markets as sites of slow harm. Recent studies have shown strong associations between UPF consumption and various non-communicable diseases, including Type 2 diabetes[42], cardiovascular disease[43], hypertension[44],

[38] Julie Smith, Judith Galtry and Libby Salmon, 'Confronting the Formula Feeding Epidemic in a New Era of Trade and Investment Liberalisation' [2014] Journal of Australian Political Economy 132.

[39] Andrea Freeman, 'Unconstitutional Food Inequality' (22 October 2020) <https://papers.ssrn.com/abstract=3717230> accessed 10 July 2024; Stephen Lee, 'The Food We Eat and the People Who Feed Us' (2017) 94 Washington University Law Review 1249.

[40] Martha McMahon, 'Standard Fare or Fairer Standards: Feminist Reflections on Agri-Food Governance' (2011) 28 Agriculture and Human Values 401; Martha McMahon, 'What Food Is to Be Kept Safe and for Whom? Food-Safety Governance in an Unsafe Food System' (2013) 2 Laws 401.

[41] Sara Byala, *Bottled: How Coca-Cola Became African* (C Hurst & Co Publishers Ltd 2023); Jennifer Clapp and others, *Corporate Power in Global Agrifood Governance* (1st edition, MIT Press 2009); Liam Keenan, Timothy Monteath and Dariusz Wójcik, 'Hungry for Power: Financialization and the Concentration of Corporate Control in the Global Food System' (2023) 147 Geoforum 103909; McMahon (n 40); Marion Nestle, *Food Politics: How the Food Industry Influences Nutrition and Health* (1st edn, University of California Press 2013) <https://www.jstor.org/stable/10.1525/j.ctt7zw29z> accessed 6 June 2024; Anthony Winson, 'The Industrial Diet: The Degradation of Food and the Struggle for Healthy Eating, Winson' (August 2013) <https://press.uchicago.edu/ucp/books/book/distributed/I/bo70049278.html> accessed 6 June 2024.

[42] María Llavero-Valero and others, 'Ultra-Processed Foods and Type-2 Diabetes Risk in the SUN Project: A Prospective Cohort Study' (2021) 40 Clinical Nutrition 2817; Bernard Srour and others, 'Ultraprocessed Food Consumption and Risk of Type 2 Diabetes Among Participants of the NutriNet-Santé Prospective Cohort' (2020) 180 JAMA internal medicine 283.

[43] Marialaura Bonaccio and others, 'Ultra-Processed Food Consumption Is Associated with Increased Risk of All-Cause and Cardiovascular Mortality in the Moli-Sani Study' (2021) 113 The American Journal of Clinical Nutrition 446; Bernard Srour and others, 'Ultra-Processed Food Intake and Risk of Cardiovascular Disease: Prospective Cohort Study (NutriNet-Santé)' (2019) 365 BMJ (Clinical research ed.) l1451.

[44] Susan L Prescott, Ashka Naik and Alan C Logan, 'Not Food: Time to Call Ultra-Processed Products by Their True Name' (2024) 2 Gastronomy 47.

high blood pressure[45], inflammatory bowel disease[46], fatty liver disease[47], cancers[48], frailty[49], depression[50], and even dementia.[51] The health risks are significant, with some studies indicating that UPF consumption increases the likelihood of these diseases by 25% to 62% [52]. These findings align with the framework of slow harm, where health deterioration occurs gradually, masked by the everyday consumption of easily accessible UPFs.

For children, UPF-driven diets pose additional, often lifelong health risks. Public health organizations and charities have raised concerns over the increasing rates of childhood obesity and malnutrition linked to commercially produced foods, such as infant formulas, toddler snacks, and other UPF items marketed for children.[53] This early dependence on UPFs reveals a slow harm that begins in childhood, potentially leading to chronic health issues that manifest much later in life. The embeddedness of UPFs in daily life reflects the hidden, prolonged nature of slow violence, with harms accumulating quietly and largely unnoticed.

I suggest that adopting the framework of slow harm offers a critical approach to studying UPF markets, drawing attention to the gradual, often invisible harm that these markets inflict on consumers. Applying this framework emphasises the systemic nature of UPF-related

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[45] Mariana Zogbi Jardim and others, 'Ultra-Processed Foods Increase Noncommunicable Chronic Disease Risk' (2021) 95 Nutrition Research (New York, N.Y.) 19; Talitha Silva Meneguelli and others, 'Food Consumption by Degree of Processing and Cardiometabolic Risk: A Systematic Review' (2020) 71 International Journal of Food Sciences and Nutrition 678.

[46] Chun-Han Lo and others, 'Ultra-Processed Foods and Risk of Crohn's Disease and Ulcerative Colitis: A Prospective Cohort Study' (2022) 20 Clinical Gastroenterology and Hepatology e1323; Neeraj Narula and others, 'Association of Ultra-Processed Food Intake with Risk of Inflammatory Bowel Disease: Prospective Cohort Study' (2021) 374 BMJ (Clinical research ed.) n1554.

[47] Shunming Zhang and others, 'Ultra-Processed Food Consumption and the Risk of Non-Alcoholic Fatty Liver Disease in the Tianjin Chronic Low-Grade Systemic Inflammation and Health Cohort Study' (2022) 51 International Journal of Epidemiology 237.

