



A MALNOURISHED FOOD SYSTEM: HARMFUL IMPACTS OF UPF CONSUMPTION ON HEALTH AND NUTRITION IN AFRICA





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ACRONYMS

CFHD	Children and Family Health Devon
CVDs	Cardiovascular diseases
HLPE	High Level Panel of Experts on Food and Nutrition
LMICs	Low- and middle-income countries
MoHCC	Ministry of Health and Child Care, Zimbabwe
NCDs	Non-communicable diseases
SDGs	Sustainable Development Goals
SSA	Sub-Saharan Africa
UPF	Ultra-processed food(s)
UPFB	Ultra-processed food and beverage
TARSC	Training and Research Support Centre, Zimbabwe
WHO	World Health Organization

GLOSSARY

All-cause mortality

Death due to any cause. The term is commonly used in medical research to measure the total number of deaths that occur within a specific group of people over a specific period of time.

Carcinogenic

Has the potential to cause cancer.

Cardiometabolic diseases

Cardiometabolic disorders include cardiovascular diseases, such as heart failure and pulmonary arterial hypertension, and metabolic diseases, such as insulin resistance and type 2 diabetes.

Cardiovascular diseases

A group of disorders of the heart and blood vessels that include coronary heart disease, cerebrovascular disease, rheumatic heart disease, and other conditions.

Denatured

A chemical process that alters the molecular structure/characteristics of a substance.

Fractionated

A chemical process that separates a mixture into fractions or components.

Glycemic response

How quickly a food affects blood sugar (glucose) level.

Gut dysbiosis

Imbalances in the diversity and composition of gut microbiota.

Gut microbiota

The human gastrointestinal tract harbours a complex and dynamic population of microorganisms, the gut microbiota, which exert a marked influence on the host during homeostasis and disease. Diet is considered as one of the main drivers in shaping the gut microbiota across an individual's lifetime. Intestinal bacteria play a crucial role in maintaining immune and metabolic homeostasis and protecting against pathogens. Altered gut bacterial composition (dysbiosis) has been associated with the pathogenesis of many inflammatory diseases and infections.

Non-communicable diseases

Chronic diseases not transmissible directly between people, with a long duration and slow progression; are rarely fully curable; commonly referred to as lifestyle diseases.

Nutrition transition

The shift in dietary patterns from traditional diets rich in vegetables, cereals and complex carbohydrates and fibre, to more Westernised diets with a notably higher proportion of sugars, fats, and industrially produced, animal-sourced foods.

Phytochemicals

Beneficial chemicals naturally present in plants, which reduce inflammation, slow the growth rate of some cancer cells, and help regulate hormones, amongst other benefits.

Satiety

The quality or state of being fed or satisfied to or beyond capacity.

Triple burden of malnutrition

The coexistence of overnutrition, undernutrition, and micronutrient deficiencies.

Ultra-processed foods and beverages

Formulations of ingredients, mostly of exclusive industrial use, typically created by a series of industrial techniques and processes.

INTRODUCTION

In this factsheet, we discuss the health impacts of ultra-processed food (UPF) consumption in Africa. While research on the health implications of UPF consumption globally is relatively nascent, it is advancing. Research points to clear and direct associations between increased UPF consumption and an increase in a range of diet- and nutrition-related non-communicable diseases (NCDs).

The consumption of ultra-processed foods (UPF) and ultra-processed pre-prepared foods is dominating global food supply, with its consumption rapidly rising in every part of the globe, including Africa, as described in early factsheets in this series (Baker et al., 2020; Popkin & Reardon, 2018; Reardon et al., 2021). Increasingly, ultra-processed foods and beverages (UPFB) are displacing and replacing minimally processed foods, freshly prepared meals, and traditional diets, causing significant nutritional, social, economic, and environmental impacts (Baker et al., 2020; Bonaccio et al., 2020; Cornwell et al., 2018; Julia et al., 2018; Luiten et al., 2016; Machado et al., 2019; Martini et al., 2021; Monteiro et al., 2013; Popkin and Reardon, 2018; Poti et al., 2015; Srour et al., 2022; Steele et al., 2017; Steele et al., 2021).

