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**CRITICALLY REVIEW CONFLICTS BETWEEN COMMERCIAL
INTEREST AND PUBLIC HEALTH**

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“Adulteration had ‘risen almost to the dignity of exact science - certain large companies trade almost entirely in “faked” products and are able to employ the highest legal talent to drive the proverbial coach and horses through the Food and Drugs Act, and can even influence Parliament itself”

(Collins, 1993)

Abstract

Objective - The aim of the study is to find out whether fundamental changes to public health policy are necessary to reduce the negative influence of commercial ultra-processed food (UPF). Use of xenobiotics, development of food processing technologies including strategies to promote sales, has enabled food corporations to become profitable, wealthy and powerful. The extent of corporate power has changed evolutionary dietary patterns.

With ultra-processed food defining the diets of many industrialised nations, concerns relating to adverse health harms including non-communicable disease are well evidenced. The Commercial Determinants of Health (CDoH), a relatively new public health focus, provides opportunity to monitor and analyse negatively impactful corporate activity, in turn, informing potentially necessary policy to reduce the harms.

Method – To fulfil the research objectives, the literature review critically discussed the conflicts between commercial interests and public health. Through concisely synthesised relevant subtopics, including an historical element of the evolution of UPF, the reader, through synthesis and analysis of qualitative data, statistical and illustrative content, is informed of the harms of industrialised UPF.

Results – The results of the study found that UPF and UPF environments are ubiquitous, deliberately created to enhance commercial sales and generate profit for large transnational corporations. Despite evidence demonstrating that UPF is a significant risk factor for dietary ill health, non-communicable disease and health inequities, rates continue to rise. Urgent intervention is needed to reduce corporate power and the harms caused by UPF consumption. With corporate power able to obstruct and influence government policy making, effecting policy is challenging. Current policy measures are inadequate and public health is undermined. There are many ways in which coordinated action could reduce impacts of commercial interests and recommendations are included.

Conclusion - Fundamental changes to public health policy are urgently required to reduce the negative influence of commercial interests within the ultra-processed food industry.

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Abbreviations

CDoH	Commercial Determinants of Health
NCD's	Non Communicable Diseases
SDIL	Soft Drinks Industry Levy
UPF	Ultra-Processed Food (which includes non-alcoholic beverages)

Introduction

Previously un-encountered in hominin diets, industrial manufacturers and chemical companies introduced xenobiotics into the hominin food chain. Experimental and unregulated, food was often toxic. Through powerful allegiances driven by capitalist ideology, industrial food manufacturers chemically reformulated food and began replacing expensive pure food. Marketed as convenient and safe, cheap synthetic food gradually replaced traditional evolutionary diets.

During the latter part of the 20th century, trade liberalisation and the deployment of powerful advanced capitalist strategies enhanced the rapid development of UPF and UPF outlets in which sales of UPF increased exponentially. With little to prevent industrial momentum, food manufacturers transitioned into a global corporate powerhouse. Since the late 1970's, consumption of UPF has grown exponentially as have corporate profits which have provided corporations with considerable wealth, resource and power.

With diets of many high and increasingly low and middle income countries comprising mainly of UPF, evolutionary dietary patterns are largely being eradicated. UPF contains very little beneficial macro and micronutrients and many harmful xenobiotics, and high levels of salt, sugar and trans fats. Termed evolutionary discordance, rapid changes to evolutionary diets have resulted in profound disturbances to the human genome and metabolic function. With evidence confirming links between UPF consumption and adverse health harms including non-communicable diseases (NCD's), co-morbidities and mortality, the threat to global health is severe.

The UPF industry is one of four global industries that target vulnerable populations, fuel chronic disease and obstruct health policies to protect profits. UPF's are created by for profit corporations. The Commercial Determinants of Health (CDoH) lens provides an opportunity for public health interests to monitor and analyse, in this case, negative corporate activities. From analysis, design and development of policy, impactful interventions could considerably reduce both corporate power and the health harms they cause. With corporations able to influence and control the policy decision process, implementation presents considerable challenges to public health interests.

The aim of this study is to find out whether fundamental changes to public health policy are necessary to reduce the negative influence of commercial interests within the ultra-

processed food industry. The study reviews the conflicts between policy makers and commercial entities and critically reviews the challenges that public health professionals face in reducing the influence and impacts of commercial health harms.

By utilising secondary data, the following research objectives will be addressed -

Research Objectives –

- Critically examine the current landscape for ultra-processed foods and the potential commercial advantages of selling products which are detrimental to health
- Critically review the Commercial Determinants of Health (CDoH) discussing the history, evolving definition, and its relevance to non-communicable disease and wider impacts/influence to public health
- Critically examine current research assessing the challenges in relation to creating effective policy
- Explore ways in which coordinated action could reduce impacts of commercial interests and make recommendations for change in order to improve public health outcomes

Methodology

The philosophical underpinnings of the following research methodology derive from a critical paradigm, challenging current injustice and advocating emancipation and social interest by arguing for reduction from current negative commercial dominance of the food industry to improve public health. The ontological ('pertaining to what exists') and epistemological assumptions ('nature, limitations and justification of human knowledge') Hathcoat *et al*, (2019) which form the basis of this research refer to existing theory – that through strategies and approach, commercial actors who promote their products, knowingly influencing consumer choice are consequentially driving escalating avoidable levels of ill health, non-communicable disease, health inequities, environmental degradation and planetary damage, Maani *et al*, (2023).

The Commercial Determinants of Health (CDoH) lens, (a relatively new public health focus) refers to conditions, actions and omissions by commercial actors that affect health, Maani *et al*, (2023). Conglomerates of globalised UPF (UPF, the commercial example selected for research), through powerful influential strategies, for example scientific objectivity in respect of claims to public health benefits (research bias) and aggressive marketing of cheap, convenient, highly palatable UPF, not only has displaced evolutionary dietary patterns but is a substantial driver of health harms, non-communicable diseases (NCD's) and erosion of health equity. Formidable, domineering and unaccountable systems of power, conglomerates exert political leveraging, lobbying and influence over international agreements and regulations thus possessing *de facto* dominance. Through exploitative action, public health is undermined, Provost, (2023), Maani, (2023).

The critical philosophical perspective considers that qualitative research best informs the research question –

Is fundamental change to public health policy necessary to reduce the negative influence of commercial interests within the ultra-processed food industry?

To fulfil the research objectives, the literature review concisely and critically synthesises relevant subtopics including a historical element to inform the research of the origins of UPF and CDoH.

Deductive and logical reasoning, interpretation of existing evidence, analysis of concepts, evaluation of discussions and objectives, consideration of arguments from both commercial, industry and public health perspectives were carefully considered for their value, quality and originality in supporting the literature review. Additionally, techniques, for example, descriptive statistics and language orientated data, analytical content (graphs and statistics) were utilised to support arguments for evidence (Hammersley, 2013).

Primary research, although fundamental, was not considered appropriate for this research design. Complex and multi factorial, no single research study could have answered the research question and, if implemented would have limited the research and its conclusive element. Therefore, secondary data/desk based research was considered appropriate and included –

- Robust (current and historic) scientific (electronic open access) publications/academic journals
- Documentary data
- Published reports
- Books
- Government Documents including Public Health Documents
- Industry commentary/research
- Illustrated sources for example advertising of UPF
- Information from non-governmental organisations (NGO's) for example, Sustain Alliance, The Food Foundation, British Nutrition Foundation
- Presentations
- Recorded meetings/podcasts
- Reports by professional and industry bodies, articles and blogs

The advantages of using multiple sources therefore perspectives are that they provided crucial depth of understanding both from evolutionary perspectives right up to current circumstances – a complex topic, this was critical in fulfilling the research objectives, to

inform policy recommendations and support improvements towards public health including supporting credibility and contributing to originality.

Statistical evidence and comparative work was critical in supporting evidence, for example, to discuss correlations between consumption, health harms and increased NCD's (obesity/diabetes/mental health). Access to free webinars and scientific publications via You Tube and LinkedIn proved excellent and valuable resources. Other advantages of using secondary data include economy and time saving, The Open University, (2023) Hammersley, (2013).

Inevitable limitations within this research included practical, geographical and time constraints, for example, interviews with scientific experts, industry representatives and policy makers would have advantageously improved understanding within complex areas, for example, government policy and regulatory legislation but for many reasons could not be considered an option.

Valuable research sources emerged during the writing of this dissertation, for example - *The House of Lords Committee on Food, Diet and Obesity and its call for written evidence for its enquiry into the roles of foods for example UPF and foods high in fat, sugar and salt in tackling obesity*, UK Parliament Committees, (2024) where a broad range of scientists and NGO representatives presented evidence in respect of UPF harming populations and need for greater policy.

Given that the Commercial Determinates of Health is such a relatively new focus within scientific research, initially there were concerns regarding availability of information but as the research unfolded, this wasn't considered a limiting factor.

In selecting appropriate references, careful consideration was necessary with regard to research published by the food industry. Notorious for its research bias, publications selected were either used to provide examples of research bias or if not for that purpose, were carefully considered before use.

Key words and acronyms used in the research are defined, for example, CDoH (Commercial Determinants of Health).

Due to practicality issues and time constraints, the time horizon presents cross sectional analyses of the current situation with time scale for completion limited to one year.

Literature Review

Chapter 1 - Food Processing, Historical Overview

Utilisation of natural processes to improve and extend the life of food and beverages has existed since the dawn of humanity. Throughout centuries and civilisations, elementary methods and techniques, although laborious and energy intensive (*drying, smoking, heating, salting, freezing, pickling, steaming, fermenting, threshing, grinding, malting, sifting, pressing, churning, curdling, distilling, chopping, slicing (biting and chewing)*), have aided inhibition of bacterial and fungal growth, so as to preserve food, extend its shelf life, rendering its suitability to consume, cook and/or store. Humanity's extraordinary ability to survive has depended upon its ability to process and preserve food. It is the bedrock upon which civilisation is founded, Lymbery, (2023).

Surprisingly, modification of food by inclusion of chemicals shares an equally long history but their prolificacy of use did not fully emerge until inception of modern science.

Literature refers to this period during late 17th century when Robert Boyles landmark, influential discoveries, publications and works to eliminate food additives in food preservation, transitioned alchemy to mainstream chemistry, Science Museum Group, (2019), up until then production, processing and preservation remained minimal, sustainable, comprising wild plant and animal food Olstad *et al*, (2023).

The Agricultural Revolution, the rise of Industrialisation and the rapid advancement in the chemistry of food preservation (post 1830) constituted radical social, political and environmental change, Rowe, (1998).

One considerable change involved the introduction of xenobiotics into the hominin food chain '*foreign chemical substances to which an organism is exposed that are extrinsic to the normal metabolism of that organism*' Croom, (2012).

Through industrial food processing, manufacturing and agriculture, novel synthetic additives including benzoate preservatives, enzymes, colorants, dyes and flavourings began transforming food production. Hailed as revolutionary, exciting and dynamic, their effects on food included –

- *Inhibition of micro-nutrient spoilage (and related disease)*
- *Enhancement/modification of flavour, taste and texture*
- *Improved preservation and shelf stability*
- *Cosmetic/organoleptic enhancement*
- *Replacement/substitution of wholefood (for example, synthetisation of fatty acids in production of margarine /chemical oxidation in production of saccharin)*
- *Increased yields/increased ripening times (monocrop culture), economic durability*

Source, Blum, (2018)

Previously un-encountered in hominin diets, the scope and speed whereby developing food technologies could transform food affected not only permanent change to food but implications which would extend far beyond the industrial period.

1.1 - Socio-Economic Environment

A unique element within hominin evolutionary development is the formation of socio-economic environments Shultz, (2022). Humans are traders and reliance on trading food through reciprocal interaction has throughout millennia facilitated health, wellbeing, security and progression of civilisation. A problem within this development, however, is individual self-interest which has impacted on the nature of and the utilisation of food as a profitable mechanism for fraud. For example, Blum, (2018) refers to ‘Garblers’ – tradespeople, who during thirteenth-century England were employed to inspect imported spices to sift out grain and grit and who, depending on their employer, enhanced the product or facilitated its demise by adding ground alternative ingredients for example, twigs and sand.

Disdainful and destructive aspects of human nature paved the direction towards emergence of the contentious economic and social system known as capitalism.