[48] Thibault Fiolet and others, 'Consumption of Ultra-Processed Foods and Cancer Risk: Results from NutriNet-Santé Prospective Cohort' (2018) 360 BMJ (Clinical research ed.) k322.

[49] Shunming Zhang and others, 'Ultra-Processed Food Intake Is Associated with Grip Strength Decline in Middle-Aged and Older Adults: A Prospective Analysis of the TCLSIH Study' (2022) 61 European Journal of Nutrition 1331.

[50] Clara Gómez-Donoso and others, 'Ultra-Processed Food Consumption and the Incidence of Depression in a Mediterranean Cohort: The SUN Project' (2020) 59 European Journal of Nutrition 1093.

[51] Huiping Li and others, 'Association of Ultraprocessed Food Consumption With Risk of Dementia: A Prospective Cohort Study' (2022) 99 Neurology e1056.

[52] Bonaccio and others (n 43); Xuanli Chen and others, 'Associations of Ultra-Processed Food Consumption with Cardiovascular Disease and All-Cause Mortality: UK Biobank' (2022) 32 European Journal of Public Health 779; Anaïs Rico-Campà and others, 'Association between Consumption of Ultra-Processed Foods and All Cause Mortality: SUN Prospective Cohort Study' (2019) 365 BMJ (Clinical research ed.) l1949.

[53] Valeria Calcaterra and others, 'Ultra-Processed Food, Reward System and Childhood Obesity' (2023) 10 Children 804; Rachel Childs and Vicky Sibson, 'Ultra-Processed Foods Marketed for Infants and Young Children in the UK — First Steps Nutrition Trust' (First Steps Nutrition Trust 2023) <https://www.firststepsnutrition.org/upfs-marketed-for-infants-and-young-children> accessed 5 June 2024; Jo Peden and Julie Bishop, 'Rapid Review of Ultra-Processed Food and Obesity' (Public Health Wales 2018) <https://phw.nhs.wales/topics/overweight-and-obesity/rapid-review-of-ultra-processed-food-and-obesity/> accessed 21 February 2024.

harms, shifting the focus away from individual responsibility and towards the broader social, economic, and environmental forces shaping consumption patterns. This perspective also highlights the need to consider how EU food policy and law understands and approaches the underlying structures of slow harm and the cumulative, invisible impacts of UPF markets, the question I shall turn to next.

3. EU food law and the regulation of UPF markets

The European Union's General Food Law aims to protect consumers from both immediate and long-term harm by ensuring that food placed on the market is not "injurious to health" (Article 14(2)(a) of Regulation (EC) No 178/2002). This provision defines long-term harm as including the "cumulative toxic effects" of food consumption over time, a concept primarily and specifically governed by EU food safety laws and assessed by the European Food Safety Authority (EFSA). EFSA's risk assessments evaluate potential long-term health risks associated with food substances, focusing on maximum residue levels, acceptable daily intakes (ADIs) for additives, and thresholds for contaminants. However, because the definition of harm within EU food law is closely tied to the identification of food hazards, it is inherently constrained by the narrow scope of what constitutes a hazard. The law primarily recognises three categories—biological (e.g., pathogens), chemical (e.g., contaminants), and physical hazards (e.g., foreign objects in food)—which, while essential for food safety, fail to capture a broader and more insidious form of long-term harm, "slow harm" that specifically emanates from UPF markets.

In particular, the EU's food safety regulatory framework does not adequately consider the cumulative and synergistic health risks posed by (a) repeated exposure to nutritionally poor, ultra-processed foods across the market; (b) industrial food processing, and (c) a cocktail of food additives. These three risks and their assessment is currently outside of the EFSA's regulatory purview as well as outside of the broader, hazard-based model of EU food safety law. As a result, despite the legal recognition of cumulative toxicity,[54] the EU's food safety framework remains unequipped to address the long-term, incremental harm caused by the widespread consumption of UPFs. Below, I focus in greater detail on these three specific instances of risks to explain their association with the slow harm within UPF markets.

[54] This "cumulative toxicity" is assessed only for individual food additives, rather than the combined effects of multiple additives commonly found in most UPFs.

3. Individual Producer Responsibility vs. Cu

The European Union's food safety framework is primarily structured to ensure the safety of individual products and to assign responsibility to individual food producers under the General Food Law (Regulation EC 178/2002). This regulation establishes the core principles of food safety, transparency, and precaution, aiming to ensure that food products on the EU market do not pose health risks to consumers. Article 14 mandates that food must be free from health hazards, empowering national authorities to initiate recalls or product withdrawals if a specific item is deemed "injurious to health" or "unfit for consumption" (Regulation EC 178/2002). This producer-centred liability framework targets specific, identifiable risks, typically focusing on contamination, spoilage, or exposure to pathogens, and holds individual producers accountable for the safety of their own products.

This approach has proven effective in addressing traditional food safety issues where hazards are immediate and directly linked to specific products or identifiable failures within a single production chain.[55] The framework emphasises a reactive stance, where intervention occurs if an immediate risk to consumers is detected. This method is well-suited to handling crises such as bacterial contamination in a batch of meat or the presence of allergens in a mislabelled product. It allows regulators to act quickly to protect consumers from acute health threats, enforcing strict standards on food producers to avoid risks that could harm their customers.