As articulated in greater detail in previous factsheets in this series, UPF (defined as formulations of ingredients, mostly of exclusive industrial use, that result from a series of industrial processes and contain little or no whole foods) is increasingly becoming the backbone of what is being called a 'globalised diet', dominating the global food supply (Monteiro et al., 2019). While UPF tends to be associated with diets in higher- and middle-income countries, increasingly, low-income countries are shifting towards diets with more UPF. This is due to their relative affordability and accessibility, as well as the status associated with changing food environments, social relations, and economic conditions, which is aided by corporate interests stretching into these new markets. These changes are primarily due to urban migration, increased income, increased wage labour reliance, and limited time for food preparation (Constantinides et al., 2021; Reardon et al., 2021; Turner et al., 2018). As such, we are witnessing a rapid rise in the consumption of UPF across the African continent, with dietary patterns shifting towards more processed and less diverse diets (Leite et al., 2022; Knorr et al., 2020).

The increasing consumption of UPF in Africa is linked to what is called the triple burden of malnutrition, where there is simultaneously a rising incidence of overnutrition, undernutrition, and micronutrient deficiencies – leading to diet-related non-communicable diseases (NCDs) (FAO et al., 2020; HLPE, 2017;

HLPE, 2020; Karanja et al., 2022; Reardon et al., 2021). NCDs are chronic diseases not transmissible directly between people, with a long duration, slow progression, and are rarely fully curable (Dain., 2018., Hadian et al., 2021). NCDs are commonly referred to as lifestyle diseases as they are driven principally by unhealthy behaviours interacting with genetic, physiological, and environmental factors (WHO, 2023). They are the leading cause of death worldwide and present a huge burden on individuals, communities, and economic resources, particularly in low- and middle-income countries (LMICs).

As discussed in previous factsheets in this series, food systems in Africa are changing rapidly due to various factors, such as trade liberalisation, urbanisation, employment, and income growth, and industrialisation of farming and retail sectors (Reardon et al., 2021; Wanyama et al., 2019). This transformation of the food system has profound implications for food environments, dietary patterns, and health. In particular, this has led to what is termed a 'nutrition transition', i.e. the shift in dietary patterns from traditional diets rich in vegetables, cereals, and complex carbohydrates and fibre, to more Westernised diets with a notably higher proportion of sugars, fats, and industrially produced, animal-sourced foods (Mockshell & Ritter, 2023; Popkin, 2001; Popkin & Gordon-Larsen, 2004.; Steyn & Mchiza, 2014; Holmes et al., 2018).

In many African cities, the nutrition transition has been associated with an increase in the incidence of overnutrition (e.g., excess weight and obesity), coexisting with undernutrition (e.g., hunger, stunting, and wasting), and micronutrient deficiencies (e.g., in zinc, vitamin A, and iron) (Holdsworth & Landais, 2019; Osei- Kwasi et al., 2020). UPF consumption is making up a greater proportion of diets due to the increasing availability, accessibility, and relative affordability of UPF. This is driving and deepening the triple burden of malnutrition. Obesity and diabetes are on the rise, while wasting and stunting persist (Mockshell et al., 2022; Reardon et al., 2021). This undermines the second and third United Nations Sustainable Development Goals (SDGs) – to end hunger and to ensure healthy lives.¹ As a serious public health concern in sub-Saharan Africa (SSA), the triple burden of malnutrition receives significant attention by policy makers (Holdsworth & Landais, 2019), yet the role of UPF in driving the triple burden of malnutrition and associated NCDs is largely absent.

1. The concept of healthier diets has gained traction in the international policy discourse and has been incorporated into the Sustainable Development Goals framework (SDG 2) and the UN Decade of Action on Nutrition 2016–2025, which provide global and national impetus to address malnutrition (Karanja et al., 2022).

A MALNOURISHED FOOD SYSTEM:

Rising UPF consumption, diet-related NCDs, and the triple burden of malnutrition in Africa

UPF, such as cheap instant noodles and biscuits, contributes to undernutrition and micronutrient deficiencies through a combination of ways. Increased UPF consumption reduces the intake of NOVA groups 1–3,² thereby displacing less-processed, more nutritious options, as well as adding into human diets a variety of novel chemical components and compositions that are less effectively metabolised (Lawrence, 2023).