“Capitalism an economic system founded on colonial looting. It operates on a consistently shifting and self-consuming frontier, on which both state and powerful private interests use their own laws, backed by the threat of violence, to turn shared resources into exclusive property, and to transform natural wealth, labour and money into commodities that can be accumulated”

Monbiot, (2024)

With origins closely aligned to the enclosure of the commons, colonialization, subjugated dominance, slave plantations, agricultural and industrial revolution, Maani *et al*, (2023), capitalism incentivised opportunity for food exploitation, resulting in full industrialisation of the food system. Regarded by many as a mechanism for societal improvement, (for example by the alleviation of poverty, disease and malnutrition through improved sanitation, public health, infrastructure, food supply, employment, workers' rights, personal and political freedoms) capitalism has been accompanied by ongoing criticism that has emphasized more disadvantages than advantages, Johannes, (2021), for example –

- *Segregation of socioeconomic classes*
- *Disproportionate amounts of wealth*
- *Unequal distribution and rewards of economic growth*
- *Mass production of goods sold and consumed (often surplus to need)*
- *Social inequalities*
- *Food inequities*
- *Poor health*
- *Non-communicable disease and environmental degradation*

Whilst it may be deemed appropriate to consider that not all motivational drivers remained exclusively limited to profiteering, for most industrial food manufacturers this was almost certainly the case, indeed many 19th century companies embroiled in self-protecting legal battles are today's front runners. Capitalism's fundamental relationship to food involved its realignment and repurposing for example, the liberal application of cheaply available chemicals to food. Once a sustainable and life giving source, food quality became inferior and a commodity to be bought and sold for the sole purpose of generating profit, Dimpleby, (2023), Monterio *et al*, (2019), Van Tulleken, (2023).

1.2 - Industrialisation of the Food Industry

In the absence of government legislation, regulation and sufficient scientific data supporting xenobiotic provision for human consumption, including insufficient scientific ability to detect and quantify chemical presence or prove causal links between clinical symptoms and specific food items, industry embraced cheap cost cutting or experimental substitutes, the use of which became rampant. The 19th and early 20th century is referred to by Blum, (2018) as the golden age of adulteration. Unquantified, unregulated, untested

levels of chemicals in food resulted in infamous toxicity, sickness, poison epidemics and death.

Figure 1.3 - Food Adulteration



Source: Costa, (2012)

The development of self-protecting infrastructure and the façade ‘enterprising innovation’ became the food industries way of continuing its profit making trajectory.

With few able to challenge its newly acquired power, protecting public health became an onerous task. This new industry –

- *Showed determination, animosity, hostility, aggression, dishonesty and deceptiveness*
- *Engaged in - corruption, unethical/immoral decision making, fraudulence, aggressive marketing, manipulation, competitiveness, coerciveness, false labelling of food, false claims, purported health benefits (for example, advantageous claims proclaiming fat and sugar replacers were healthier alternatives) and government lobbying*

Source: Blum, (2018)

Corrupt governmental officials blocked publications of ‘industry unfriendly findings,’ delayed or overturned proposed public health interventions, made claims arguing authenticity, quashed scientific research and disregarded proposed precautionary chemical

limits. With the creation of industry allied and lobbying groups including intellectual property, determination took on an entirely new meaning.

1.4 - Government Legislation – Food and Drugs Act 1906

Throughout 19th century America, food adulteration and use of harmful ingredients was not an illegal activity. With the passing of The Federal Meat Inspection Act and The Pure Food and Drug Act 1906, (and later The Food and Drugs Administration 1927) (Blum, (2018), strict regulatory enforcement reduced adulteration, substitution and mislabelling and brought about improvements to public health. The Pure Food and Drug Act, for example, required accurate labelling and prohibited the sale of adulterated and misbranded food.

Whilst landmark, the critical issue henceforth emerged in respect of industrial action and its transition from illicit to authorized forms of adulteration. Industries persistent and intense political and social leveraging resulted in ‘legal forms’ of *deliberate, legitimate, authorised and economically motivated forms of adulteration* Collins, (1993). The American government thereafter according to, Pressman *et al*, (2017) were required to “legally demonstrate *only a reasonable and not absolute* possibility that harm might arise from adulteration”, a provision which went onto define the modern food industry

1.5 - Post World War Two

Integral to America’s post war vision of stability and national security was its unprecedented entrepreneurial expansion and establishment of its service and fast food industries. Full embracement of capitalist ideology, standardisation of processing, embracement of developing technology including food technologies, mono style agriculture and amalgamation of architecture with advertising became a powerful symbol of America’s booming economy and its rapid transition towards the rise in production, sales and consumption of processed/fast/convenience/junk food a.k.a Western Food diet, Schlosser, (2022).

Figure 1.6 - McDonalds Franchise, Standardisation of Processing



Source: Goetz, (2024)

Through replication of business models, subdivisions, mergers, alliances and franchises, proliferation of identical food environments spread and infiltrated all areas of American society. With eventual unification and domination of regional markets, industry's vision to extend its monotonous and mass producing operations became reality when the opportunity to expand beyond its borders was presented with the emergence of globalisation. An insidious process but one of rich reward, the consequences resulted in transformation of food companies into transnational food corporations where sales and consumption of processed food simply augmented.

Figure 1.7 - McDonald's Corporate Expansion

McDonald's Corporation, founded in America during the 1940's -

- *By 1968 the iconic fast-food chain had already opened around 1000 restaurants*
- *By 1974 sales of its revolutionary fast food and signature product – ham/cheese burger - reached 15 billion US dollars, incidentally the same year McDonalds opened its first restaurant in the UK*
- *McDonalds annual gross profit for the year 2023 was \$14.563B (10.26% increase from 2022)*
- *McDonalds operates over 40,000 restaurants worldwide and serves over 70 million customers daily*

Source: McDonalds, (2024), GlobalData, (2024)



McDonald brothers San Bernardino McDonald's restaurant 1948-1955

Source: McDonalds, (2024)

Industrial and post-industrial changes to food represent one of, if not the greatest, transitional periods with hominin dietary evolution. Through continued commoditisation of xenobiotic provision (now considered the predominant harmful standard low cost ingredients of processed food) Wood *et al*, (2023), whether by legitimate or adulterated means has led to sustained cultivation of its dependency. The dynamism and pathway of

events that occurred, particularly during the industrial period signified the beginnings of a redefinition in humanity's relationship with food, and since, food, within two centuries departed from its natural origins.

Van Tulleken, (2023) introduces the third age of consumption –

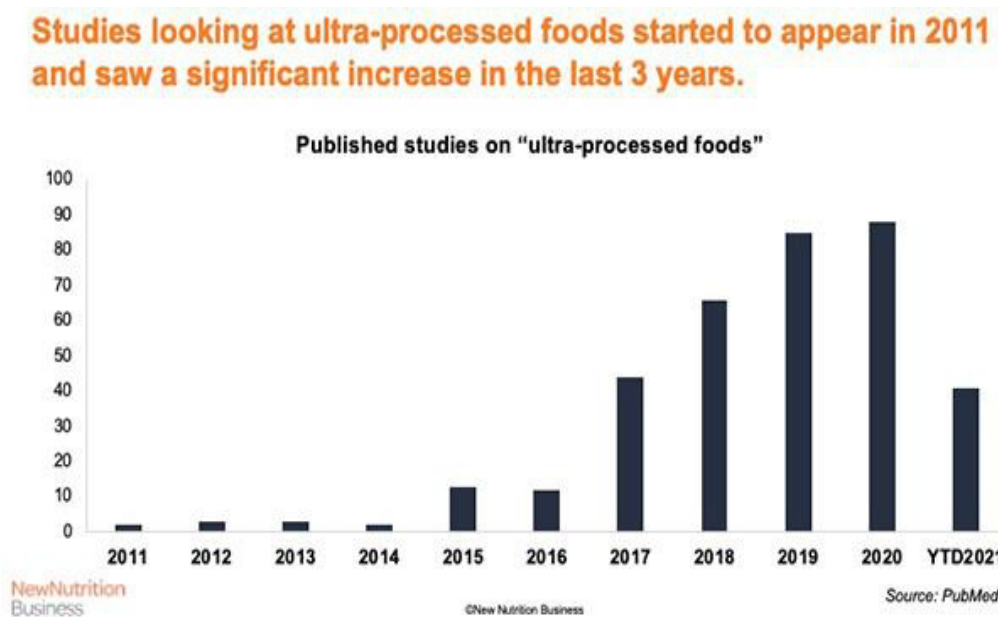
“Food manufactured using previously unknown industrial techniques, novel molecules and ingredients which cannot be bought domestically or used in a domestic setting”.

Critically examine the current landscape for ultra-processed foods and the potential commercial advantages of selling products which are detrimental to health

Chapter 2 -Emergence of UPF and NOVA

The term *ultra-processed* entered the public lexicon around the 1970's in response to concerns regarding increased consumption of highly processed 'fast' food and associated health impacts, Prescott *et al*, (2023), Gibney, (2018). An area of public health concern, it wasn't until Carlos Monteiro's landmark research ('*The main reason for the rapid increase in over weight and obesity globally, especially since the 1980's, is the correspondingly rapid increase in production and consumption of ultra-processed food and drink products*') Van Tulleken, (2023), that focus within research developed a more serious scientific stance.

Figure 2.1- Increase in UPF Studies from 2011



Source: Unknown

The significance of Monteiro's publication was its newly proposed food classification system NOVA (Appendix 1) which classified foods according to extent and purpose of processing and not by their nutritional profile (as was historically the case).

Table 2.2 - *Simplified* Summary of NOVA Classification

<p>NOVA classification -</p> <ul style="list-style-type: none">- Group 1: Unprocessed or minimally processed foods- Group 2: Processed Culinary Ingredients – Oils, Fats, Salt, Salt and Sugar- Group 3: Processed Foods- Group 4: Ultra Processed Foods	<p>Monteiro <i>et al</i>, (2019)</p>
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Foods categorised into groups 1, 2 and 3 according to Van Tulleken, (2023) have typically formed the basis of evolutionary dietary patterns including promotion of long and healthy lives but foods categorised into group 4/UPF, are exclusively industrial and are almost entirely associated with –

Table 2.3, UPF Association

- Low cost ingredients
- Intensive and multiple processing technologies, sequences and assemblage
- Extraction of macro and micronutrients from natural food matrices
- Chemical modification by inclusion of cosmetic additives and preservatives
- Convenience (ready to consume)
- Hyper palatable - energy and calorie dense, high in sugar, saturated fat and salt
- Addictive, liable to be over-consumed
- Displace freshly prepared products from all other food groups – nutritionally impoverished
- Purposefully manufactured displacing all three other NOVA groups
- Includes a wide range of foods - snacks, drinks, ready meals and many other product types
- Reformulated from substances extracted from foods or food constituents
- Reformulated substances rendering them almost imperishable with long shelf life (several years)
- Emphatically branded/ marketed to make them highly attractive especially to children (Excessive information and information saturation)
- Sophisticated single use packaging comprising chemicals for example BPA
- Marketing as part of a multi-buy deal (BOGOF)
- Purported/exaggerated/nonsense health claims for example - ‘no artificial’, ‘low fat’, ‘baked not fried’, ‘low salt’, ‘high in fibre’ ‘free from’
- Radical distortion of truth
- Fortification of vitamins and minerals
- Cheap
- Mass-produced, Mass propaganda utilising (animation, cartoons, films, video’s, magazines, television, radio, big screens, billboards more recently smart media and internet)
- Confusing nutritional analytical data
- Collaborative deals (famous/sports/personalities/celebrities) and other companies
- **High Profitability** (low cost ingredients)

Source: Van Tulleken, (2023), Blythman, (2015)

Despite NOVA's classification, the term UPF currently exists without a universal definition. A contentious issue, it is argued that without a definition, research is left open to interpretation and variability and consequentially may lead to misclassification, bias inaccuracies and inconsistency within conclusive areas therefore inhibiting scientific assessment. Braesco *et al*, (2022) for example, considers NOVA too complex and argues that it prevents foods from being unequivocally defined as UPF. Marino *et al*, (2021) considers NOVA to be one of the main limitations in the evaluation of the role and impact of food processing and Gibney, (2018) argues that there are too many 'nutritional variabilities' which may indicate that not all UPF need to be avoided.

Whilst it is clear that the application of NOVA involves complex challenges and that a clearer definition would support the alignment of research, thanks to its simple socio-political design, NOVA not only has become a popular and widely referenced framework but its application has produced some highly effective results, Elizabeth *et al*, (2020).