However, this approach overlooks a fundamental challenge: the cumulative harm that emerges not from a single product or producer but across the entire UPF sector. Unlike traditional foodborne hazards—which can be traced back to specific contaminants or production faults—health risks associated with UPFs are cumulative and diffuse, arising from prolonged consumption of various similar products from multiple producers. This cumulative harm, which I have termed here as "slow harm," does not fit the EU's regulatory focus on acute, product-specific risks. Instead, it develops over time, as repeated consumption of unhealthy foods, often with high levels of sugars, unhealthy fats, salts, and artificial additives, increases the risk of chronic health conditions.

For instance, consuming a single bottle of Coca-Cola or one pack of industrially produced biscuits might not present an immediate or even long-term health risk. However, a habitual diet that regularly includes such similar products is strongly linked to increased risks

[55] Giulia Bazzan, 'Effective Governance of Food Safety Regulation across EU Member States: Towards Operationalization' (2017) 8 European Journal of Risk Regulation 565.

of obesity, Type 2 diabetes, cardiovascular disease, and other chronic conditions.[56] The health impacts of UPFs result from long-term dietary patterns rather than isolated consumption, representing a shift from acute to chronic risk. Since each product alone does not cross a harmful threshold, the EU's current regulatory approach, which focuses on acute hazards and producer-specific accountability, is insufficient for addressing this broader, market-wide health concern.

Moreover, the structure of the UPF market complicates regulatory efforts. Ultra-processed foods are manufactured by numerous companies, each responsible for only a fragment of the market but collectively creating a pervasive presence in European diets. Each producer follows regulatory guidelines individually, ensuring their products meet safety standards in isolation. Yet, these products collectively shape dietary habits characterised by low nutritional quality, ultra-processing and reliance on additives that are permissible in small quantities but contribute to long-term health risks when consumed in large amounts over time.[57] This fragmentation obscures accountability for cumulative harm since no single producer or product is solely responsible for the widespread dietary impacts associated with UPFs.

Because EU food safety law is focused on individual producer responsibility, it does not account for the cumulative, market-wide impact of the UPF sector, where multiple producers collectively contribute to dietary patterns associated with chronic illness. Consequently, regulatory attention remains on acute hazards associated with individual products, leaving the broader, industry-wide issue of cumulative dietary harm largely unaddressed. This gap in the framework means that regulatory measures are not currently equipped to mitigate the slow-building public health crisis posed by high UPF consumption.

3.2. The Problem with Food Processing

Another limitation of the EU's food safety framework is its narrow definition of "food hazards," which focuses on biological, chemical, and physical threats to safety, without considering the risks associated with excessive food processing itself (Regulation EC 178/2002). Ultra-processed foods, defined by extensive industrial processing, often contain minimal whole food ingredients and instead rely on refined sugars, trans fats, preservatives, and artificial additives.[58] This excessive processing alters the nutritional profile of food in ways

[56] Srour and others (n 42); Carlos Augusto Monteiro and others, 'The UN Decade of Nutrition, the NOVA Food Classification and the Trouble with Ultra-Processing' (2018) 21 Public Health Nutrition 5.
[57] Fiolet and others (n 48); Monteiro and others (n 56).
[58] Melissa M Lane and others, 'Ultra-Processed Food Exposure and Adverse Health Outcomes: Umbrella Review of Epidemiological Meta-Analyses' (2024) 384 BMJ e077310; Monteiro and others (n 56); Chris van Tulleken,

that can negatively impact long-term health, even though the individual components meet current safety standards. Research studies have shown that industrial processing techniques, such as refining, bleaching, and high-temperature cooking, often strip away essential nutrients found in whole foods.[59] For example, Many UPFs are made with refined grains and sugars that have been stripped of fiber, a key component in regulating blood sugar and supporting gut health. Fiber is essential for slowing down digestion and maintaining satiety, reducing the likelihood of overeating.[60] Without fiber, foods digest more quickly, leading to rapid spikes in blood sugar and insulin levels, which can increase the risk of metabolic diseases over time. Moreover, processing often involves high temperatures, chemical treatments, and mechanical processes that destroy or significantly reduce the levels of vitamins and minerals.[61] For instance, vitamin C and several B vitamins are highly sensitive to heat and are largely degraded during the high-temperature processes used to make many UPFs. As a result, these foods become 'energy-rich but nutrient-poor', providing calories but lacking the nutrients needed for optimal health.[62] It is also important to note that whole foods, especially fruits and vegetables, contain phytochemicals and antioxidants that protect against inflammation and oxidative stress.[63] When these foods are processed, many of these protective compounds are lost, reducing the health benefits of the food. For example, phenolic compounds in fruits, which have anti-inflammatory properties, are diminished during processing, weakening the food's overall nutritional profile.[64]

In addition to losing important nutrients and health properties, some methods of food processing have been shown to also create new compounds that may be harmful to health. For example, high-temperature cooking methods, such as frying and baking, can lead to the formation of acrylamides, particularly in starchy foods like potato chips and cereals.[65] Acrylamides are chemical compounds that have been linked to cancer in animal studies and

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Ultra-Processed People (2024) <https://www.penguin.co.uk/books/451300/ultra-processed-people-by-tulleken-chris-van/9781529160222> accessed 6 June 2024.