UPF, i.e. NOVA food group 4 differs from the other NOVA food groups³ in that there are several causes for concern:

- the content is nutritionally void; calorie-dense; high in sugar, sodium, and saturated and trans-fats;
- the range of ingredients is unfamiliar and industrially produced; and
- the series of processing, distribution and packaging needs, affects the quality, digestibility, and chemical composition of these foods.

The high consumption of commercial snack food is also increasingly common in the diets of infants of complementary feeding age in African countries, including Senegal and Tanzania (Zehner, 2016), amongst others. For vulnerable groups, especially infants and children living on marginal-quality diets, UPFB can contribute to both obesity and stunting (Tzioumis et al., 2016; Uauy & Kain, 2002).

2. **NOVA group 1:** unprocessed or minimally processed foods; includes foods such as fruit and vegetables, meat, eggs, milk, grains, pulses. **NOVA group 2:** processed culinary ingredients such as salt, oil, sugar, or starch, which are produced from NOVA1 foods. Processes include pressing, centrifuging, refining, extracting, or mining, and their use is in the preparation, seasoning, and cooking of NOVA1 foods. **NOVA group 3:** foods such as freshly baked bread, canned vegetables, or cured meats, which are obtained by combining NOVA1 and NOVA2 foods. These are products made by adding salt, sugar, or other substances found in NOVA1 and NOVA2 foods, using preservation methods such as canning and bottling, and, in the case of breads and cheeses, non-alcoholic fermentation.

3. See Factsheet 1 for more detail on NOVA classification and the distinction between UPF and processed foods.

Studies suggest that a limited decline in undernutrition in SSA may be partially linked to the increasing consumption of UPF among infants and young children (Feeley et al., 2016; Nordhagen et al., 2019; Pries et al., 2019). In particular, the lifelong negative impacts of malnutrition at gestational and early childhood stages – associated with poor maternal health and nutrition, and nutritionally weak complementary feeding – can be irreversible, and is of particular concern (Frayne & McCordic, 2018).

Due to their poor nutritional profiles, hyper-palatability, and content of biologically harmful compounds, UPF are massively detrimental to our health, and are now a substantial contributor to global increases in obesity and a range of diet-related NCDs (Zhang & Giovannucci, 2022).

Changing dietary habits and food environments on the African continent are accompanied by rising obesity and diet-related NCDs and persistent micronutrient deficiencies/undernutrition, affecting all socioeconomic groups (Agyemang et al., 2016; FAO et al., 2020; Holdsworth & Landais, 2019; HLPE, 2017; HLPE, 2020; Imamura et al., 2015; Karanja et al., 2022; Naghavi et al., 2017; Reardon et al., 2021).



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The rising prevalence of preventable NCDs, including cancer, cardiovascular diseases (CVDs) and type 2 diabetes are becoming the main cause of mortality in SSA, responsible for 37% of deaths in 2019, rising from 24% in 2000 (Rischke et al., 2015; WHO, 2022). While NCD mortality is declining in high-income countries, this epidemiological transition is now acute in LMICs, with NCDs set to overtake communicable, maternal, neonatal, and nutritional diseases combined, as the leading cause of mortality in SSA by 2030 (WHO Regional Office of Africa, 2014; WHO, 2023). While this trend is better

documented in middle-income countries in Eastern and Southern Africa, such as Kenya and South Africa (Igumbor et al., 2012; Wanjohi et al., 2021), it is also being observed in countries with lower income levels, such as Zambia and Zimbabwe (Loewenson et al., 2022; Mukanu et al., 2021; TARSC et al., 2022). The number of people in Africa who are living with diabetes, for example, is expected to reach 47 million by 2045, up from 19 million in 2019. This puts great strain on already under-resourced health systems, crumbling under the double burden of NCDs and communicable diseases. The health impacts of the NCDs associated with increasing UPFB consumption presents a cost for households, health services, and the economy. For example, CVDs alone were estimated to cost African countries USD 6 billion, already in 2010 (Thow et al., 2021).