Van Tulleken, (2023) however argues that there is a very clear definition and supports the idea that NOVA has not only brought into focus the idea of segregating foods according to processing but has advanced theory and understanding of UPF and health harms and in some instances this has translated into policy. For example, as a result of NOVA application, Latin America established national dietary guidelines to discourage UPF consumption and warn its populations of health harms. Interventions included -

- *Taxation of sugar-sweetened beverages*
- *Restrictions on UPF availability in schools*
- *Nutritional guidelines that expressly recommended avoiding UPF products*
- *Adopting front-of-package nutrition labels*

Source: Peres *et al* (2022)

Table 2.4 – Variability of UPF Definitions, Examples within Research

“Ultra-processed foods are industrial formulations, which in addition to salt, sugar, oils, and fats include substances (in particular additives) used to imitate the sensorial qualities of minimally processed foods and their culinary preparations” Mendes dos Passos et al, (2020)

“Food made mostly from substances extracted from foods, such as fats, starches, added sugars, hydrogenated fats, additives like artificial colours and flavours or stabilizers” McManas, (2020)

“Formulations of ingredients, mostly of exclusive industrial use, that result from a series of industrial processes containing little or no whole foods” Anastasiou, et al, (2022)

2.5 - UPF Identification

For the consumer, identification of UPF can present challenges! Without clear identification on packaging labels, for the most part, an educated guess is the only method. Unless the consumer is aware and avoids UPF purchase, for the population at large, the option of avoiding purchase UPF is unlikely. UPF is ubiquitous and includes a broad range of foods, examples, Table 2.7

Figure 2.6 - Illustrative examples of UPF



Source: Elissa’s Fitness, (2020), EWFood, (2021), Silverman, (2020)

Table 2.7 - UPF Products

Chocolate, Confectionary, Ice cream, Packaged bread/rolls, Carbonated soft drinks, Biscuits, Pastries, Cakes (& mixes), Breakfast Cereal, Cereal bars, Crackers, Powdered, packet foods including dough/pre mixes, Pre prepared pies, Pasta, Pizza & bases, Nut spreads, Fruit chips, Chocolate coated dried fruit, Poultry and fish nuggets, Sausages, Burgers, Hot dogs, Pate, Fish paste, Reconstituted meat products, Powdered and packet foods, Instant soups, Desserts, Sweetened or flavoured dairy products, Cheese spreads, Ready meals, Manufactured eggs, Sweeteners, Margarines, Blended fats and oils, Baby food, Salad, Food supplements, Sauces, Condiments, Yoghurts, Fruit juice, Soft and diet drinks

Source: Monterio, *et al* (2019)

Van Tulleken, (2023) suggests that products containing five or more ingredients which cannot be purchased domestically and which are formulated by complex often unpronounceable chemical ingredients are likely to be UPF. The problem however becomes complex when trying to decipher whether, for example, healthier alternatives, Organic and Vegan foods fall into group 4/ultra processed which many do.

Figure 2.8 - Seaweed Crisps



Source: James, (2024)

The preceding 'healthy alternative' appears to include all the credentials for example, 'seaweed', 'plant based', 'source of fibre', (health claims which are a key element of UPF packaging). Upon closer inspection of ingredients - Seaweed crisp (nori 33%), Tapioca (31%), Rice Powder, Corn oil (98%) and Sea salt, it appears that this product is unlikely to be categorised as UPF. Most of the ingredients above can be purchased domestically so classification NOVA group 3 seems appropriate.

However, given the complex nature of refinement and plethora of chemicals used in refining processes, (corn oil for example, which requires extensive mechanical and/or chemical extraction including refinement and washing by use of chemical solvents and

further chemical refining involving degumming, neutralisation, washing/drying, bleaching, dewaxing and deodorizing including chemical packaging), DOING Holdings, (2021), this process is highly dependent on industrial chemicals.

Figure 2.9 - Corn Oil Refinement Process



Source: DOING Holdings, (2021)

With salt, seaweed, tapioca and rice powder requiring similar methods, including use of additional substances for example, preservatives, processing aides and chemically synthesized fortified ingredients, Seaweed Crisps have undergone extensive chemical processing treatments. With high salt content and inevitable elimination of desirable beneficial nutrients, for example vitamins, is this product a UPF product and is it harmful or beneficial to consume? Whilst interpretation would undoubtedly vary, it is easy to see why so much confusion and controversy exists especially when making informed health choices.

In contrast, both of the following items (Fanta and Swedish Glace Vegan Ice cream) are categorised as NOVA group 4/UPF as both, along with physical, mechanical and chemical processing are produced almost entirely by chemical reformulation.

Figure 2.10 - Example, Group 4/UPF



Source: James, (2024)

Deliberate use of complex and comprehensive terminology, abbreviations, terms and acronyms, characterise the language of the food industry. For the consumer, the subconscious message this may evoke is one of vague reassurance – that these complex terms are regulated and are therefore probably ok to consume, many may not engage in this daunting exercise.

Table 2.11- refers to some ingredient examples and terminology used which in the UK are ‘classified food ingredients’

Table 2.11 - Examples UPF Ingredients and Terminology

Processed carbohydrates for example, sugar syrups, maltodextrins, dextrose, malt extracts and polyols, Processed lipids such as refined and or/ hydrogenated and inter-esterified oils, Processed proteins such as isolates from soy, milk, pea, egg and meat, Derived hydrolysates and gluten, Monosodium glutamate, Artificial food colourings (E colourings), Sodium nitrite, Guar gum, High-fructose corn syrup, Carrageenan, Sodium benzoate, Trans fats, Linoleic acid, Caffeine, Taurine, Glucose, Niacin, Guarana, Citric acid, Phosphoric acid, Carbon dioxide, Fortified vitamins and minerals, Hydrolysed proteins, Soya protein isolate, Gluten, Casein, Whey protein, ‘Mechanically separated meat’, Fructose, High-fructose corn syrup, ‘Fruit juice concentrate’, Invert sugar, Maltodextrin, Dextrose, Tartrazien, Lactose, Soluble or insoluble fibre, Hydrogenated or interesterified oil, Soya lecithin, Cosmetic additives, Additives, Flavours, Flavour enhancers, Emulsifiers, Emulsifying salts, Sweeteners, Thickeners, and Anti-foaming, Bulking, Carbonating, Foaming, Gelling and Glazing agents,

Source: Soil Association, (2023), Monterio *et al*, (2019), Murillo, (2022), Van Tulleken, (2023)

2.12 -Marketing

The role of marketing, particularly brand recognition, not only symbolises one of the food industries most powerful profit making strategies but in terms of terminology has expertly evolved to divert attention from chemical profiles towards ‘happy provoking material’.

Via every possible avenue, for example, *amusement parks, playgrounds, bus stops/tickets, shops, underground, leisure centres, vending machines, sales of material goods for example shoes, public toilets, zoo’s, shopping centres, supermarkets, garages and internet*, industry has promoted UPF to its target audience. Excessive bombardment of marketing tactics, promoted as lifestyle enhancements (convenient and money saving) to the consumer, who unaware of being manipulated inadvertently absorbed industry’s narrative.

UPF marketing is as ubiquitous as UPF and is now a normalised element of social environments and culture.

Without *corporate branding*, how would food or drink be recognised? Below is an ingredients label of a billion dollar UPF product without branding -

Figure 2.13 - Brand Recognition

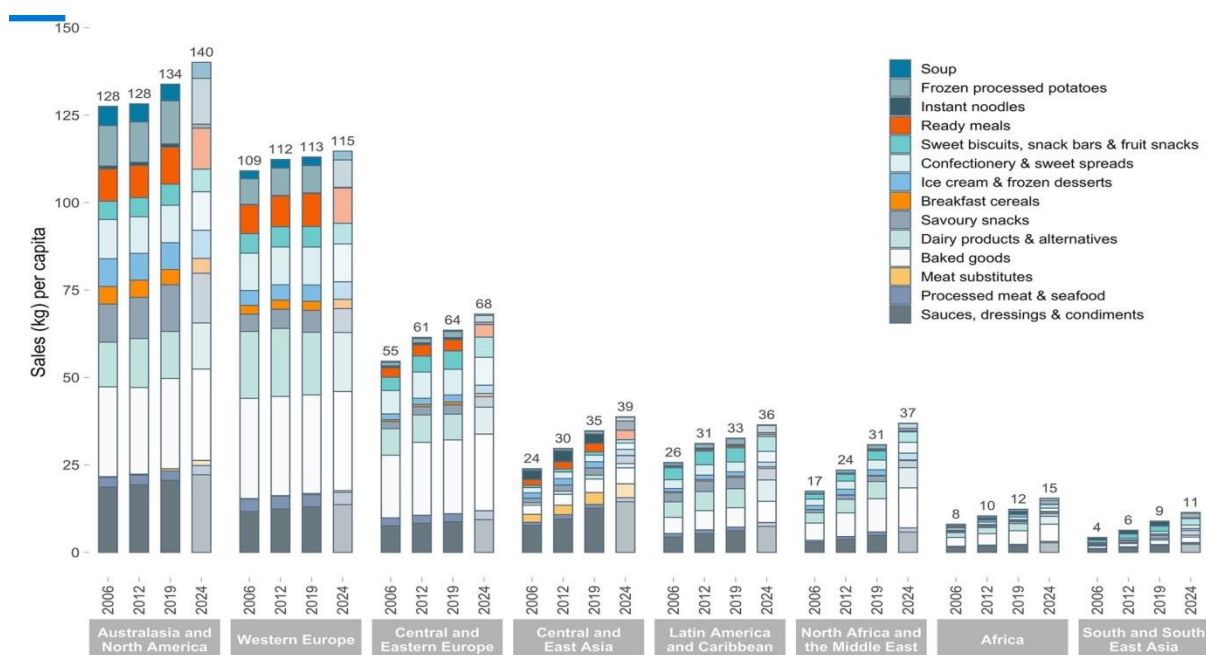
Caramel (Caramel E105d), Sweetners
(Aspartame, Acesulfame K), Natural
Flavourings,
Caffine
Flavouring,
Acids (Phosphoric Acid, Citric Acid),
Carbonated water,
Contains a source of Phenylalanine

2.14 -UPF and Health

Despite advancement in human understanding of the associations between diet and specific nutrients (which form many national dietary guidelines and policies), UPF has essentially been excluded from discussion and therefore policy. Unregulated in this way, the upward trajectory of sales and consumption has resulted in increased trends. The highest daily intake of UPF amongst nations is reported to be in America and Canada – up to 80%, Martini *et al*, (2021), the lowest in Columbia - 16%, Touvier *et al*, (2023) and in the UK around 63% Colombet *et al*, (2022). Although consumption rates are increasing, stagnation in sales has been reported within the northern hemisphere, Maani, (2023). Corporations instead are concentrating marketing and exports into low and middle income countries to which consumption is increasing.

This rest of this chapter demonstrates (by no means is an exhaustive list) evidence of consumption linked to health harms.

Figure 2.15 - Ultra-processed foods sales (kg) per capita by region, 2006-19 with projections to 2024



Source: Baker *et al*, (2020)

2.16 - Hyper palatability

Swinburn *et al*, (2011) reported links identifying high UPF intake and neurobiological consequences for the brain reward neuro-circuitry, Hyper palatable food not only triggers the brains reward system but in doing so creates a pleasurable experience, decreases satiety and contributes to repetitive behaviour, thus promoting addiction, over consumption and obesity. With UPF purposefully engineered to be hyperpalatable, since 1990, adult obesity has doubled, adolescent obesity quadrupled and in 2022, 37 million children under five were overweight, WHO, (2024).

Hall *et al*, (2019) examined the effects of UPF versus unprocessed diets on *ad libitum* energy and concluded that despite both diets being matched with identical calories, individuals consumed more calories when exposed to UPF calories compared to the unprocessed diet. This aligns with Wilson, (2023) who discussed that in a recent study analysing UPF diets in over 9,000 UK children (who consumed over 78% of UPF daily), a dose response relationship was found between UPF (drinks) and adiposity (fat

accumulation) and the higher the intake, the greater proportion of body fat. The study also demonstrated that patterns established during childhood persisted into adulthood.