[59] Nathalie Judith Neumann, Gerrit Eichner and Mathias Fasshauer, 'Flavour, Emulsifiers and Colour Are the Most Frequent Markers to Detect Food Ultra-Processing in a UK Food Market Analysis' (2023) 26 Public Health Nutrition 3303.

[60] Anthony Fardet and Edmond Rock, 'Ultra-Processed Foods: A New Holistic Paradigm?' (2019) 93 Trends in Food Science & Technology 174.

[61] Luiza Antoniazzi and others, 'Ultra-Processed Food Consumption Deteriorates the Profile of Micronutrients Consumed by Portuguese Adults and Elderly: The UPPER Project' (2023) 62 European Journal of Nutrition 1131.

[62] Tulleken (n 58).

[63] Sareh Edalati and others, 'Higher Ultra-Processed Food Intake Is Associated with Higher DNA Damage in Healthy Adolescents' (2021) 125 British Journal of Nutrition 568.

[64] Tulleken (n 58).

[65] Dilini N Perera, Geeth G Hewavitharana and SB Navaratne, 'Comprehensive Study on the Acrylamide Content of High Thermally Processed Foods' (2021) 2021 BioMed Research International 6258508.

are suspected carcinogens in humans. They form when certain amino acids react with sugars at high temperatures, and their presence is common in foods like French fries, baked goods, and snacks—staples of the UPF market. Furthermore, the Maillard reaction, a chemical process that occurs during high-temperature cooking (e.g., frying and baking), produces advanced glycation end-products (AGEs) that can accumulate in the body.[66] AGEs have been shown to cause oxidative stress and inflammation, which contribute to conditions like diabetes and cardiovascular disease.[67] AGEs are harmful compounds formed when proteins or fats combine with sugar in high-heat environments. These are prevalent in many UPFs, especially those subjected to frying, grilling, or roasting.

Trans fats, which are created through hydrogenation to increase shelf life and improve texture, present another concern. Trans fats are linked to cardiovascular disease, as they raise low-density lipoprotein (LDL) cholesterol and lower high-density lipoprotein (HDL) cholesterol.[68] Although the EU has recently introduced limits on trans fats in food products (Regulation (EU) 2019/649), trans fats and similarly harmful modified fats remain present in many UPFs, such as fried snacks, margarine, and baked goods, which continue to pose cumulative dietary risks when consumed regularly.

In each of these examples, the health risks do not stem from contamination or spoilage but from the structural and nutritional changes caused by extensive processing itself. Since EU food safety regulations focus on acute contamination-related hazards, these long-term effects of food processing on health remain unaddressed. This gap allows UPFs, even those high in HFCS, trans fats, and AGEs, to be marketed as "safe" despite mounting evidence linking them to significant health issues over time.

3.3. The Cocktail Effect of Additives

A further limitation of the EU's food safety framework lies in its approach to food additives, which are regulated individually without consideration for their combined effects, what could be described as the 'cocktail effect'. Under the Food Additives Regulation (EC 1333/2008), the European Food Safety Authority is responsible for evaluating the safety of food additives. Each additive undergoes testing to establish an Acceptable Daily Intake (ADI)

[66] Yang Liu and others, 'Formation of Advanced Glycation End-Products and α-Dicarbonyl Compounds through Maillard Reaction: Solutions from Natural Polyphenols' (2023) 120 Journal of Food Composition and Analysis 105350.
[67] E Schleicher and U Friess, 'Oxidative Stress, AGE, and Atherosclerosis' (2007) 72 Kidney International S17.
[68] Md Ashraful Islam and others, 'Trans Fatty Acids and Lipid Profile: A Serious Risk Factor to Cardiovascular Disease, Cancer and Diabetes' (2019) 13 Diabetes & Metabolic Syndrome: Clinical Research & Reviews 1643.

level based on toxicological studies that assess the additive's safety. These studies aim to identify the highest dose of an additive that can be consumed daily without toxic effects, typically by conducting animal feeding experiments that examine impacts on various organs and potential for carcinogenicity, reproductive toxicity, and allergic reactions. Once the ADI is scientifically determined, it is assumed that occasional consumption above this level will not harm health due to a built-in 100-fold safety margin. However, the framework's reliance on these toxicological studies—and its lack of clinical trials or assessments of long-term, cumulative effects—limits its capacity to fully address the risks posed by regular, combined additive consumption, particularly in diets high in UPFs.

UPFs often contain a variety of additives, such as artificial sweeteners, emulsifiers, and preservatives, that help enhance taste, texture, and shelf life. Studies have shown that when these additives are ingested in combination, they may interact within the body in ways that could compound or even amplify health risks.[69] The current EU framework does not mandate testing for the combined effects of multiple additives consumed together, even though such combinations are typical in UPFs and may contribute to adverse health outcomes in ways that individual ADIs cannot capture.[70] In other words, while the EU's current regulatory framework on food additives evaluates the cumulative toxicity of a specific additive over time and prohibits its use if long-term harmful effects are identified, it does not account for the potential health risks arising from the combined, long-term consumption of multiple additives used in tandem. This gap in assessment means that while individual additives may be deemed safe in isolation, their collective impact—especially in diets high in UPFs—remains largely unexamined.