While there are multiple factors driving the increased incidence of NCDs, many are diet and nutrition related, and have been shown to be associated with increased consumption of UPF. Ghana and Kenya, amongst other countries, typify this dietary and epidemiological transition, which they have recognised as a pressing public health concern (Agyemang et al., 2016; Cira et al., 2016; Ghana Statistical Service, 2015; Holdsworth et al., 2020; Kenya National Bureau of Statistics, 2015; Ministry of Health Ghana, 2012; Ministry of Health Kenya, 2015; Ofori-Asenso et al., 2016; Ofori-Asenso et al., 2017; Rischke et al., 2015; Rousham et al., 2020).

As highlighted in earlier factsheets in this series, producers of UPF are increasingly targeting low-income countries and communities. This creates the condition for persistent and perpetual food and nutritional deprivation, and a cycle of NCDs, with long-term health, socio-economic, and societal impacts – with generational implications (Samodien et al., 2021). Yet, the relationship between UPF, malnutrition, and NCDs is failing to get the urgent policy attention it demands.



THE HEALTH IMPLICATIONS of UPF consumption

The detrimental health impacts of UPF consumption have gained increasing interest and are now widely documented. A large and growing body of research has found significant associations between UPF intake and a multitude of health risks, including excess weight and obesity, type 2 diabetes, kidney and liver diseases, cardiovascular and cerebrovascular diseases, ischemic heart disease, cancers, and all-cause mortality,⁴ amongst others (Bonaccio et al., 2020; Cordova et al., 2023; Fiolet et al., 2018., Global Food Research Program, 2023; Rico-Campà et al., 2019; Schnabel et al., 2019; Srouf et al., 2022).

Studies have found that adverse association between UPF and mortality risk are only partially accounted for by the specific nutrients such as sugar that are present in large quantities in such foods, suggesting that nutrient composition alone is not able to fully explain the enhanced mortality risk associated with increased consumption of UPF (Kim et al., 2019; Louzada et al., 2015; Mendonça et al., 2017; Rico-Campà et al., 2019). The effects of processing, characterised by nutrient and non-nutrient components of foods and their molecular interactions, have direct health implications.

Extensive food processing has an impact on nutrient availability, digestibility, and gut microbiota⁵ (Fleming, 2023). Ultra-processing negatively affects both food structure and nutrient composition, leading to denatured,⁶ fractionated,⁷ and recombined energy-dense and micronutrient-poor foods (Fardet et al., 2018). Food structure, which is highly dependent on processing conditions,

4. All-cause mortality means death due to any cause. The term is commonly used in medical research to measure the total number of deaths that occur within specific group of people over a specific period.

5. The human gastrointestinal tract harbours a complex and dynamic population of microorganisms, the gut microbiota, which exert a marked influence on the host during homeostasis and disease. Diet is considered as one of the main drivers in shaping the gut microbiota across an individual's lifetime. Intestinal bacteria play a crucial role in maintaining immune and metabolic homeostasis and protecting against pathogens. Altered gut bacterial composition (dysbiosis) has been associated with the pathogenesis of many inflammatory diseases and infections (Thursby and Juge, 2017).

6. A chemical process that alters the molecular structure/ characteristics of a substance.

7. A chemical process that separates a mixture into fractions or components.

is increasingly recognised to play a role in satiety⁸ and glycemic⁹ responses (Fardet, 2016). These all conflate the risk of non-communicable, nutritional-related diseases (Lane et al., 2021).

The range of industrial additives (for taste, colour, preservation, etc.) have been linked to inflammation and gut dysbiosis,¹⁰ and contain hormone-disrupting chemical compounds leached through plastics used in industrial manufacturing and packaging (Abt et al., 2019; Alaejos & Afonso, 2011; Bouvard et al., 2015; Center for Science in the Public Interest, 2023; Gibis, 2016; Halden, 2010; Heindel et al., 2015; Leo & Campos., 2020; Miclotte & Van de Wiele, 2020; Muncke, 2011; Ratnatunga, 2023; Srouf et al., 2022; Steele et al., 2020; Thompson et al., 2009; Zinöcker & Lindseth, 2018).

The inflammation and cardiometabolic disturbances¹¹ caused by artificial additives alter and disturb gut microbiota and therefore their functioning (Zinöcker & Lindseth, 2018). Plastic packaging for UPF contains additional compounds with carcinogenic or endocrine-disrupting properties that can leach into foods before consumption (Seferidi et al., 2020).



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8. The quality or state of being fed or satisfied to or beyond capacity.