2.17 - Additives

Additives long known for their detrimental health impacts, Blum, (2018) are a ubiquitous component of UPF. On average, it is estimated that individual intake per annum ranges between 3.6kg – 4.5kg, Lebelo *et al*, (2021) (as high as 8kg, Van Tulleken, (2023)). The cocktail effect of for example, antioxidants, colours, emulsifiers, stabilizers, gelling agents, thickeners, preservatives, sweeteners, flavourings, enhancers, enzymes, acids and packaging gases consumed but ever since their use emerged, studies have consistently demonstrated that additives cause adverse health impacts to health. Examples, (Table 2.18)

Table 2.18 – Examples of Food Additives and Associated Health Harms

- **Tartrazine E102** – Widely used within the food industry and with more than one hundred names used for identification, known as the ‘yellow hazard’, tartrazine has long been suspected to cause adverse health harms. During the early 1980’s, tartrazine was found to cause urticarial, asthma and non-thrombocytopenic purpura BMJ Journals, (1980), More, (2022)
- **Emulsifiers, sweeteners and colours** cause harm to the gut microbiome, including intestinal permeability and inflammation which are associated with inflammatory bowel disease, colorectal cancer and irritable bowel syndrome, Whelan *et al*, (2024).
- **Potassium sorbate** – With links to skin irritations, headaches, intestinal pain, liver damage, allergies, ADHD and asthma, MiNDFOOD, (2023), numerous studies have reported harmful effects, Xiao *et al*, (2024)
- **Aspartame** – A controversial additive, (two hundred times sweeter than sugar and marketed as low calorie), used in thousands of products, aspartame is capable of inducing cancers in different organs, Panorama, (2023)
- **Brown food colours (E150)** – classed as safe by regulators, the IRAC (International Agency for Research on Cancer) classes them as potentially carcinogenic (one study has even linked consumption to Crohn’s disease), Blythman, (2015)

With little safety data supporting use of additives in food manufacturing and with additives an underdeveloped area within research, Bimpizas-Pinis *et al*, (2022), understanding

individual let alone combinational effects on the human body is simply not fully understood.

Figure 2.19 - Artificial Food Dyes



Source: Maryea, (2020)

2.20 - Processing

Formulating and replicating food involves very little (if any) real food and many of the formulation processes are unknown or undisclosed, Blythman, (2015). Chemical, physical and mechanical processing can be just as harmful as the chemical formulations used to reformulate food although, this too is not a well understood area.

Processing Aides, for example, Extraction Solvents – used as a method for separation, although removed from the final product, according to EUR-Lex, (2023) under EU Directive 2009/32/EC, “unintentional and technically unavoidable residue and/or derivatives remain present in food”. Examples of extraction solvents include (Table 2.21)

Table 2.21 - Extraction Solvents

- *Propane*
- *Butane*
- *Ethyl acetate*
- *Ethanol*
- *Carbon Dioxide*
- *Acetone*
- *Nitrous oxide*
- *Hexane*
- *Methyl acetate*
- *Ethylmethylketone*
- *Dichloromethane*
- *Methanol*
- *Propan-2-ol*
- *Dimethyl ether*

Source: EUR-Lex, (2023)

Hexane, for example, does not have to be declared as a food ingredient. According to Cravotto *et al*, (2022) hexane can enter food chains through a variety of end products for example, vegetable oils, colour additives and flavourings. With traces identified in processed food and in human urine (through toxicology studies), Cravotto *et al*, (2022) argues that tolerable daily exposure limits have never been established by any food safety authority. The author discusses how hexane is linked to adverse impacts to the nervous and reproductive systems, including in recent studies, links between toxic effects, Parkinson's disease and endocrine disruption.

Without national legislation or a legally defined list of 'processing aides' (neither in the UK or EU) FSA, (2015), processing aides remain absent from ingredients information and packaging - the public therefore are largely unaware of their presence, Blythman, (2015).

2.22 - Nutrients

With UPF unable to supply critical beneficial nutrients, consumption displaces critical dietary nutrients, for example, wholegrains, seeds, nuts, legumes, pulses, vegetables and fruit.

Wilson, (2023) discusses how high intake of UPF contributes to poor brain health. In a Mexican study analysing the diets of 10,000 individuals, higher UPF consumption lowered the intake of B vitamins, vitamins C, E and minerals. A similar study conducted in Brazil which analysed diets of 32,898 people concluded that consumption of UPF inversely correlated to the intake of vitamins B12, D, E, niacin (B3), pyridoxine (B6), copper, iron, phosphorus, magnesium, selenium and zinc, Wilson, (2023). Wilson, (2023) further stated that when the brain is deprived of critical nutrients, damage occurs to the hippocampus. The hippocampus, incidentally, is the same part of the brain that suffers substantial damage from Alzheimer's disease. Disturbance to this part of the brain can result in mental illness, decline in memory and learning. The authors of Bhave *et al*, (2024) also reported consumption of UPF and links to cardio metabolic diseases, strokes, neurological outcomes including cognitive decline.

With consumption in children estimated to be of the highest intake of population groups, (over 78% in the UK), Genevieve, (2021), the damage inflicted by and underdeveloped brains should be of immense concern, Wilson, (2023).

2.23 - Refined Sodium, Saturated Fat and Sugar

Another contentious area involves high level use of refined sodium, saturated fats and sugars. With all three having undergone considerable scrutiny including a multitude of industry reinventions suggesting the latest product supersedes its predecessor in terms of health benefits, the fact remains that an egregious amount of salt, fat and sugar is harmful.

Rauber, (2018) found that through increased UPF consumption, a significant increase in total energy intake from free sugars, carbohydrates, total fats, saturated fats and sodium uniformly occurred and a decrease in protein, fibre, and potassium. The author found – “*over half of the UK population did not meet the WHO's recommended threshold for NCD prevention, 80% of the higher quintile exceeded recommended upper limits of free sugars, saturated fats and sodium and over 90% did not meet the recommendation for dietary fibre and potassium*”. The study concluded that high dietary intake of UPF is associated with a

range of adverse health outcomes, NCD's, disorders and conditions for example, obesity, type 2 diabetes, hyper tension , other chronic diet relate disease, breast cancer and cardio vascular death.

2.24 - Oral Health

Oral diseases according to Mackenbach *et al*, (2022) have increased dramatically since 1990. The authors argue how UPF are a major contributor to the prevalence and burden of oral diseases and argued that, in particular commercial processing contributes to the carcinogenicity of foods in the mouth. Dental Nursing, (2024) also reported that eating more UPF may be associated with higher risks of developing mouth, throat and oesophageal cancers.

2.25 - Commercial advantages of selling harmful UPF

Since the discovery that xenobiotic formulations could be used as cheaper food alternatives and despite industry having long claimed that industrial food changes have brought a wealth of societal advantages - affordable and plentiful food, food security, safety, wellbeing, happiness, alleviation of poverty including reduction in malnutrition and disease – it seems there has only been one reason - profit.

With no study having reported association between UPF and beneficial health outcomes and studies, for example, Capozzi *et al*, (2021) discussing limitations in understanding interactions between processing techniques, UPF formulation and health outcomes, what is clear is that insurmountable evidence demonstrates that UPF consumption undermines natural and authentic food patterns, not only causes health harms but is a global health concern, Baker *et al*, (2020).

Humanity is living through an era where it is bearing the consequences of prioritising profit over public health.

Critically review the Commercial Determinants of Health (CDoH) discussing the history, evolving definition, and its relevance to non-communicable disease and wider impacts/ influence to public health.

Chapter 3 - The Commercial Determinants of Health (CDoH)

The recovery and development of national economies post World War 2 according to Maani, (2023) is one of the most significant developments of the 20th century where global trade (from 1950 to 2008), increased 27-fold. Despite having brought evident wealth to society, trade has impacted negatively, for example, Cyrus, (2018) argues that although trade may have raised living standards, it has also contributed to adverse health, wellbeing and growing inequalities both in industrialised and developing countries. As awareness of commercial capability and its power to shape physical and social environments is increasingly brought into question, so has the need to monitor societal outcomes, Gilmore *et al*, (2023).

Table 3.1 - Causal pathways by which both variables (health and trade) are connected and their mechanisms

Pathway	Potential mechanism
1. Trade affects health by raising living standards	Increased trade → growth in gross domestic product per capita → reduction in material deprivation → reduced mortality and increased life expectancy
2. Trade affects health by changing inequality	Increased trade → rise in income inequality → increased stress and reduced social cohesion → increased mortality and reduced life expectancy
3. Trade affects health through changing the labour market	Increased trade → increased unemployment and reduced earnings → worsened physical and mental health, higher injury rates
4. Trade affects health through changing the environment	Increased trade → increased pollution → increased Mortality
5. Trade policy changes markets for particular goods	Tariff reductions → increased consumption of health-reducing goods → worsened health outcomes
6. Trade policy influences the regulatory space	Trade agreements → longer patent protection → increased pharmaceutical prices → worsened health outcomes

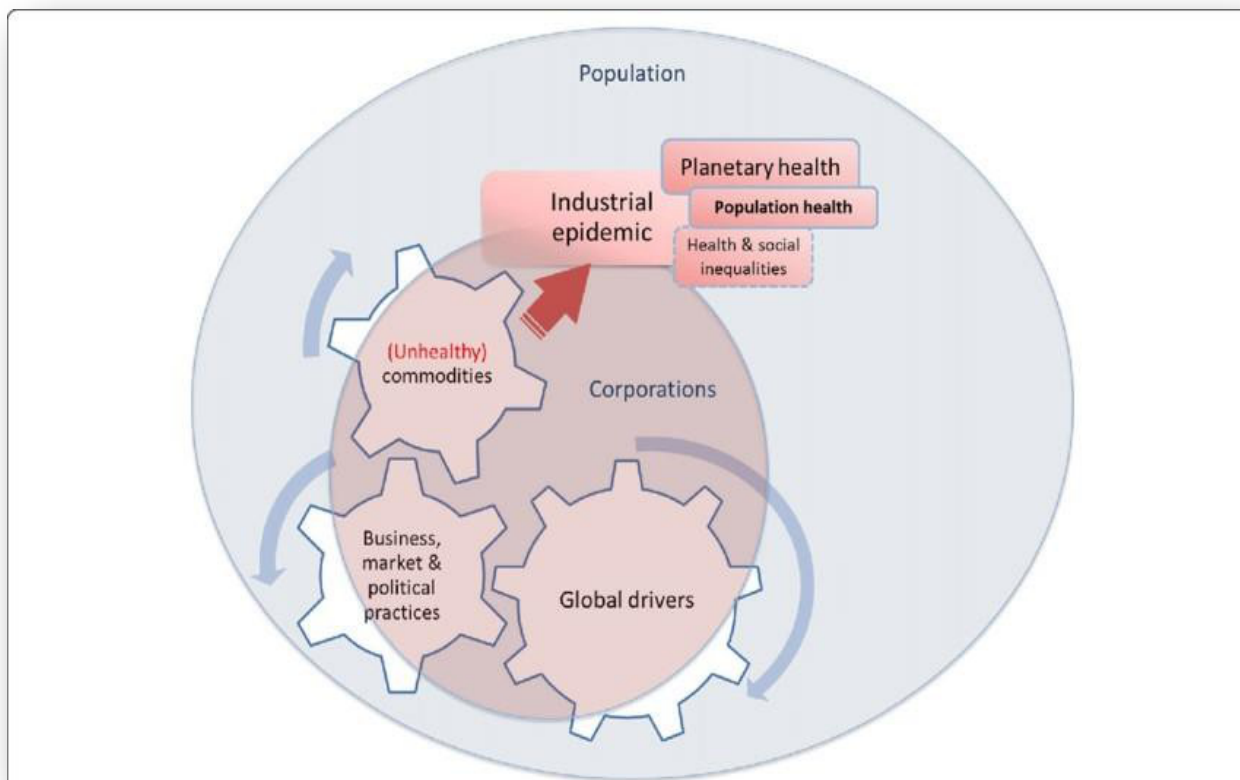
Source: Cyrus, (2018)

A key social determinant and emerging area within public health, The Commercial Determinants of Health refer to the “strategies and approaches used by the private sector to promote products and choices that are detrimental to health” Moodie *et al*, (2021). According to Moodie *et al*, (2021), the purpose of monitoring commercial actions, particularly harmful goods and services inform of societal response. This is critical particularly when corporations selling UPF are able to cause such harm.

Commercial activities greatly influence social, cultural and physical environments and UPF, exclusively made by for profit corporations, Wood *et al*, (2023) is a commercial activity and therefore a commercial determinant of health. Understanding the mechanisms

whereby corporations maximise profit and power according to the authors, is critical to the creation of strategies and policies which would help to reduce the burden of harm.