This oversight creates a significant gap in the regulatory framework, as this means that regular UPF consumption may expose consumers to risks that are invisible within the current regulatory paradigm, potentially affecting gut health, metabolic regulation, and inflammatory responses. Additionally, neither the General Food Law (GFL) nor the EU's food information regulations require manufacturers to disclose the specific quantities of additives in their products. This lack of transparency makes it impossible for consumers to track how much of each additive they consume or to manage their exposure effectively. Current nutritional

[69] Pilar Abiega-Franyutti and Veronica Freyre-Fonseca, 'Chronic Consumption of Food-Additives Lead to Changes via Microbiota Gut-Brain Axis' (2021) 464 Toxicology 153001; Eloi Chazelas and others, 'Exposure to Food Additive Mixtures in 106,000 French Adults from the NutriNet-Santé Cohort' (2021) 11 Scientific Reports 19680; Saseendran Sambu and others, 'Toxicological and Teratogenic Effect of Various Food Additives: An Updated Review' (2022) 2022 BioMed Research International 6829409.
[70] Chazelas and others (n 69).

epidemiology and emerging research on gut microbiome health indicate that such long-term, combined exposure to additives may affect human health in ways that traditional toxicological testing does not address.[71] For instance, the cumulative effect of additives on gut microbiome diversity and function—a field rapidly advancing due to the recognised importance of gut health for overall well-being—remains largely unexplored in the regulatory framework.[72]

4. EU's Food Information and Consumer Empowerment Paradigm

The three limitations examined above do not mean that EU food law entirely neglects the regulation of the slow harm associated with UPF markets. Rather, EU food law addresses slow harm by placing the responsibility primarily on consumers, relying on mechanisms such as food labelling, health claims, and marketing regulations to empower individuals to manage these risks themselves. The EU's reliance on consumer empowerment and transparency places the responsibility for managing long-term health risks from UPFs largely on individuals, through what is known as the 'consumer choice' paradigm. The EU's regulatory model assumes that with adequate information, consumers can make informed dietary decisions to protect their health. Key regulations, such as the Food Information to Consumers (FIC) Regulation (EU 1169/2011) and the Nutrition and Health Claims Regulation (EC 1924/2006), mandate that food products must provide clear labelling, including nutritional and ingredient information. These regulations aim to empower consumers to make health-conscious choices by giving them the knowledge to navigate potential dietary risks.

However, critics of the informational model argue that while clear labelling is an important aspect of consumer protection, it assumes that all consumers are equally able to interpret nutritional information and to navigate complex health risks, an assumption, as I discuss below, that does not hold in practice. Moreover, the rapid global expansion of UPF markets over the past decade has driven a shift towards more interventionist food policies, moving beyond mere information-based regulation of food consumption.

In 2023, the global UPF market reached an estimated value of approximately 2 trillion of Euros, with forecasts indicating a growth rate of 9% by 2028.[73] This rapid expansion

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[71] Tim Newman and Tim Spector, 'Food Flavorings: Natural, Artificial, and Health Effects' (2024) <https://zoe.com/learn/food-flavorings-safety> accessed 21 June 2024.

[72] ibid; Mathilde Touvier, 'The Health Impact of Food Additives' (*E R,C* 31 January 2024) <https://erc.europa.eu/projects-statistics/science-stories/health-impact-food-additives> accessed 16 July 2024.

[73] Technavio, 'Ultra Processed Food Market Size Growth Trends Report 2024-2028' (2023) <https://www.technavio.com/report/ultra-processed-food-market-industry-analysis> accessed 19 July 2024.

evidences the growing integration of UPFs into diets worldwide, especially in high-consumption countries like the United Kingdom and the United States. Here, there is a noticeable shift away from traditional diets toward highly processed, industrially produced foods.[74] Such trends reflect deeper socioeconomic shifts and pose significant public health challenges. The World Health Organization (WHO) has documented a particularly sharp rise in UPF consumption among children and in regions where food cultures have historically been diverse and locally sourced, such as the European Union (EU) and the Global South. This shift from traditional to industrial diets in these areas has sparked intense debate over cultural, health, and environmental impacts.[75]

In response to mounting evidence of the health risks posed by UPFs, various countries have begun implementing regulatory measures to curb their consumption. For example, Brazil and Mexico have restricted the sale of UPFs in certain school districts to protect children's diets.[76] In Latin America, several countries, including Mexico, Ecuador, Chile, Peru, Uruguay, Argentina, and Colombia, have mandated black octagon warning labels on UPFs to inform consumers about health risks.[77] Additionally, over 45 countries have introduced taxes on ultra-processed beverages, with others considering similar fiscal policies to reduce UPF consumption.[78] These measures highlight an emerging global trend in public health policy, wherein governments seek to mitigate the adverse health effects of UPFs through regulatory interventions.

Critics of the EU's information-centred approach argue that it inadequately addresses the pervasive marketing and accessibility of UPFs, which make these foods highly convenient

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[74] Mirko Marino and others, 'A Systematic Review of Worldwide Consumption of Ultra-Processed Foods: Findings and Criticisms' (2021) 13 Nutrients 2778.

