

Food System Strategic Assessment: Introduction

This Strategic Assessment 2023 was carried out using a literature review and to a large extent input from a pool of experts with a broad range of expertise across the food system. The contextual parameters that informed our approach, methodology and analysis are presented in this introduction.

1.1 The food system – overview

The 'food system' is generally described as the sum of human activity and interactions with and within the natural and human created environment that are essential for the production, processing, trading, selling and the consumption of food. Over the past decades increasingly sophisticated, multi-dimensional analysis of the food system has evolved recognising that there is a multitude of components, inputs and outputs connected through various causal chains. For a top-level representation of one recent conceptualisation of the food system see figure 1 showing the main actors, relationships, drivers, outcomes and feedback loops.

Figure 1: Food system illustration showing the main actors, relationships, drivers, outcomes and feedback loops.

Source: [Foresight4food: Food systems Model](#)

The food system represents a complex dynamic adaptive system with other such systems being well studied in physics, biology, sociology, economics, and other sciences. The defining features of complex dynamic systems are: dependence on internal and external resources as well as initial

boundary conditions, complete interconnectedness of components, constant change and restructuring of internal relationships, emergence of novel features, and dynamic non-linear responsiveness to perturbations from the outside or from within, allowing for robustness and also rapid restructuring (Gros, 2015). These features, and in particular non-linear, interconnected dynamics make predictions difficult. It is also acknowledged that the current food system models have their limitations with regards to translating insights into actionable policy (Brouwer et al., 2020).

Our understanding of the food system is currently undergoing a shift in what needs to be considered as important factors to monitor with regards to desired outcomes. For example, our understanding of malnutrition was historically shaped by the idea of a general lack of food, while today the global obesity crisis represents a different kind of malnutrition or nutrient poverty with regards to a balanced diet, with the current food system partially responsible for it (Ingram, 2020). Moreover, assessing food system activities with regards to environmental impact has become a recent priority. As momentum and political will is increasing in the UK and globally to transform the food system with the goal to reduce its negative impacts on the planet and human health, a clear definition and understanding is needed of what needs to be transformed and how, and to what effect on the outcomes of the food system.

1.2 The global context

The evolution of the global food system has over the past century accelerated at an incredible speed to supply food to an ever-growing human population. This has been driven mostly by technology innovation and the evolution of industrialised global trade. At the same time, over the past five decades scientific evidence has irrefutably shown the numerous negative impacts of the food system on the planet and human health (Benton et al., 2021; Rockström et al., 2020; Willett et al., 2019).

The increasing awareness of these impacts has led to a shift in perspective of how various food regulators design policies over the past two decades, and even more so over the past five years. Besides the traditional core responsibilities to ensure that food is safe to consume, sold in a manner that its origin and contents are honestly presented to consumers, and that vulnerable consumers are protected from the harm certain foods may pose to them, additional areas of regulatory responsibility are recently being considered with the aim to help build a better food system and mitigate some of its current negative impacts on the planet and human health. In addition, it has been widely acknowledged that international collaboration needs to be at the core of such efforts to maintain and extend food security (Elliott, 2021).

1.3 The UK context

The UK food system has been studied from a systemic perspective in recent years, and such studies are carried out increasingly with a focus on understanding long-term changes and trends that will impact:

- human (and to some degree animal) health outcomes, ranging from hunger to nutrient deficiencies, food borne diseases, human chronic diseases, to obesity; in addition, aspects of plant health need to be considered (as for example in the Plant Biosecurity Strategy for Great Britain (Defra, 2023))
- social and economic outcomes, such as food poverty, food production sector development, food prices, wages, and labour availability and conditions
- environmental outcomes, such as greenhouse gas (GHG) emissions, water and land use, soil composition, biodiversity.

A comprehensive 2020 study applying a systemic perspective highlighted the following longer term structural characteristics of the UK food system as having major impacts on its overall outcomes (Hasnain et al., 2020).

- high reliance on external food sources, in particular from the EU
- high reliance on foreign labour in the food sector, mostly in production and processing (the majority from EU countries)
- high consumption of highly processed food (highest rate in the EU) contributing to negative health outcomes on a population level
- strong commercial concentration/consolidation of food producers/processors and retailers
- high dependency of the primary food production sector on subsidies (Defra, 2021d)
- most agricultural land is used for cereal and animal production.

Most of these characteristics are not unique to the UK. However, it has become increasingly acknowledged by UK governments that action has to be taken at a national and international level to prevent and reduce more of the negative future outcomes that may result from these structural features of the UK food system. The awareness that some, if not most of these features, can generate systemic vulnerabilities and lead to major disruption of food security and the economic stability of the food system in times of crisis has further increased over the past 12 months as the impacts of several national and global events have been seen (see next section).