Figure 3.2 - Overview of the Commercial Determinants of Health



Source: Mialon, (2020)

3.3 - Commercial Sector Influences and Strategies

Certainly from the 1980's, through trade liberalisation and expansion of global markets (globalisation), growth of UPF (within North American and European markets expanded exponentially). Through deployment of diverse and sophisticated strategies (Table 3.4), rising transnational cooperation's were able to develop market dominance, Wood *et al*, (2021)

Table 3.4 - Corporate Strategies

<ul style="list-style-type: none"> • <i>Development of global brand recognition</i> • <i>Production networks</i> • <i>Human resource logistics</i> • <i>Lobbying</i> • <i>Creating barriers to ward off competition</i> • <i>Intellectual property rights</i> • <i>Manufacturing technologies</i> • <i>Increased use of predatory and aggressive marketing tactics</i> • <i>Continuation of abhorrent behaviour</i> • <i>Integrated sourcing including advanced capitalist strategies</i>

Source: Wood *et al*, (2021)

Able to withstand any opposition, the efficiency, agility and adaptability of corporations within dynamic market environments has provided superior competitive advantage. Indeed, the opportunity the food industry has provided corporations in accruing extensive resource and capacity cannot be understated. Wood *et al*, (2023) for example argues how corporate resources and capacities underpin the deployment of strategies - an intentional process to deliberately drive consumer motivation in their favour, for example, by deliberate use of strategies to maximise sales of its fast food, during the 1980's, McDonalds became the world's leading purchaser of commercial satellite photography - by assessing regional growth patterns, it could predict its site selection, Schlosser, (2022).

Wood *et al*, (2021) comments on how market strategies deployed by corporations have received limited attention from the public health community. Most public health research

in this area the authors argue, have focused on, for example, public health implications of marketing, product reformulation, and food labelling.

3.5 - Corporate influence extends beyond sales of food

With no intention of serving humanity's best interests (Provost *et al*, 2023), commercial actors, as they are increasingly known, are not only causing significant population harm but are a global threat to public health. Through *obliteration of small businesses and regional differences, eradication of food structures, cultures and exploitation of vulnerable societies including planetary resources*, corporations have not only transformed the global food system but fully control it.

With wealth far exceeding that of many nations and governments, the power they exert in some instances can be described as sovereign or '*de facto*'. IPES-Food, (2023) reported that "*not only have corporations consolidated their grip by ensuring industry friendly regulatory environments, but have normalized this role ensuring inside decision-making including convincing governments that they must be central in any discussion on the future of food systems*"

Examples of corporate influence is set out in Table 3.6

Table 3.6 - Corporate Influence

Corporations -

- Conduct and fund research which shapes policy to serve their interests. In this regard, under specific circumstances they can capture core state functions including elements of government in order to for example, prevent or weaken regulation of their products and services. This can lead to unregulated activity, limiting their liability; by bypassing the threat of litigation and pre-emption.
- By privatisation, greatly increase what they own and control (not necessarily food businesses, public governance initiatives for example have become reliant on private funding)
- Control direction and volume of research, for example funding medical education and research, where they can skew data in favour of commercial interests (Research bias)
- Protect their profits and wealth through for example, Investor State Dispute Settlements (ISDS). If outcomes favour industry, governments can be bankrupted
- Control international trade, investment treaties and free trade agreements (ISDS agreements are incorporated into many bilateral investment treaties (BITs), free trade agreements (FTAs) and Energy Charter Treaties)
- Capture civil society through founding or funding front groups, consumer groups and think tanks. By cultivating doubt and promoting their agenda corporations brainwash societies
- Collaborate with, for example famous celebrities, sports personalities and non-food companies
- Lobby and incentivise politicians, for example through party donations and ‘dirty money’ they influence and align decisions where the commercial agenda can ultimately influence regulation, legislation ultimately democratic processes and civil liberties
- Control trade and investment costs where food conglomerates benefit, for example, Nestlé. *(In 2023, Nestle retained the title for the world’s largest food conglomerate, commanding more than \$98billion annually, the top ten global food and beverage companies generate \$1.8 trillion in annual revenue (Sorvino, 2022)).*

Source: Provost, (2023), Maani, 2023), (1)WHO, (2023), Norton Rose Fulbright, (2017)

Corporate harms extend into philanthropic giving. By demonstrating ‘charitable activities’, corporations (through sponsorship or financial donations), appear to create solutions for problems that they created. Not only does this distract from the situation they're ostensibly trying to solve but is another way whereby their brand/s can be promoted. With their profile inevitable enhanced, the end result is simply - the entire process continues to generate greater profit, Constant, (2019).

The British Nutrition Foundation, (2024) states on its website that its vision is “simple” - it believes that “healthy, sustainable diets should be accessible to all”...

The charity receives financial donations from Coke a Cola including funding for annual conferences, UK Parliament, (2024), Faull, (2015). Faull, (2015) claimed the charity received £224,769 from Coke a Cola to which it had also paid £350,000 to twenty seven British scientists, eight of whom advised the government on healthy eating initiatives. Other organisations Coke a cola has supported include the National Obesity Forum (£67,300), ukactive (£80,000) and the Science Media Centre (£30,000), Faull, (2015).

3.7 - Regulator

Whilst public opinion may be of the view that food regulators exist to define safety parameters thereby protecting public health, which they do, their integrity, at times can be called into question. For example, Bisphenol A, (BPA) which migrates from packaging into food is linked to adverse health harms including cancer and infertility, EFSA, (2023). According to Panorama, (2023), regarding chemical use and safe limits in food, The UK’s FSA (Food Standards Agency) is advised by The Committee of Toxicology which deem that current levels of BPA used in food packaging are safe.

The Committee of Toxicology is chaired by Professor Alan Boobis. Boobis not only advocated that authorities should ‘avoid focusing on the potential risks that BPA may cause to reproductive systems’ but in its reports, downplayed the risks and included a declaration that no personal relationships influenced the conclusive elements. Boobis, it was later declared was a former vice president of ILSI (International Life Sciences Institute) - a global organisation encouraging collaboration between academics and industry and funded by the world’s largest food and chemical transnational corporations.

The FSA permits Boobis to chair its key advisory committee on toxicity.

Panorama, (2023) reported that over half of the board members of the toxicity committee are linked to food and chemical industries. In 2022 the committee disagreed with a proposal from European regulators to reduce levels of BPA in food. Criticising the regulators approach, this has resulted in UK safety levels remaining 20,000 times higher than in Europe.

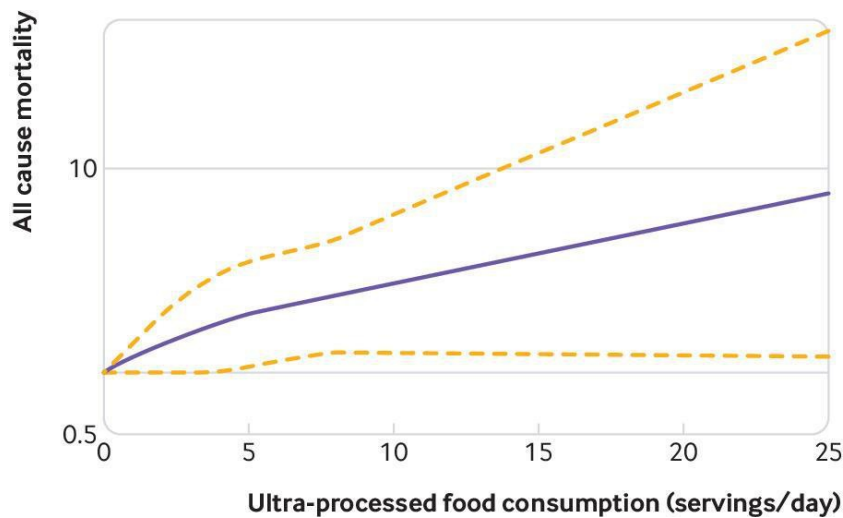
Within the last ten years, the committee on toxicity has not supported a single restriction on the use of any chemical additive in UK additive. Panorama, (2023) concluded that *“judgements made rarely serve to protect public health and more typically protect the interests of chemical and food companies”*.

3.8 - Food health inequities and planetary unsustainability

Health inequities refer to the unfair, avoidable and systematic differences in the health status between population groups. Through displacement of traditional diets and dependency of UPF, corporations increasingly and disproportionately affect food and nutrition security which drives health inequities. With a considerable proportion sold in some of the world's poorest countries (countries already suffering from diseases including malnutrition), Maani, (2023), rates of disease escalate. Conditions relating to excess body weight for example are killing more people in Western society than hunger, World Economic Forum, (2024).

By corporations externalising the costs of their actions, governments, NGO's, charities and civil society are left to deal with the consequences, Gilmore *et al*, (2023). Already financially constrained and lacking sufficient health care, infrastructure and resources, the situation leaves health care systems on the verge of collapse. Countries become impoverished and disempowered, Gilmore *et al*, (2023).

Figure 3.9 - Cox proportional hazard ratios (95% confidence intervals) for all-cause mortality of ultra-processed foods consumption categories



Source: Rico-Campà *et al*, (2019)

The widening power asymmetry between wealthy corporations and nations is an issue not exclusively concerned with poorer, undeveloped countries, in essence, countries within the G7, for example, high income countries such as the UK have serious ongoing issues in respect of food insecurity.

Despite pledging rights to increase food security and nutrition internationally (G7 Food Security Working Group) (1)Gov.UK, (2021), a steady decline in food insecurity, undernutrition, and undernourishment in the UK continues to worsen.

Determined largely by household income (made worse by for example by the recent cost of living crises), deprived populations are forced to buy nutritionally compromised UPF. For many individuals and families, quality nutritious food is simply unavailable because it costs more to purchase and prepare.

Targeting deprived populations with budget constraints, corporations create the perception that purchasing UPF is an advantageous way to save money and within deprived areas, corporations cluster and co-locate UPF outlets, Henny *et al*, (2024).

More than one million people in the UK live in food deserts, Butler, (2018). Deprived of fresh nutritious food, these are areas which are served by expensive corner shops and fast food outlets. Unable to afford the journey to a supermarket or fresh food markets, UPF

becomes the only food exposure. UPF environments also known as obesogenic environments create the largest socioeconomic disparities in health and diet and with excessive promotional marketing targeted towards all populations groups, for example, UPF baby formula, baby snacks, toddler snacks and energy drinks, it is little wonder that deprived populations have higher rates of disease. In 2021, Henney *et al*, (2024) reported that 72% of the most deprived decile of the UK population was living with overweight or obesity compared with 58% of the least deprived. With UPF making up almost two thirds of the UK's primary and secondary school meals, O'Hare *et al*, (2022) explains that it is easy to understand how the effects caused by poor nutrition and inadequate food security are driving serious health conditions. Obesity disproportionately affects populations in poorer areas. Feenie, (2023) reveals how obesity related hospital admissions were exceeding 3,000 cases daily, doubling within six years, admissions, the author reported were twice as likely compared to wealthier areas. This is a similar situation with type 2 diabetes rates.

With the UK Government (and others) consistently failing to address the severity of the situation, and instead allowing corporations to continue their practices, is key to understanding why conflicts exist between global commercial entities and public health interests. Corporate activity remains a considerable barrier towards healthier populations, a sustainable planet and equitable foods systems.

3.10 - Non Communicable Disease

Termed evolutionary discordance, in terms of genetically determined biology and evolutionary dietary patterns, the scale and rate of change resulting from the introduction of harmful xenobiotics and ultra-processing into the human food chain has occurred too rapidly for the species genome to adapt. As a consequence, this novel and ill-suited modern industrialised diet has resulted in significant metabolic disturbance and has manifested as disease, particularly increasing rates of chronic metabolic disease, Cordain *et al*, (2005), Turner *et al*, (2013).

Characterised as non-contagious, mostly incurable with multiple risk factors, non-communicable diseases (NCD's) according to the World Economic Forum, (2019) cause premature death, disability worldwide and are "the predominant global public health challenge of the 21st century".

With global reported deaths rates at 41 million per annum (2)WHO, (2023), NCD's not only affect health but contribute significantly to disparities of opportunity, wealth and socioeconomic fabric of countries. Of the 41 million deaths occurring annually, 17 million occur before the age of 70 and 86% in low to middle income countries. Most at risk are the poorest and vulnerable of societies.