[75] Elizabeth Dunford and Barry Popkin, 'Ultra-Processed Food for Infants and Toddlers; Dynamics of Supply and Demand' (2023) 101 Bulletin of the World Health Organization 358; World Health Organization and Unicef, 'Protecting Children from the Harmful Impact of the Food Marketing: Policy Brief' (2022) <https://iris.who.int/rest/bitstreams/1426078/retrieve> accessed 2 June 2024.

[76] Desiderata Institute, 'Rio de Janeiro on the road to healthier schools' (*Desiderata*, 21 July 2023) <https://desiderata.org.br/rio-de-janeiro-on-the-road-to-healthier-schools/> accessed 6 June 2024; Laura Reiley, 'Mexico Moves to Ban Junk Food Sales to Children, Citing Obesity as Coronavirus Risk Factor' *The Seattle Times* (2022) <https://www.seattletimes.com/nation-world/mexico-moves-to-ban-junk-food-sales-to-children-citing-obesity-as-coronavirus-risk-factor/> accessed 6 June 2024; The Global Health Advocacy Incubator, 'Breaking the Cycle of Unhealthy Eating: Rio de Janeiro Newest…' (*Global Health Advocacy Incubator*, 2023) <https://www.advocacyincubator.org/news/2023-08-09-breaking-the-cycle-of-unhealthy-eating-rio-de-janeiro-newest-brazilian-city-to-ban-ultra-processed-products-in-schools> accessed 6 June 2024.

[77] Chen Chen, 'A Look at Food Warning Labels in Mexico | Think Global Health' (*Council on Foreign*, 13 January 2023) <https://www.thinkglobalhealth.org/article/look-food-warning-labels-mexico> accessed 6 June 2024; Cecilia Nowell, 'Latin America Labels Ultra-Processed Foods. Will the US Follow?' *The Guardian* (21 May 2024) <https://www.theguardian.com/environment/article/2024/may/21/latin-america-food-labels-processed-foods> accessed 6 June 2024.

[78] Barry M Popkin and others, 'Toward Unified and Impactful Policies for Reducing Ultraprocessed Food Consumption and Promoting Healthier Eating Globally' (2021) 9 The lancet. Diabetes & endocrinology 462.

and appealing, particularly for lower-income consumers.[79] Furthermore, this framework neglects broader social determinants of health that shape dietary behaviour, particularly among marginalised populations who may lack access to healthier alternatives. By emphasising individual responsibility while failing to address structural barriers to healthy eating, the EU's regulatory model risks marginalising vulnerable consumers and overlooking the systemic influences that drive UPF consumption.[80]

The consumption of UPFs in Europe is not simply a matter of individual choice but is deeply influenced by structural inequalities, as demonstrated by research across sociology, public health, and geography. These fields consistently show that food choices are intertwined with socioeconomic, environmental, and political factors, disproportionately impacting low-income and marginalised groups.[81] For example, a large-scale study across 32 countries, including EU member states, found that UPF consumption is particularly high among children, young adults, and lower socioeconomic groups, suggesting a normalization of UPFs within certain demographics. This pattern is exacerbated in urban settings, where reliance on readily available and affordable UPFs is more pronounced due to urban lifestyle demands.[82] This evidence demonstrates that UPF consumption is largely driven by factors such as income inequality, urbanization, and lifestyle constraints rather than mere consumer preference.

Economic pressures further push low-income families toward calorie-dense, inexpensive UPFs, which meet immediate dietary needs while remaining affordable. In the UK, for instance, adherence to national dietary guidelines is financially unfeasible for many low-

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[79] Oliver Bartlett and Amandine Garde, 'Time to Seize the (Red) Bull by the Horns: The EU's Failure to Protect Children from Alcohol and Unhealthy Food Marketing' (2013) 38 European Law Review <https://durham-repository.worktribe.com/output/1469214> accessed 7 August 2024; Anna Galmiche, Felix Delerm and Melanie Levy, 'Healthwashing: Corporate Communication Strategies in a Legal Gray Zone' (2023) 36 Loyola Consumer Law Review 23; A Garde, 'Food Advertising and Obesity Prevention: What Role for the European Union?' (2008) 31 Journal of Consumer Policy <https://durham-repository.worktribe.com/output/1548090/food-advertising-and-obesity-prevention-what-role-for-the-european-union> accessed 7 August 2024; Elizabeth Handsley and Belinda Reeve, 'Holding Food Companies Responsible for Unhealthy Food Marketing to Children: Can International Human Rights Instruments Provide a New Approach?' (2020) 41 UNIVERSITY OF NEW SOUTH WALES LAW JOURNAL 449; Y Ngqangashe and others, 'How Policy Actors Assert Authority in the Governance of Food Marketing Policies' (2022) 110 Food Policy 102297.

[80] Maria EL Gemayel, 'Food Quality in the European Union: Does the Consumer Have Free Choice?' (2022) 13 European Journal of Risk Regulation 236; Gokani (n 7).

