# FUTURE OF OURFOOD SYSTEM

Opportunities, challenges and change in our global food system.



## Executive Summary

The global food system integrates highly advanced technology and human labour in a global production and distribution chain. Food is an essential human need and agriculture is the bedrock of global political, economic, and human security. The food chainwhich includes scientists, farmers, producers, distributors, packagers, grocers, and consumers-has downstream effects that reach into every home and community.

#### Setting the context

Statista projects that revenues in the food industry will reach approximately 9.43 trillion USD in 2023, with a compound annual growth rate (CAGR) of 6.21 percent annually through 2027.<sup>[1]</sup> The sector currently employs 27 percent of the world's workforce (down from 40 percent in 2000) and accounts for 4 percent of global GDP.<sup>[2]</sup> The sector provides jobs to millions of workers and supports community development and economic well-being. Food is also inextricable from human diversity and culture. It is fundamental to the ethnic, cultural heritage of communities as well as their physical environments.

In a world confronting the existential challenge of man-made climate change, as well as rising malnutrition and obesity, disease outbreaks, the impacts of industrialisation and over-consumption. We must take a hard look at how food production and distribution is organized and find feasible yet profitable ways to reengineer it. Maximising global food production from a sustainable base requires smart strategies, global cooperation, and technological innovation.

The recent crisis in Sri Lanka vividly demonstrates how food insecurity not only puts people in desperate situations but destabilises the nation-state and international relations.<sup>[3]</sup> Economic fluctuations and supply chain breakdowns caused in large part by the covid-19 pandemic have put additional stress on a system already buckling under strain. Indeed, the data on agriculture and food production are sobering. The United Nations estimates that the global population will reach 10 billion people in 2050, with an average life expectancy of 77 years.<sup>[4]</sup> Food production will need to rise by 60 to 70 percent to meet the increased food demand in this timeframe. <sup>[5]</sup>If the global trend toward consuming more meat continues, global emissions from food production would also increase 60 percent by 2050.<sup>[6]</sup>

Agriculture accounts for five billion hectares, or 38 percent of the global land surface. Approximately one-third of this is cropland, while two-thirds consists of meadows and pastures for livestock grazing.<sup>[7]</sup> Thirty-six per cent of all plastics produced globally are used in food and beverage packaging, while 85 percent of food-related plastic waste ends up in landfills or as unregulated waste. Greenhouse gas emissions associated with the production, use and disposal of conventional fossil fuel-based plastics is expected to grow to 19 percent of the global carbon budget by 2040.<sup>[8]</sup>

These challenges are massive, but there is room for cautious optimism provided we act quickly and with foresight. Our research shows that the food sector can respond proactively to the challenges of climate, waste, and nutrition. Technological innovation is reshaping the food system to make it cleaner, more transparent, more equitable, and healthier, while also being profitable. With investor and government support, entrepreneurs can find profitable and sustainable ways to secure the future of food.

# Contents

Adapting the global food system to the demands of the 21st century is one of the most crucial challenges facing business, government, and civil society today. We present our current findings to encourage ongoing and informed deliberation in this space among all stakeholders.

In analysing the data, we identified seven key themes driving the future of food:



The remainder of this report proceeds as follows:





We analysed global trends and conducted interviews with experts across the food system to identify the macro themes that we believe will collectively shape the future of food. We hope to empower brands to leverage transformational technologies and ideas impacting the food sector and to inspire meaningful change towards a sustainable food system. While we do reference issues of significance to developing countries, the data and analysis herein takes a predominantly Western perspective.

The companies we consulted include:



BerryWorld is a global berry breeding and marketing company based in the United Kingdom.

Tim Newton Technical Director



#### Cellular Agriculture

**Cellular Agriculture** is the first UK startup in the cultured protein space, with a bioprocess technology platform to support industrial scale cultured meat, seafood, and milk production.

> Illtud Llyr Dunsford CEO & Co Founder

TATE 🕂 LYLE

Tate & Lyle is a Global company with expertise in sweetening, fortification and texture developing ingredients and solutions for the food and beverage sectors.

Helen Bass Global Head of Marketing & Insights



Higher Steaks is a UKbased food technology company that specializes in developing cellcultivated meat products.

> Benjamina Bollag Founder & CEO

#### Nomad Foods

Nomad Foods produces and markets a wide variety of frozen food products, including frozen vegetables, seafood, pizzas, and ready meals. The company owns several well-known brands, including Birds Eye, Findus, and Iglo.

> Annelie Selander Sustainability Director

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Mosa Meat is a Dutchbased food technology company that specializes in the production of cellcultivated meat.

**Robert Jones** Vice President, Global Public Affairs



Enough is a food-tech company whose purpose is to make the most sustainable source of food protein.