1.4 The current geopolitical context of this study, March 2023

At present, any analysis of the UK food system is strongly impacted by a number of regional and global events that have unfolded over the past three years. Some of these events were already showing clear impacts on the UK over the past four years while others are at an early stage of being understood as factors to monitor, as they are very likely to increase levels of uncertainty in decision-making at many levels.

The major 'external' events at present impacting the internal dynamics and evolution of the UK food system are (not in any order of magnitude of impact):

- the longer term-effects of the Covid-19 pandemic having caused global supply chain disruptions, labour shortages, economic contraction, long-term shifts in working patterns, and increased inequality, among others (Delardas et al., 2022)
- the consequences of leaving the EU (Brexit), such as labour shortages, regulatory uncertainty, changing trading patterns, economic contraction in some sectors, among others (see section 7)
- significantly increased energy/fuel costs with many knock-on effects on the economy more generally and specifically on food production, processing, and retail
- systemic impacts of the war in Ukraine and the impact of changing trade relations with Russia affecting the global food system on many levels, such as the global food security of cereals and oil seeds and supply chain disruptions affecting processing ingredients and inputs into primary production such as fertilisers. These are likely to lead to longer-term changes in food related trade flows and investment
- other geopolitical tensions, such as between China and the US, accelerating a trend to protectionist policies and changing supply chains due to tariffs in many countries.

These factors have in turn impacted the UK, exacerbating the cost of living crisis, driving inflation above 10%, high energy prices and stagnant, or in real terms, falling wages. These are all highly likely to affect the UK economy for at least the next two to three years.

1.5 Methodology

This Strategic Assessment is mainly based on qualitative methods for eliciting expert insights, via three inputs, namely an online survey, in-depth interviews, and an online workshop. Care was taken to achieve a good spread of expertise as well as professional responsibilities across the food system among selected experts. As the focus of this report is on the UK, the majority of experts were from the UK (56/88), and 32/88 from abroad with a spread of European and non-European countries. In addition, a literature review was carried out to capture academic as well as grey literature including web sites, government reports and media reporting to cover the most recent events to complement and expand on expert insights. For details of the methodology see Appendix B.

1.6 Drivers of change and issues analysed for this report

Findings of this study are presented along the major current drivers of change that affect the UK food system. The current status of each driver is assessed at the beginning of each section using information up to early March 2023 to estimate the potential scale of impact and future trajectory that may shape developments in the UK over the next 10 years. From a conceptual point of view, it should be noted that drivers are understood for the purpose of this report as high-level thematic or contextual issues that shape more specific changes and trends in the food system. Specific trends can interact with and be shaped by several drivers simultaneously. In this report only the most salient drivers impacting the UK food system are selected. The following significant drivers are considered:

- UK economic condition
- change of consumer attitudes
- commercial drivers
- technology innovation
- climate change/environmental factors
- Brexit and regulatory change

The order of drivers is not ranked in any way. Trends and issues of relevance to the FSA's remit are presented under the driver that most impacts them.

The selected experts' assessment of magnitude and timeline of impact for the current issues was found to be overwhelmingly shaped by the current uncertainties of UK and global political issues, such as the war in Ukraine, the position of Russia and China in global trade, the consequences of Brexit, and the impact of resulting current UK and global economic pressures. This led to a tendency for the more immediate acute impacts to be assessed as having also a higher impact than those of a longer-term chronic nature.

Based on the analysis of all expert inputs to this study (survey, interviews, workshop) the following top-level driver/issue maps of the UK food system, and potential opportunities for the UK food system were drawn. Here no distinction between drivers and issues was made, reflecting equal treatment by participants of this study. In the subsequent sections of the report however, specific trends and issues are presented as subordinate to their major driver.

In figure 2 the current issues and challenges impacting the UK food system are shown as identified by experts consulted for this study in January and February 2023.

Figure 2: Current issues and challenges impacting the UK food system as identified by experts consulted for this study in January and February 2023.

While most experts consulted for this study focused mainly on challenges to the UK food system, several opportunities were mentioned, although often with the caveat that it may take another five years to reap any tangible benefits from them. These opportunities are shown in figure 3.

Figure 3: Opportunities for the UK food system given current drivers and impacts as highlighted by experts consulted for this study in January and February 2023.

The majority of issues presented in the following sections were considered by experts as of high importance with systemic impact and current immediate effects expected to last into the near- to mid-term future. It is also acknowledged that the selected issues are shaped by highly interconnected drivers and systemic interactions and not single causes, and that individual identified issues can interact with each other and overlap to some degree.