[81] DJ Bakker, 'Consumer Behaviour and Attitudes towards Low-Calorie Products in Europe' (1999) 85 World Review of Nutrition and Dietetics 146; Carolyn de la Peña, 'Artificial Sweetener as a Historical Window to Culturally Situated Health' (2010) 1190 Annals of the New York Academy of Sciences 159; Priya Fielding-Singh and Merin Oleschuk, 'Unequal Foodwork: Situating the Sociology of Feeding within Diet and Nutrition Disparities' (2023) 17 Sociology Compass e13067; Amy Trauger, 'Geographies of Food and Power' (*Routledge & CRC Press*, 2022) <https://www.routledge.com/Geographies-of-Food-and-Power/Trauger/p/book/9780367747664> accessed 21 August 2024.

[82] Samuel J Dicken, Sulmaaz Qamar and Rachel L Batterham, 'Who Consumes Ultra-Processed Food? A Systematic Review of Sociodemographic Determinants of Ultra-Processed Food Consumption from Nationally Representative Samples' [2023] Nutrition Research Reviews 1.

income households, which would need to spend over half their budget to meet recommended standards, effectively locking them into reliance on UPFs like snack bars, sugary yogurts, and processed cereals.[83] Similar findings have emerged from Italy and Spain, where economic inequality limits access to fresh foods.[84] These affordability issues are exacerbated by physical barriers in 'food deserts'.[85] Over a million UK residents live in such areas, where fresh produce is scarce, and convenience stores with UPF-heavy inventories are the primary food sources.[86] Research from Belgium, Spain, and Poland similarly indicates that food deserts are a growing concern across the EU, complicating access to healthy options in low-income neighbourhoods.[87]

Structural reliance on UPFs is also reinforced by limited household resources and infrastructure. Studies indicate that nearly one million UK residents lack essential kitchen appliances like stoves or refrigerators, while rising energy costs further hinder the affordability of cooking fresh meals.[88] Such constraints are particularly prevalent in low-income, single-parent households and those with unemployed members, where the convenience and shelf-stability of UPFs are often critical due to limited time and resources.[89] This pattern reveals that structural constraints, not just individual choices, shape high UPF consumption among disadvantaged demographics.

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[83] Rebecca Tobi and others, 'The Broken Plate 2023' (2023) <https://foodfoundation.org.uk/sites/default/files/2023-10/TFF_The%20Broken%20Plate%202023_Digital_FINAL..pdf> accessed 10 September 2024.

[84] Irazu Yanaina Chavez-Ugalde and others, 'Ultra-Processed Food Consumption in UK Adolescents: Distribution, Trends, and Sociodemographic Correlates Using the National Diet and Nutrition Survey 2008/09 to 2018/19' [2024] European Journal of Nutrition <https://doi.org/10.1007/s00394-024-03458-z> accessed 19 July 2024.

[85] Crowe, Lacy and Columbus (n 37); Hillary J Shaw, 'Food Deserts: Towards the Development of a Classification' (2006) 88 Geografiska Annaler: Series B, Human Geography 231.

[86] Megan Blake, '1.2 Million Living in UK Food Deserts, Studys Shows' (16 October 2018) <https://www.sheffield.ac.uk/social-sciences/news/12-million-living-uk-food-deserts-studys-shows> accessed 16 July 2024.

[87] Kristína Bilková and others, 'Sciendo' (2017) 25 Moravian Geographical Reports 95; Irena Guszak Cerovečki and Marko Grünhagen, '"Food Deserts" in Urban Districts: Evidence from a Transitional Market and Implications for Macromarketing' (2016) 36 Journal of Macromarketing 337; Marco Helbich and others, 'Food Deserts? Healthy Food Access in Amsterdam' (2017) 83 Applied Geography 1; František Križan and others, 'Potential Food Deserts and Food Oases in a Post-Communist City: Access, Quality, Variability and Price of Food in Bratislava-Petržalka' (2015) 62 Applied Geography 8; Vincent Smets, Jeroen Cant and Stefanie Vandevijvere, 'The Changing Landscape of Food Deserts and Swamps over More than a Decade in Flanders, Belgium' (2022) 19 International Journal of Environmental Research and Public Health 13854.

[88] C Gallagher-Squires and others, 'Snacking Practices from Infancy to Adolescence: Parental Perspectives from Longitudinal Lived Experience Research in England' [2023] Proceedings of the Nutrition Society 1.

[89] Neha Khandpur and others, 'Ultra-Processed Food Consumption among the Paediatric Population: An Overview and Call to Action from the European Childhood Obesity Group' (2020) 76 Annals of Nutrition & Metabolism 109.

Behavioural studies reinforce that convenience, affordability, and taste are often the main drivers behind UPF consumption, even for those aware of the associated health risks.[90] Individuals facing high demands on their time, such as single parents or those working multiple jobs, often find UPFs to be a practical solution, highlighting structural issues around work-life balance that contribute to unhealthy dietary patterns. The availability of inexpensive, hyper-palatable UPFs that require minimal preparation becomes especially appealing in urban, working-class contexts, emphasising the socioeconomic drivers of dietary choices.