> Jim Laird CEO





Ella O'Toole Product Manager



Wrap, or the Waste and Resources Action Programme, is a not-forprofit organisation based in the United Kingdom that works to promote more sustainable and resourceefficient practices in the food and beverage industry, as well as other sectors.

> Tom Quested Senior Sector Specialist



Huel produces nutritionally complete food products with minimal impact on the environment.

> James Collier Co Founder & Head of Sustainable Nutrition

> Jessica Sansom Sustainability Director



Too Good To Go is a mobile application that connects consumers with surplus food from local businesses to reduce waste.

> Chris Spinelli Partnerships Marketing



Deliciously Ella is a plantbased food & wellness platform. starting from a recipe website, the business has evolved into a restaurant, a range of plant-based food products, an app, a collection of bestselling recipe books, a podcast, and a large, growing social media community.

> Michael Corlett Strategy & Insight Director



Feeding Britain is a UKbased charity that works to alleviate hunger and food poverty.

> Andrew Forsey National Director

We also referenced official reports from organizations as the WWF, United Nations, United States Food and Agriculture Organization, Mintel, UK National Food Strategy, The Grocer, and Stylus.

A comprehensive set of references can be found in the endnotes to this document on page **34–35**.

#### FUTURE OF OUR FOOD SYSTEM



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Sustainability

This theme reflects the relationship between the production of food and the system's impact on the environment.

The production, processing, and packaging of food currently generates one-third of global greenhouse emissions.<sup>[9]</sup> Climate change disruptions, felt in rising surface temperatures, extreme weather events, and unpredictable water cycles in turn affect crop yields.<sup>[10]</sup> We seem to be caught in a downward spiral whereby human actions and a worsening climate interact to speed up and amplify the environmental and biodiversity crises.

Shifting the global food system from a resource-intensive and extractive model to a sustainable one requires consultation with stakeholder groups and communities, as well as significant investment in innovative technologies and public policies. We need to dramatically reduce emissions, ensure food accessibility, and improve nutrition, and reduce waste, within a very short timeframe. The global food system includes local, regional, national, and global levels, as well as numerous moving parts that must be coordinated across the food chain. Disaggregating one part from another in practice is virtually impossible. However, to better evaluate the sustainability challenge, we isolate three key variables below (farming, manufacturing and waste, and packaging). The overall picture, as one of our contributors suggests, is one of a system that is no longer functioning effectively, despite notable pockets of innovation:

The global food system is broken and needs dramatic change to reduce its huge contribution to global warming and to enable a healthy and affordable diet for the world's population. Innovation is happening - with the birth of new consortia and partnerships, and £billions invested in food tech - but we need faster and much more radical action.



Farmers will drive any meaningful systemic change in agricultural production. These stakeholders have the knowledge and skills necessary to grow the food that the world needs, as well as an ongoing commitment to the land. To address the climate challenge, farming systems needs to adapt quickly. Skillful deployment of new on-farm technologies will be essential.

Rapid progress in artificial intelligence, robotics, bioenergy, biomaterials, and temperature and water sensors provides a pathway from the Industrial Era to Agriculture 4.0.

As Wade Barnes, President and CEO of Farmers Edge argues,

"the ability to gather and integrate detailed information from growers' fields, coupled with advances in weather forecasting, predictive modelling, and machine learning, is changing farming from a business that often reacts to the past to one that uses data to support decisions for the seasons ahead."[11]

This new paradigm of precision agriculture harnesses the power of big data to reduce negative externalities and maximise production, while positioning farming at the centre of the digital age.<sup>[12]</sup> Many consumers and the media continue to have old fashioned notions about what farming involves, but farming today is high-tech and data driven.

Yet relying on a tech-fix to address the full-scale of the sustainability challenge is not a viable option. In our interviews with contributors, we found that policy solutions and innovations that scale rapidly and work with consumers, rather than against them, are key. Vertical farming, for example, is a technological innovation that uses artificial growing systems such as hydroponics. <sup>[13]</sup> To be done effectively, vertical farming would also change the geography of food production, labour patterns, and the relationship between rural and urban development, hence an emphasis on social system innovation and adaptation is needed as well.

An expert at BerryWorld, a berry breeding company, highlights some of the key challenges:

"I think one of the biggest challenges we've got is labour availability. The media likes to talk about harvesting robots or being able to pick robotically. But doing that at speed and with precision? We haven't yet got machines that can do that."

**Tim Newton** Technical Director, BerryWorld Innovation on the farm is also entwined with the future of higher education and training. Policymakers need to incentivise students to choose agriculture as a career. Ensuring that a pipeline of global scientific talent is on offer to the agricultural sector is also critical.