Whilst NCD's refer to a very broad range of conditions, for example *neurological, mental health, Alzheimer's, Parkinson's, glaucoma, hearing loss, digestive diseases, musculoskeletal diseases, chronic kidney disease and autoimmune conditions*, four NCD's contribute to the highest rates of global deaths (almost two-thirds) (2)WHO, (2023) and include examples in Table 3.11 –

Table 3.11 - Four NCD's Contribute to the Highest Rates of Global Deaths

<ul style="list-style-type: none"> • Cardiovascular diseases (including heart disease and stroke; 17.9 million deaths per year) • Cancer (9.3 million deaths per year) • Chronic respiratory diseases (including chronic obstructive pulmonary disease and bronchial asthma; 4.1 million deaths per year) • Diabetes mellitus (2.0 million deaths per year) <p style="text-align: right;">Source: Piovani <i>et al</i>, (2022)</p>
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In the UK, it is estimated that NCD's account for 89% of deaths annually. Imposing colossal burdens to nations and health care systems, for example, obesity costs the NHS around £5.1 billion and 27 billion to the economy annually, the fact remains that whilst many risk factors underlie NCD's, they are largely *preventable*.

3.12 - NCD Risk Factors

Divided into modifiable and non-modifiable, NCD risk factors can be further analysed (Table X). Under behavioural for example, four categories are identified as key drivers of primary NCD rates which include – unhealthy diets, tobacco, alcohol and lack of physical activity. By eliminating behavioural risk factors, which, according to Piovani *et al*, (2022) are known metabolic/biological risk factors, most NCD's could be prevented.

Table 3.13 - Modifiable and Non-modifiable Risk Categories

Non modifiable risk factors	Age, gender, genetic factors, race, ethnicity
<p data-bbox="236 387 555 421">Modifiable risk factors</p> <p data-bbox="236 1043 611 1077">Source: Piovani <i>et al</i>, (2022)</p>	<p data-bbox="818 387 1318 533">Metabolic/biological (e.g. excess weight/obesity, hyperglycemia, hyperlipidemia, raised blood pressure)</p> <p data-bbox="818 607 1377 752">Behavioural factors (e.g., unhealthy diet, tobacco use, physical inactivity, and harmful use of alcohol or other substances)</p> <p data-bbox="818 826 1382 1196">Societal factors, involving complex combinations of interacting socioeconomics (e.g., poverty, low public spending on health, limited access to health services) and environmental parameters (e.g., climate change, sunlight, and air pollution)</p>

3.14 - Unhealthy Diets and NCD's

According to the European Commission, (2024), the EU estimated that during 2019, 800,000 deaths were directly attributable to dietary risks from unhealthy diets; the disease burden it argued corresponding exclusively to NCDs. In its Global Burden of Disease (GBD) study, it not only demonstrated the relative contributions of individual dietary risk factors to specific disease burdens but identified that the relationship between specific dietary elements and NCD association corresponded entirely with rising consumption of UPF. Table 3.15 provides examples -

Table 3.15, Relationship between Specific Dietary Elements, NCD Association and UPF Consumption

- **Diets higher in sodium** were linked to - *non-rheumatic valvular heart disease, cardiomyopathy and myocarditis, rheumatic heart disease, peripheral artery disease, endocarditis, Atrial fibrillation and flutter, aortic aneurysm, stomach cancer and chronic kidney disease*
- **Diets low in fruit and veg** were linked to - *oesophageal cancer*
- **Diets higher in processed and red meat and lower in calcium, fibre, milk and whole grains** were linked to - *colon, rectum cancer and strokes*
- **Diets high in sodium, sugar sweetened beverages, processed meat, trans fatty acids and red meat and low in fruit, fibre, wholegrain, nuts, seeds, vegetables, legumes, polyunsaturated fat, fish/sea food and omega 3** were associated with - *ischemic heart disease*
- **Diets high in sodium, processed meat, red meat and low in fruit, whole grains, nuts and seeds and fibre** were associated with - *diabetes mellitus*

Source: European Commission, (2024)

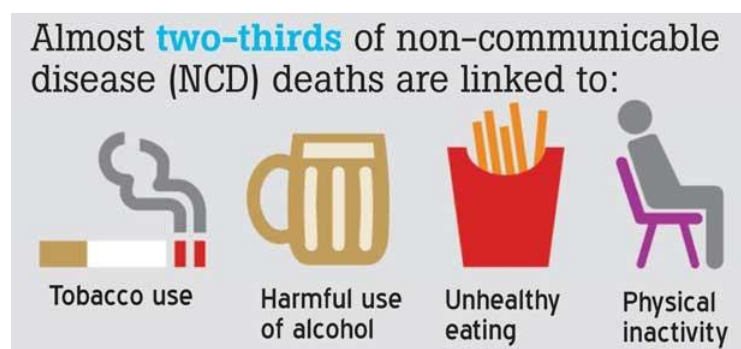
Despite some studies having reported no associations, Pagliai *et al*, (2021), a significant body of evidence demonstrates that high UPF consumption is associated with a broad range of adverse health outcomes, NCD's and potentially, up to 10% reduction in lifespan, LaMotte, (2024).

With the collective harms of the food industry accounting for at least a third of global deaths and four industries contributing to the most harms, Gilmore *et al.*, (2023), Piovani *et al.*, (2022), argues that this basis should be enough to justify immediate action i.e. impactful NCD strategies (extending beyond necessary medical care).

3.16 - NCD Prevention

With all societal groups vulnerable to risk factors and with NCD's expensive to treat, cost effective and affordable prevention strategies are certainly considered the best course of action. Whilst many prevention strategies exist, they are inadequate, politically difficult to enact and/ or are simply unfeasible for individual governments to pursue. Many of these difficulties arise from greater over-arching corporate powers which continually undermine public health. Rauber, (2018) argues for radical whole population strategies in order to reduce UPF consumption which includes - taxation and pricing interventions, adequate labelling of UPF, restricted advertising and promotion and is supported by Gilmore *et al.*, (2023) who calls for improved action from governments, rather than the continued threat of the wellbeing of future generations.

Figure 3.17, Almost two-thirds of NCD's deaths are linked to:



Source: Wagle, (2018)

Critically examine current research assessing the challenges in relation to creating effective policy

Chapter 4 - Policy Background

Achieving necessary change through development, implementation and evaluation of policy remains an inherently complex and challenging task.

Integral to the process are the interactions between the primary administration (Government), its priorities and key actors. Within democratic systems, it remains fundamental that all interests retain equal right to present opinions, data and arguments and this from wide ranging sources. Multiple dimensional perspectives, diverse backgrounds, interests, experience and values inherently shape this vital process and although robust democratic process is crucial, resulting policy or policy proposals can be contentious. Conflicting interests inevitably complicate an already complicated process thus delaying, compromising or even prohibiting necessary change and improvement and the larger the policy area, the more actors get involved - competing objectives can be powerful and proposed reform inevitably results in winners and losers.

Governments and individuals in positions of power must continually seek to prioritise the needs of populations they serve. Within the UK, this is demonstrated (but not necessarily achieved) by examples in Table 4.1 –

Table 4.1 – Policy Actors

- *Central Government, House of Lords, Devolved Nations, Local Government (Local Authorities/Councils) and Civil Servants*
- *NGO's, Lobbyists, Committees, Think Tanks, Interest/Pressure Groups, Think Tanks, Academia, Front Line Services, Subject Matter Experts, Emerging Groups, Industry, Regulators, Charities and Independent Sources*
- *Internationally through organisations for example, European Union and Codex Alimentarius*
- *Public consultation may be necessary to further debate a public issue, for example, the recent consultation on Nutrition and Health Claims on Food: Proposed Legislative Reform*

Source: Gov.UK, (2024)

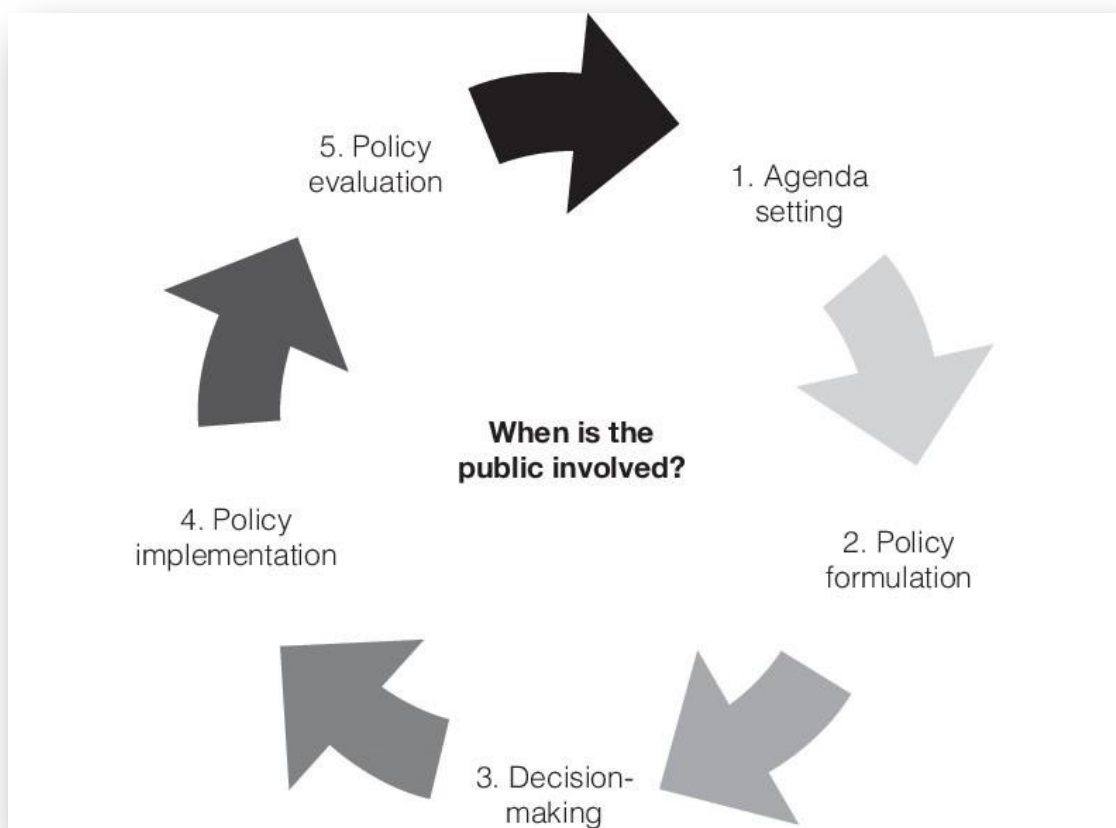
Although policy is generally considered a top down approach many local authorities can develop and implement their own interventions. In essence, one size certainly does not fit all.

Publications often refer to policy theory and cycles which aid the policy design process. Although useful in demonstrating how ideas transition into policy, critics argue that in practice this does not reflect the reality of policy making, Cairney, (2017).

Historically, concerns have risen in relation to the *policy theory - practice gap*, for example, Hallsworth, (2011) argued that attempts to improve policy making suffered as a result of unrealistic model presentation including failing to provide support transitioning desired practice into reality. Indeed, theory can suggest a relatively straight forward practice but the reality of policy process remains vastly complicated, challenging and non-linear. Where coherent policy is achieved, it does not necessarily mean that the proposed objectives will be met, Theory can remain a projection of how policy makers would like to achieve policy, Cairney, (2017), CES Policy, (2022).

Policy coherence should always remain at the forefront of policy design, the primary objective, to allow the proposed intervention the best chance of success.

Figure 4.2 - The Policy Cycle



Source: McQueen *et al*, (2012)

4.3 - UK Policy Process

“Food policy matters because it affects everyone. Food policy shapes who eats what, why and at what cost. It affects our nutrition and health, our livelihoods and communities, our cities and countryside, our nature and climate — now and for future generations”

City University of London, (2024)

Within the realm of food and public health, policy should reflect decisions necessary to improve public health for example,

- Identification of preventable risk factors by promoting sustainable, healthy food production and consumption
- Ensuring vital universal provision and fair access to healthy and nutritious food
- Reduce the harms committed by commercial entities

- Through NCD prevention strategies improve public health outcomes

UK food policy currently is non-linear, chaotic and messy; far from coherent and at present, *non-progressive*.

The UK Government –

- Accepts industry donations
- Allows corporations to offset and avoid paying tax
- Allows industry to fund therefore influence research which is used to inform government policy
- Allows industry to fund food charities
- Accepts industry donations
- Allows it to be influenced by industry lobby
- Permits predatory marketing principally to children
- Allows industry to influence scientific committees and regulators
- Allows industry to undermine meaningful public health policies

Source: UK Parliament, (2024), Panorama, (2023)

If the UK is to become a healthier nation, then urgent redirection towards a sustainable food trajectory must be enacted. Until this happens, food and nutrition will continue to be controlled by powerful food conglomerates thus continually compromising public health.