9. How quickly a food affects blood sugar (glucose) level.

10. Imbalances in the diversity and composition of gut microbiota.

11. Cardiometabolic disturbances relates to the chemical processes affecting the cardiovascular system. Cardiometabolic disorders include cardiovascular diseases, such as heart failure and pulmonary arterial hypertension, and metabolic diseases, such as insulin resistance and type 2 diabetes. They represent some of the most serious health challenges of the 21st century.

Newly formed compounds related to the heating and processing result in serious harm, especially to cardiovascular health (DeJarnett et al., 2014; Ranci re et al., 2015). Chemical changes due to the application of high heat commonly used in UPF processing produces known carcinogenic¹² chemicals such as acrylamide and acrolein (Ferreira et al., 2019; Louzada et al., 2015). Food processing also leads to the dramatic loss of nutrients and phytochemicals¹³ naturally present in plant foods (Hu et al., 2019).

The convenience, hyper-palatability, poor satiability, pervasive marketing, and addictive design of UPF results in overconsumption, exacerbating the issues raised above. Such foods are being made increasingly available, accessible, and desirable by the UPFB industry, rapidly extending their reach into Africa (Igumbor et al., 2012). Sales continue to grow across the world, with children consuming more UPF than older generations (Baraldi et al., 2018; Cediel et al., 2018; Khandpur et al., 2020; Machado et al., 2019; Marino et al., 2021; Marr n-Ponce et al., 2018; Monteiro et al., 2013; Neri et al., 2022; Polsky et al., 2020; Rauber et al., 2018; Shim et al., 2021).

12. Has the potential to cause cancer.

13. Phytochemicals are beneficial chemicals, naturally present in plants, which reduce inflammation, slow the growth rate of some cancer cells, and help regulate hormones, amongst other benefits.



GOING FORWARD:

Thoughts on food and nutritional policies

With rising incidence of overnutrition, undernutrition, and micronutrient deficiencies, leading to a rapid rise in diet-related NCDs, national food and nutrition policies and guidelines on the continent have focused efforts on trying to reduce related health risks and economic burden. Yet, the regulatory requirements needed to minimise UPF consumption remain ambiguous and voluntary, and distorted by corporate lobbying. A radical paradigmatic shift is required on how food and nutritional security policies understand food insecurity on the continent.

It is vital that food and nutrition policies on the continent clearly address UPF consumption by creating and enforcing mandatory measures to bring the unrelenting and aggressive influence of the UPFB industry in food environments and policies under control. The unrestricted advertising and sale of UPFB, in particular targeting children and young people, in the Eastern and Southern Africa region raises particular concern, as it implies longer-term, sustained consumption of these foods and the likelihood of NCD outcomes at earlier ages (TARSC et al., 2022).



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A deeper understanding of the main health determinants and detriments of UPF is required to reduce and minimise harm. As the severe health implications are being increasingly documented, urgent action is required. This includes removing certain products from the market and banning harmful manufacturing processes and packaging, as well as reducing their accessibility, affordability, and ubiquitous nature in both rural and urban areas.

Despite the increasing recognition that UPF is a considerable factor in driving illness and disease globally and in Africa, multilateral fora are silent on the massive role rising UPF consumption is having on human and planetary health. International platforms must address this issue head-on, learning from other countries' approaches to tackling these intersecting issues – as discussed in the next factsheet in this series – and provide support to countries to phase out and ban certain processing methods and products.

As the United Nations Decade of Action on Nutrition (2016–2025) comes to an end, we call on global leaders to shift the spotlight to UPF, and how this industry is driving, in particular, human malnourishment and disease, and to urgently address this unnecessary harm through policy and action to safeguard socio-ecological systems. As civil society, we must continue to advocate for a just transformation of the agroecological food system, which adequately integrates diets, nutrition, health, and well-being into discourse and policy actions, across the rural-urban spectrum.

With the compounding impacts of pervasive and persistent hunger and malnutrition on the continent, the hidden culprit, UPFB, needs to be unpacked and addressed to prevent worsening conditions. More research is needed to fully understand how UPFB is integrated into everyday life in Africa, particularly in African cities, and the impacts this is having on the health and well-being of African people (Osei-Kwasi et al., 2020).



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