Helen Bass - Global Head of Marketing & Insights at Tate & Lyle, an ingredients company, emphasised that *"we need our younger generation to be doing science jobs, to be doing STEM jobs, to be seeing that as a really exciting career path. Getting younger girls into STEM subjects can be quite challenging but we need a lot of scientists for the future. We need people to feel inspired not just for the food industry, but industries in general."* 

#### Manufacturing & Waste

As Annelie Selander - Sustainability Director at Nomad Foods, a frozen food producer, emphasizes:

#### "If you look at some of the challenges we have in the food system today, waste is one of the fundamental issues."

Manufacturing is an area in which smart innovation and strategy will improve environmental outcomes. Industrial-era legacy buildings and food waste generate excessive climate emissions.

This part of the food supply chain is responsible for numerous negative externalities that diminish environmental and human health and are not adequately priced into the true cost of food.

Manufacturing processes can be wasteful in themselves, but they can also engender waste further along the supply chain. Most food waste is at household level. 45% of global greenhouse gases can only be tackled by changing the way we produce products and food. About 30% of global greenhouse gases come from food production and around a third of the food produced does not get eaten, being lost, or wasted. Indeed, as Tom Quested, Senior Sector Specialist at Wrap notes, *"8 to 10 percent of humanity's greenhouse gas emissions is associated with food that never gets eaten"*. If we include the whole supply chain, half of all food waste in the UK comes from households.

The World Food Program confirms that if wasted food were a country, it would be the third-largest emitter of greenhouse gases after China and the United States.<sup>[14]</sup> This is why United Nations Sustainable Development Goal 12.3 aims to reduce global food waste and food loss by fifty percent by 2030.

Tom goes on to say that addressing this, waste requires change across our food system. "If we are going to reduce the impact of this waste, we need solutions that tackle the root cause of waste: systemic changes to how we buy, manage and consume food."

Reducing food waste should be a business priority and is also a unique opportunity to raise awareness and connect consumers with more sustainable food practices. Chris Spinelli who heads up Partnerships Marketing at Too Good Go notes, "We want businesses to know that you can do good and still experience good business outcomes."

With over 72M downloads, Too Good To Go powers the world's largest marketplace for selling surplus food – all offered at 1/3 the retail price. Their app allows users to purchase unsold food items from local food businesses and pick them up at a designated time and location. The goal is to help food businesses turn a distressed asset (surplus food) into additional revenue and carbon savings while providing affordable food options to consumers. Now operating in 17 countries, Too Good To Go is saving over 6 pounds of food every second and has provided partnering businesses with over \$75M in revenue from food that would have otherwise gone to waste. Innovative companies such as Cellular Agriculture Ltd., a cellular protein company, are using new technologies to reduce food waste and achieve circularity in the manufacturing process. Essentially, a circular economy "keeps materials, products, and services in circulation for as long possible. [It] reduces material use, redesigns materials, products, and services to be less resource intensive, and recaptures "waste" as a resource to manufacture new materials and products."<sup>[15]</sup>

The United Nations Economic Commission for Europe (UNECE) identifies five key components of a circular economy:

	Waste management
$\bigcirc$	Sustainable procurement
	Value chain traceability
	Regulatory standards

Efficiency of trade and logistics chains<sup>163</sup>

Though the updated idea of the circular economy is one of the most promising in agriculture today, preindustrial food production was naturally circular. Virtually every part of an animal was used for food, clothing, or weapons, while the distribution of food was inevitably local.

Similarly, preindustrial societies typically rotated crops and fields regularly. Monocropping, which refers to the repeated cultivation of the same crop on the same piece of land, is a 20th century idea that allowed food production to scale rapidly. Over time, however, monocropping, decreases food diversity, reduces soil nutrients, and exacerbates erosion. The growth in regenerative farming will help rehabilitate soil and farmed land, promoting a more sustainable food system.

#### Packaging

This is the Plastic Age (which is another way of saying it is an era of fossil fuels). Invented in 1907, plastic accelerated industrialisation and globalisation. Plastic is lightweight, relatively inexpensive to produce, and reduces food waste. Customers today, particularly in developed economies, expect a wide variety of fresh produce to be available all the time. In addition, food often travels thousands of miles from the country of origin to the dinner table. Plastic is a main reason why both things are possible.

Unfortunately, plastic also generates negative externalities that contribute both to global pollution and climate emissions. From 1950, annual production of plastic increased nearly 230-fold to reach 460 million tonnes in 2019. Five trillion plastic particles now clog the Earth's waterways.<sup>[17]</sup> The United Nations Environment Program (UNEP) also notes that 36 percent of plastic is used in packaging, including single-use food and beverage packaging. Most of this (85 percent) ends up in landfills or as unregulated waste.<sup>[18]</sup> In 2019, plastic generated 1.8 billion tonnes of greenhouse gas (GHG) emissions, which equates to 3.4 percent of global emissions. Under current conditions, emissions from the plastics lifecycle are set to more than double by 2060, reaching 4.3 billion tonnes of GHG emissions.<sup>[19]</sup> In order to meet the climate challenges, the food industry must find sustainable packaging options that are as safe and durable as plastic. Given that sustainable raw materials can be more expensive than plastic, maintaining mandatory levels of food safety at a competitive price will require extensive innovation.