Despite substantial evidence supporting that UPF is at odds to the promotion of good health, very little prevention or policy has been enacted which has successfully reduced health harms and NCD's. For example, between 1992 and 2020, Theis, (2022) found that despite 14 strategies containing 689 individual policies, in thirty years successive governments have been unable to reduce the prevalence of obesity and associated health inequities. The author concluded that many of the policies proposed were done so in a way that did not readily lead to implementation and therefore were never going to directly shape choices through fiscal or regulatory measures. This includes many proposals involving mainly guidance/standards and reliance on population agency to regulate its self. Largely avoiding interventionist approaches, governments have argued at the unpopularity of nanny state interventions. However without them, there have been no successful or consistent reductions in obesity

prevalence and related inequalities. Interestingly where large scale intervention has occurred, for example, tobacco laws, the results have been tremendous.

With diabetes costing the NHS 14 billion per annum and obesity 6 billion (projected to rise to 9.7 billion by 2050), GOV.UK, (2022), clearly current mitigation/prevention strategies to reduce the harms caused from UPF consumption are wholly inadequate. The UK population are being deliberately misled about the food they consume.

What does appear to be the case is a concerted effort to protect corporate profits (which incidentally have only continued to rise), the continuation of dysfunctional policies, conflicting interests, meaningless labelling of products, false and misleading health claims and targeted predatory marketing.

4.4 - Policy Structure

Currently, the UK addresses the issue of food policy by isolated thinking and assigns food related public health challenges to multiple government policy departments. Critics, for example Parsons, (2020), National Food Strategy, (2021) describe how in England, sixteen individual departments are involved in creating food policy, They argue that fragmenting and sub dividing elements of the food landscape in this way not only creates huge challenges for policy development but by utilising such an approach, policy misrepresents critical understanding of the food system, its complexities, interconnectedness and future.

In a time of unprecedented challenge, demand and pressure, this approach, it is argued, creates -

- Lack of coherent policy
- Lack of overall responsibility
- Policies that undermine others
- Policies that support one area, indirectly overlooking others
- Missed opportunities in supporting other policies
- Competing/conflicting policies for example a policy created to reduce the intake of high calorie, fatty, sugary and salty foods may contribute negatively on economic viability of a policy created to enhance food businesses
- Important issues ‘falling through the cracks’

Source, Parsons, (2020)

Apparent lack of foresight, inaction, weakened or ‘watered down approaches’, ‘quick fixes’, ‘just in time’ approaches, ‘U-turning’ and or delaying ‘ready to roll’ potentially impactful policies has led to all manner of consequences, for example, policies of austerity which have exacerbated diet related illness and consequence according to Marmot *et al*, (2022), of a long standing Conservative Government.

With one area of the food system addressed without consideration for another, as it stands UK food policy is not fit for purpose.

4.5 - UPF Policy

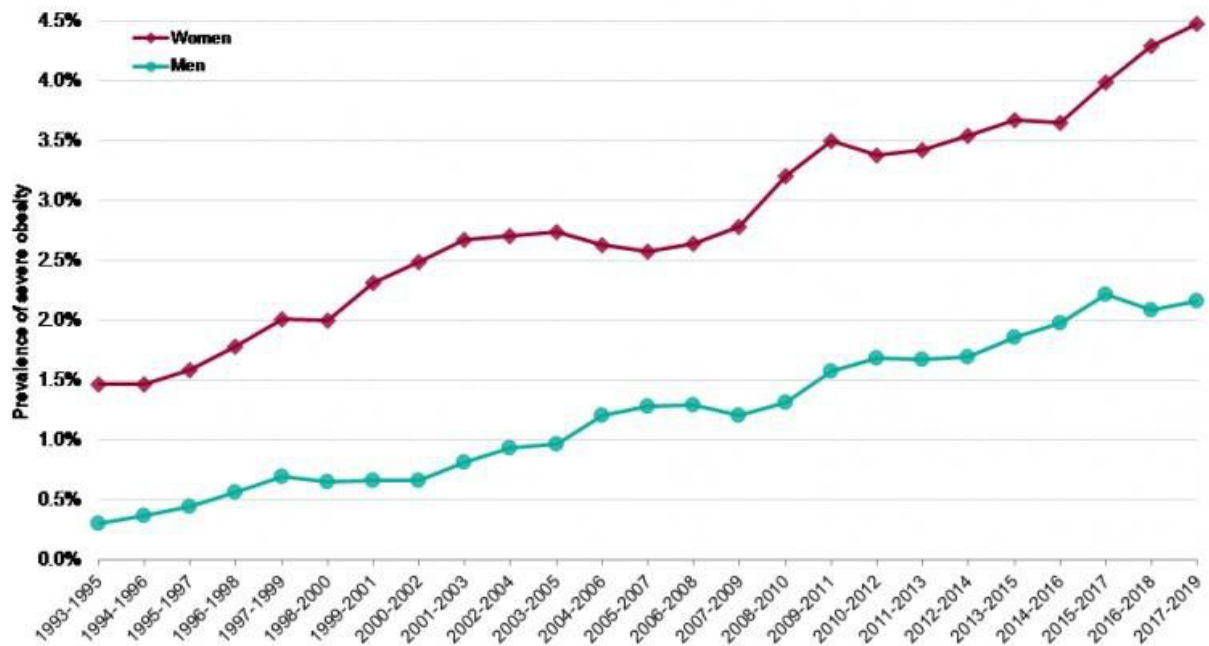
Currently, in the UK, there is no policy restricting UPF consumption. However, an example to reduce some of its most impactful elements was the Soft Drinks Industry Levy (SDIL).

4.6 - SDIL

During 2010, the World Health Assembly recommended that all member states reduce impacts of UPF marketing and non-alcoholic beverage products to children, PAHO, (2023)

As a member state, the UK “currently the third-fattest country in the G7, with almost three in ten of the adult population obese” UK Parliament, (2023) having achieved no progress in this area and with an evident track record of rising NCD rates and a reputation of inaction, backtracked and U-turned public health policies, The Guardian, (2023) in 2018, decided to introduce a SDIL.

Figure 4.7 - Patterns and trends in excess weight among adults in England,



Source: Hancock, (2021)

Industries either had to accept reducing the sugar content in soft and energy drinks or pay a levy. Unhappy with the SDIL, industry argued that the levy would be more effective as a stealth tax than a public health invention, Gurumurthy, (2021).

The results of this intervention were –

- Public health England reported that in 2019 compared to 2015, soft drinks contained 43.7 million fewer kilograms of sugar, Percival, (2021)
- GOV.UK, (2019) reported similar – that 50% of manufacturers reduced sugar content of drinks in the period from 2016 to 2018 (the equivalent of 45 million kg of sugar per annum)

Rogers *et al*, (2023) reported that from 2014 to 2020 changes in obesity levels in children in England (year’s reception and six) were measured. Concluding that “introduction of SDIL was associated with an 8% relative reduction in obesity levels in year six girls, (equivalent to preventing 5,234 cases of obesity per year) and no significant association was found between the SDIL and obesity levels in year six boys or younger children from reception”, the measure appeared to have reasonable success.

Rogers *et al*, (2024) were the first to investigate ‘changes in individual-level consumption of free sugars in relation to the SDIL’. This study found significant reductions in dietary free sugar consumption amongst children and adults.

Although relatively successful, (Percival, 2021) and (Daher *et al*, 2022) raised concerns regarding that by forcing industry to reduce sugar, it would inadvertently switch to artificially sweetened replacements. The authors reported that 65% of children aged between 18 months to three years old consume on average one can of artificially sweetened drink per day.

Rogers *et al*, (2023) reported that in England, between January 2014 and February 2020, incidence rates of childhood hospital admissions for carious tooth extractions declined. The authors of this study concluded that the SDIL may have prevented 5,638 child admissions, equivalent to a 12% reduction.

This intervention appears to have made some improvements in reducing sugar intake in population groups and therefore a potential reduction on obesity and diabetes levels. However, Hagenaaars *et al*, (2021), argued that despite ample evidence supporting the idea that sugar-sweetened beverage (SSB) taxes can efficiently reduce sugar consumption, evidence-based arguments alone will not be enough to realize change.

4.8 - HFSS

Originally due to be implemented in January 2023, Government then was set to implement the long awaited advertising restrictions on HFSS (Foods high in fat, salt and sugar) junk food advertising and multi buy promotions which would have included :-

- A 9pm watershed for HFSS food advertisements on television
- A prohibition on paid-for advertising of unhealthy food and drink products online
- Restriction of HFSS products by volume price will come into force on 1 October 2025

Source: GOV.UK, (2023)

U –turning against this decision, government announced an extension of its implementation to the 1st October 2025. In its defence, it argued that the intervention would not only be unpopular (nanny state) but that it didn’t want to increase pressure on families during a cost of living crisis. It concluded by stating that the delay would provide

government time to review and monitor their impact. However, it did impose a restriction of HFSS products by location (applying to store entrances, aisle ends and checkouts) which came into force October 2022 (2)(GOV.UK, (2021)).

In respect of promotion of healthy eating, this decision did not align (the only beneficiaries being the food industry). Percivil, (2021) argues that action to curtail consumption of UPF foods can, and must, be pursued in tandem with policies targeting ‘high fat sugar salt’ foods.

Addressing the harms of UPF through policy intervention requires comprehensive understanding of food systems. The introduction of one or two interventions will not solve this complex issue and banning all UPF would likely result in considerable disruption, for example, poverty, civil unrest and disease.

To create impactful, unified and meaningful change, a broad multi preventative approach would best support this. Careful decision making including extensive consideration of outcomes must be thoroughly assessed and a serving government must stop shirking responsibility by permitting unscrupulous corporations to undermine public health.

Disincentivising purchase and consumption of UPF through policy enactment is taking place in many countries. Whilst many have not targeted foods based on the degree of processing, regulations some are applying warning labels, particularly salt, fat and sugar to which UPF is inclusive (but which the UK seems incapable of achieving). Table 4.9 provides an example of UPF label warnings in Argentina and Table 4.10 interventions implemented in other countries.

Figure 4.9 - Front of packaging warning labels on UPF in Argentina



Source: Buenos Aires Times, (2022)

Table 4.10 - Global UPF Policy Interventions

Fiscal Policies - Over 50 countries and smaller jurisdictions have instituted fiscal policies / taxes on sugary drinks, energy drinks and or junk foods. In January 2014, Mexico imposed a 10% tax on sugary drinks in response to the high prevalence of diabetes and obesity in its population, resulting in a 12% drop in sales within the year.

Front-of-package (FOP) warning labels - Mandatory warning labels introduced were introduced in Chile (2019), Peru (2019), Israel (2020), Mexico (2020), Uruguay (2021) and Brazil (2022) Studies have demonstrated that significant warning labels have led to decreases in overall purchases of calories, sugar, saturated fat, and sodium.

Marketing restrictions - In 2016, Chile prohibited use of any marketing for junk foods or sugary drinks to children, banning sales and promotions in schools. Chile restricted TV advertising to programming not aimed at children and took the unprecedented step to further ban any junk food advertising on TV from 6am to 10pm. Results have indicated, that marketing interventions will significantly impact the marketing landscape and ultimately UPF intake in Chile.

Source: Global Food Research Programme, (2021), Smith-Tallie *et al*, (2021)

As the Lancet series on the Commercial Determinants of Health stressed - public health cannot and will not improve without action to curtail the commercial determinants of health. This requires urgent action from local to global level – a paradigm shift is urgently needed (3)(WHO, 2023).

Explore ways in which coordinated action could reduce impacts of commercial interests and make recommendations for change in order to improve public health outcomes

Chapter 5 - Recommendations

Never in the history of humanity has there existed such a time where such enormous change is required and within such a short time span. In respect of public health intervention, no matter where food discussions take place, they remain in agreement in that the food system must change. With UPF dominating global food diets and with deeply corrupt political structures at the helm, it can be difficult to understand how policy can create meaningful change.

In increasingly despondent times, hope must create pathways towards solutions.

Within the UK, powerful voices and organisations advocate for necessary changes to the food system, but to effect desired and impactful changes, a unified understanding of food systems is required. As discussed, reducing the power of corporations by one or two, for example, fiscal policies will not solve this complex issue. There must be well devised plans and concerted efforts to create healthier food supply chains and long term sustainable food systems which support the health of humanity. This philosophy is supported by Wood *et al*, (2021) who argue that in efforts to build healthier food supply chains, reducing corporate power through policy action alone will only achieve so much.