Children and adolescents are particularly vulnerable to structural drivers of UPF consumption, as these foods are engineered to be hyper-palatable through added sugar, salt, and fats. Studies by Gearhardt et al.[91] and LaFata et al.[92] have highlighted the addictive qualities of UPFs, which can stimulate dopamine release, potentially leading to habitual overconsumption. Marketing practices targeting children and the accessibility of UPFs in schools and recreational environments amplify these risks, embedding unhealthy dietary habits early on. Longitudinal research suggests that children who consume high levels of UPFs are likely to continue these habits into adulthood, raising their risk for chronic conditions such as obesity, type 2 diabetes, and cardiovascular disease.[93]

These consumption patterns have profound implications for EU food policy. While current regulations emphasise consumer autonomy and informed choice, largely relying on labelling and nutritional information to promote healthier eating, this approach does not adequately address the structural inequalities that limit dietary options. Studies indicate that informational interventions alone cannot significantly reduce health risks if socioeconomic barriers prevent access to healthier food.[94] Consequently, a growing consensus among researchers advocates for a regulatory framework that considers structural factors and systemic inequalities in addressing diet-related health disparities effectively.[95] This approach would move beyond individual responsibility, acknowledging the need for structural changes that enable all demographics to access healthier food options.

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[90] EIT Food Consumer Observatory, 'Consumer Perceptions Unwrapped: Ultra-Processed Food (UPF)' (2024) <https://www.eitfood.eu/files/Consumer-Perceptions-Unwrapped_Consumer-Observatory-Report-1.pdf> accessed 1 August 2024.

[91] 'Social, Clinical, and Policy Implications of Ultra-Processed Food Addiction' [2023] BMJ e075354.

[92] 'Ultra-Processed Food Addiction: A Research Update' (2024) 13 Current Obesity Reports 214.

[93] Ramona De Amicis and others, 'Ultra-Processed Foods and Obesity and Adiposity Parameters among Children and Adolescents: A Systematic Review' (2022) 61 European Journal of Nutrition 2297.

[94] Mireya Vilar-Compte and others, 'Urban Poverty and Nutrition Challenges Associated with Accessibility to a Healthy Diet: A Global Systematic Literature Review' (2021) 20 International Journal for Equity in Health 40.

[95] Tanya Agurs-Collins and others, 'Perspective: Nutrition Health Disparities Framework: A Model to Advance Health Equity' (2024) 15 Advances in Nutrition 100194; Nicholas Nisbett and others, 'Holding No-One Back: The Nutrition Equity Framework in Theory and Practice' (2022) 32 Global Food Security 100605.

5. Conclusion

This article makes a significant contribution to existing legal scholarship by arguing that the European Union's food safety paradigm must be reimagined to include the concept of slow harm. While EU food law currently protects consumers from immediate and long-term measurable food hazards—biological, chemical, and physical—it fails to account for the cumulative harm associated with UPFs. This cumulative harm extends beyond toxic accumulation to include three interrelated but overlooked risks: (a) the cocktail effect of food additives, where multiple permitted additives interact in unknown ways; (b) cross-sectoral harm, where different food providers collectively shape unhealthy consumption patterns across the food marketplace; and (c) harm from industrial food processing, which depletes nutritional value and introduces harmful by-products. Together, these risks contribute to chronic health conditions that, rather than being directly addressed by EU food safety law, are largely shifted onto consumers, who are expected to navigate and mitigate these risks individually.

Reframing EU food law to incorporate slow harm would require substantial regulatory shifts, particularly in how food safety is assessed and enforced. A key recommendation is for the EFSA to expand its safety assessments beyond isolated chemical risks. EFSA's current approach to cumulative toxicity is limited and does not, for example, evaluate the combined, long-term effects of multiple food additives consumed together in a UPF-heavy diet. Future assessments should include research on additive synergy and gut microbiome health, which could reveal interactions between emulsifiers, preservatives, artificial sweeteners, and stabilisers that amplify long-term risks.

Moreover, EFSA's risk assessment process should move beyond its current product-focused approach to adopt a population-wide perspective on consumption patterns. Chronic harm from UPFs is not evenly distributed among consumers—low-income and marginalised groups disproportionately rely on UPFs due to cost, accessibility, and aggressive marketing. The regulatory framework should therefore incorporate demographic and epidemiological data to assess which consumer groups are at greatest risk and adjust food safety standards accordingly.

In addition to strengthening risk assessments, EU food policy must move beyond its reliance on consumer labelling as the primary regulatory tool. While front-of-pack labelling plays an important role, existing nutrition labels fail to capture the risks unique to UPFs. Mandatory warnings should be introduced for UPFs, similar to policies adopted in Latin

American countries like Chile and Mexico, where UPFs are required to display high-visibility warnings when they exceed critical thresholds for additives, processing levels, or other risk factors. These warnings recognise that macronutrient information alone is insufficient to protect consumers from the unique harms of UPFs, which go beyond sugar and fat content to include industrial processing and additive exposure.

Importantly, this article suggests that the EU's food safety paradigm, built to manage acute food hazards, is outdated in the context of modern food markets dominated by UPFs. As scientific evidence increasingly links UPF consumption to metabolic disorders, cardiovascular disease, and early mortality, EU law must evolve to recognise slow harm as a legitimate food safety concern. This would mark a significant shift in EU regulatory thinking, ensuring that food safety law is not just about preventing immediate dangers but also mitigating the long-term, cumulative risks that threaten public health. By embedding a slow harm perspective into EU food law, policymakers can create a more protective, equitable, and forward-looking regulatory framework that better reflects the realities of modern (industrial) food consumption.

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