One of the ways coordinated action could help address this situation is by recommendations proposed by progressive food systems thinker Henry Dimbleby. Author of National Food Strategy and Ravenous, Co-founder of Leon Restaurants, the Sustainable Restaurant Association and former government advisor to DEFRA, Dimbleby argues for a multi strategy intervention. Not only targeting UPF, the proposals would involve interventions across the food system aiming to divert and influence populations towards, healthier, nutritious food, improving health outcomes and long term sustainability of population health and planet.

With many authors for example, Percival, (2021), Rauber, (2018), Gilmore *et al*, (2023) referenced in this dissertation calling for immediate and radical action to reduce UPF consumption, diet related diseases and the NCD burden, , it is likely that the following intervention proposals and initiatives would be widely supported.

Table 5.1 - Ravenous - Policy Intervention Proposals, Dimbleby, (2023)

Escaping the Junk food Cycle

1. Introduce a sugar and salt reformulation tax
2. Restrict the promotion and advertising of junk food especially to children
3. Introduce mandatory reporting for food companies
4. Extend eligibility for Free School Meals

Reduce diet-related inequality

5. Make holiday Activities and Food (HAF) programme permanent and free to all children and free to all households on Universal Credit
6. Expand the Healthy Start Scheme
7. Introduce a 'Community Eat well' programme, helping those on low incomes to improve their diets

Make the best use of land

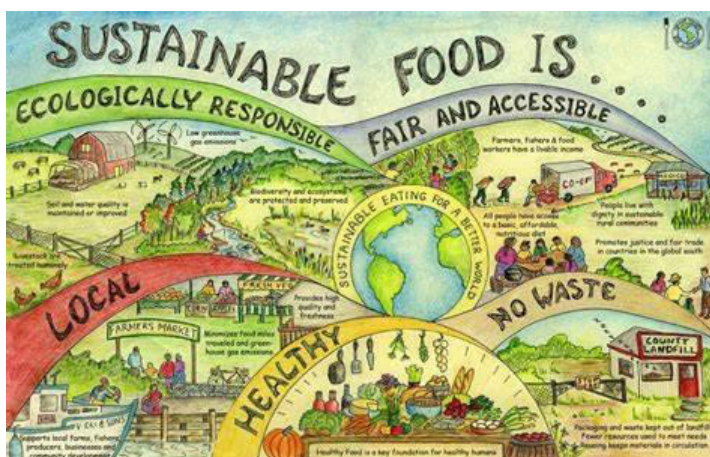
8. Use public money that was previously allocated to the Common Agricultural Policy to pay landowners to deliver public goods
9. Create a 'Rural Land Use Framework' based on the Three Compartment Model
10. Define minimum standards for trade and a mechanism for protecting them

Create a long term shift in food culture

11. Launch a new 'Eat and Learn' initiative for schools
12. Invest £1 billion in innovation to create a better food system
13. Create a national food system data programme
14. Strengthen government procurement rules to ensure taxpayer money is spent on healthy and sustainable food
15. Set clear targets and bring in legislation for long term change

Source: Dimbleby, (2023)

Figure 5.2 - Sustainability



Source: ICDA, (2024)

Table 5.3 - Policy Intervention Proposals, Wood *et al*, (2021)

- Establishing mandatory front-of-pack labelling schemes
- Prohibiting all forms of unhealthy food marketing to children including banning unhealthy food marketed in school environments, on low shelves or checkout counters in supermarkets,
- Banning marketing of unhealthy food during TV programs particularly those scheduled at times when children typically watch TV
- For vulnerable populations - tax exemptions including subsidies on fresh produce
- Taxation of unhealthy products,
- Urban policy that focuses on the distribution of healthy food options in deprived and vulnerable urban neighbourhoods,
- Greater access to fresh drinking water
- Policy action that supports food producers to participate in local and diversified food production, instead of being locked into commodity crop production for example investing in infrastructure better supporting local supply chains
- Supporting farmers supporting farmers to engage in direct sales, local processing and value-adding activities (e.g. food hubs);
- Upgrading of health, food quality and phytosanitary legislation to help small producers overcome existing restraints; increasing support for alternative food business models (e.g. food cooperatives);

Developing integrated agricultural knowledge and innovation systems that could help to address information asymmetries; and public procurement policies that mandate the procurement of healthy, local and sustainable food products

Source: Wood *et al*, (2021)

Figure 5.4 - Local Produce



Source: Cayuga Mutual, (2024)

There are many organisations in the UK undertaking work to promote authentic, nutritious and sustainable food for example, Alexander Rose Charity, Bite Back, Food Sense Wales and Sustain. Sustain, in its recent policy review report, explored example programmes and policies that have progressed towards “bridging the gap between people on low incomes and climate friendly fruit and vegetables”. Its recommendations include (Table 5.5)

Table 5.5 - Sustain Policy Intervention Proposals, Sustain, (2024)

- Adopting a horticultural strategy that includes specific support for organic growing
- Supporting cooperative forms of farming or collaboration through farm clusters, to reinforce small organic producers and enable stronger routes to market
- Introducing a minimum wage specific to agricultural workers
- Setting targets for organic food in public sector procurement, reinforced by supportive funding and legislation.
- Supporting inherently local retail including mobile vending and farmers markets, as well as a wider growth plan to engage larger retailers in increasing access to organic food for lower income groups.
- Recognising the public health benefits of cash transfer schemes (such as vouchers), with increased value for organic and sustainable produce.
- Investing in food hubs thereby supporting the supply of organic produce from smaller producers, via the introduction of infrastructure grants

Source: Sustain, (2024)

Last month, the UK has transitioned to a new administration. According to Quinn, (2024) this administration had indicated that it may revive Dimbleby's proposals which were rejected by the previous administration and restrict the sale of high-caffeine energy drinks to children under 16. One month into its governance, the new administration has committed to –

- Full implementation of HFSS restrictions (October 2025), that will mean a ban on volume promotions and an end to multi buy deals and offers that indicate additional volume is free or discounted, HFSS Toolkit, (2024)

Although a step in the right direction, these interventions are wholly insufficient and will be a long way from the intervention proposals required to overhaul the current food system, discouraging UPF consumption and therefore improve public health. The chosen trajectory of policy (no different from previous administrations), indicates 'business as

usual' in that the UK Government does not take the health issues of its populations seriously and continues to let profit preside over public health.

Figure 5.6 - Profit over Public Health



Source: Newsham, (2021)

Results

In answer to the research question – Are fundamental changes to public health policy necessary to reduce the negative influence of commercial interests within the ultra-processed food industry, the results of the study found that fundamental changes to public health policy are indeed required reduce the negative influence of commercial interests.

In respect of the research objectives –

1. The results of this study have demonstrated that profit and power are the significant commercial advantages of selling UPF which is a specific product produced by for profit corporations.
2. UPF is a global commercial activity that is affecting global population health negatively and is escalating NCD's. The CDoH focus not only helps analyse the health harms caused by the food industry but draws focus to the need for urgent regulatory action.
3. Despite current research providing ample evidence of links in consumption of UPF and adverse health impacts, NCD's and reduced mortality; implementation of policy is complex and challenging. Governments impose very little effective policy and continue to be influenced by corporations.
4. Proposed by various food system thinkers and organisations are many potentially effective solutions to reduce UPF consumption, increase consumption of nutritious whole food and reduce the NCD burden.

Discussion

Summary of findings and interpretation of results

With reference to the research question – ‘Are fundamental changes to public health policy necessary to reduce the negative influence of commercial interests within the ultra-processed food industry?’ the study demonstrated that this is fundamentally necessary.

The major findings are that corporations, by selling UPF (a specifically designed product produced by for profit corporations), generate extravagant profits which they use to gain influence and power.

High in harmful additives, calories, sugar, sodium, trans-fats, and low in essential macro- and micro-nutrients (fibre, vitamins and minerals), global consumption of UPF has largely replaced traditional diets thereby causing a range of NCD’s, reduced lifespan and health inequities. As a consequence, global rates of ill health are escalating.

The CDoH provides a focal point whereby the selling of UPF and the harms it causes can be closely analysed and the recommendations then used to support, guide and implement policy.

In high income countries such as the UK, where over half of daily dietary energy intake comes from UPF, rates of obesity, NCDs and health inequities are high. Very little commitment or action has been demonstrated by government to reduce the health harms of UPF and the population is getting sicker. With UPF consumption rates higher in the UK than any other country in Europe, the financial implications of the nation’s deteriorating health are immense.

The health harms created from UPF consumption are extremely serious and require urgent attention. Although governments have committed themselves to implementing, for example, HFSS policy, this will not address the drastic need to reduce UPF consumption.

Despite overwhelming evidence in support of policy implementation, the UK government should at the very least be implementing policies similar to the one discussed in Latin America.

UK food policy is a complex and challenging area and its structures chaotic. In addition, commercial interests influence policy decisions thereby obstructing action. This is a large

part of the reason why policy to control UPF use is largely non-existent. Government allows power asymmetries to exist between public health and food corporations and this is an area which needs urgent reconfiguration.

The UK Government is obligated to not only protect public health but morally and actively seek to optimise it. Reversing, U-turning, and weakening down suggested policies, or not implementing them at all as is often the case, is a public service and public health failure.

With many individual ‘food system thinkers’ and organisations already proposing policy ideas, legislative frameworks and strategies, achieving necessary change is possible.

A top down blanket intervention, for example, tobacco regulations, would not work in this situation. Populations have to eat so attempts to reduce UPF consumption must be a well devised long term sustainable plan.

The irony is that the government is shooting itself in the foot by allowing itself to be influenced by commercial incentive. A sick nation will not be able to work and pay taxes. This should be an ample warning signal. The question is – how bad does this situation have to get before drastic intervention becomes unavoidable?

The most promising ideas come from those that understand the power of food systems change. Multiple invention approaches (UPF warning labels, blanket banning of advertising of UPF, community growing of fruit and veg, school cooking) are just some of the possible pathways.

It appears that the new government are committed to fulfilling the HFSS proposals but at some point more far reaching interventions will need to be enforced. Why wait? Change could offer meaningful, impactful and sustainable long term health improvements for populations, future generations and improve planetary sustainability.

Implications of the study for current theory

This study reinforces existing theory that UPF consumption causes adverse health harms, NCD’s, morbidity and health inequities and that industrialised food corporations through extravagant profit making and accumulated wealth and power are undermining public health.

Where the situation is heading to

The production of adulterated food and warnings of associated harms to health have been going on for centuries.

Future research needs to focus on a number of areas. For example: the cocktail effects of additives; the relationship between the food industry, regulators and government; the expansion of community food production; cookery in the school curriculum; more sustainable farming and land use.

The House of Lords Committee Enquiry on - *Food, Diet and Obesity and its call for written evidence for its enquiry into the roles of foods for example UPF and foods high in fat, sugar and salt in tackling obesity* will be published later this year and it is hoped that that from this some policy will be implemented.

Limitations of study

The lack of a universally defined UPF definition currently limits understanding of the health implications of many UPF products, especially those marketed as healthier options. Whilst it may be the case that not all UPF is necessarily bad for health, definition and package warning labels would be beneficial.

Insufficient definition of what constitutes UPF could also be a factor in limiting government action..

Recommendations

In alignment with the recommendations proposed in this study, it is strongly considered that a multiple interventional approach to reduce the harms of UPF must urgently be enacted. As a matter of priority –

- UPF warning labels should be legislated
- All unhealthy marketing should be banned
- Energy drinks should be banned
- Further reformulation regulations (salt, fat and sugar) should be implemented
- A sensible review of additive use developed

- A blanket ban of corporate interference in lobbying, science committees, regulation and academia
- Provision of nutritious healthy fruit and veg must be made available and affordable to all
- Domestic science/cooking, growing food must be made a part of the school curriculum
- Increased growing and provision of vegetables and fruit must become a priority and be funded

Conclusion

Since the introduction of xenobiotics into hominin diets and the use of complex industrial mechanical, physical and chemical processes to produce economical synthetic reformulations of food, food in its evolutionary form has gradually been displaced. Ultra-processed food is now considered the predominant global diet and is a commercial determinant of health. Made by for profit corporations, sales and consumption drives diet related disease, contributes to the global NCD epidemic and drives health inequalities and planetary unsustainability. Although evidence informs governments of the risks, governments are reluctant to act, instead favouring corporate interests to which they are incentivised.

The extent of global ill health requires not only urgent intervention but food systems transformation and no single intervention will solve this. Urgent action is necessary.

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