However, forward-thinking brands such as Notpla, a sustainable packaging company, continue to experiment in this space, with encouraging results:

"I think there's exciting things happening in the packaging space. Mycelium is a really interesting one. Also, the seaweed that we use grows up to a metre a day and, because it's produced in the sea, it doesn't compete with any land crops. It doesn't need fertiliser or fresh water and acts as a carbon sequester in the ocean. So it's crazy good for the environment at the same time as being able to be used for packaging.

Another thing we are trying to do is use the whole part of the plant. We have other products like our seaweed paper, which uses all the waste material that we don't need."

Ella O'Toole Product Manager, Notpla

Nonetheless, we believe this is one of the most promising areas for disrupting the food system in a positive direction. Innovative companies and research institutes continue to experiment with alternatives such as glass containers, stainless steel, rice husk, bamboo, and edible films. Mushroom packaging, which mixes agricultural feedstock with mycelium binding, is also receiving a lot of positive media and investor attention. The company 3M, for example, invested \$60 million USD in Ecovative Design, which focuses not only on mushroom packaging for food but the use of mushroom fibres in construction materials.<sup>[20]</sup> In the United States, to cite another example, Kentucky Fried Chicken (KFC)—one of the most iconic and successful fast-food chains has set a goal of 100 percent compostable packaging by 2025. The company already uses fibre-based cutlery and bamboo buckets. KFC Canada estimates that a full-scale shift to bamboo buckets will eliminate 55 tonnes of plastic waste annually.<sup>[21]</sup>

Digital technology also has a key role to play in ensuring food quality and safety. "Intelligent food packaging" uses information technology to monitor food quality and temperature, track expiration dates, ensure food safety, and track and products across the food chain. The global intelligent packaging market makes up 2 percent of the \$900 billion packaging industry but is expected to rise to 5% by 2030.<sup>[22]</sup>

#### In Summary

Companies and brands can find numerous opportunities to combine technological innovation with consumer outreach to achieve sustainability. Leading food companies will offer appealing and affordable food in ways that reduce waste, improve packaging, and help move communities toward the circular economy. Brand and marketing have a key role to play in reinforcing the message that good food choices are also good climate choices.



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#### • This theme focuses on the benefits of a diverse diet both for human nutrition and a healthy environment.

The sheer amount of food in large grocery stores today is remarkable,<sup>[23]</sup> as are the productivity gains made in the food sector during the industrial era. From 1961 to 2001, crop yields doubled in all regions of the developing world (except Africa).<sup>[24]</sup> Yet, looks in this case are often deceiving. As the IIED (International Institute for Environment & Development) cautions, "what seems like variety, is actually just endless re-engineering, re-combining and repackaging of the same basic, highly processed ingredients."<sup>[25]</sup>

Consumers and producers typically use a small number of food sources. Thirty crops supply 95 percent of the calories that people obtain from food today,<sup>[26]</sup> and the collapse of global agricultural biodiversity is of increasing concern. Of the 391,000 plant species known to science, experts estimate that 5,538 have been used as human food. Yet just three crop species – rice, wheat, and maize – now provide more than 50 percent of the plant-based calories the world consumes.<sup>[27]</sup>

We need to diversify our diets. Different foods have different carbon footprints. Diversifying what we eat can help to reduce carbon emissions, while also improving nutrition and, potentially, global development initiatives in rural areas. Eating a wider variety of plants and plant-based proteins increases vitamin and mineral intake, reduces our carbon footprint, and promotes biodiversity. To diversify, we will need to encourage consumers to experiment with foods currently considered unconventional and even unpalatable. Algae, jellyfish, lionfish, dogfish, and barramundi, for example, are abundant and nutritious, but many consumers used to a Western diet are likely to be put off initially by the idea of eating them. Peer-reviewed research strongly suggests that drivers of consumer food acceptance include food choice motives, familiarity, food neophobia, disgust, and cultural norms, and each of these factors can be difficult to influence or change.<sup>[28]</sup>

Diversification of diets is therefore both a consumer behaviour and brand challenge. Drawing upon tools such as the Blue Food Assessment--an evidence-driven research initiative to encourage the cultivation of marine species for food—can be useful for companies and investors who want to explore sustainable alternatives to the meat-based diet.<sup>[29]</sup> The "protein transition" from diets based on conventional livestock—beef, pork, chicken to sustainable alternatives will require creative thinking from the lab to the marketing department.

Consumers in developed countries have also been normalised to the idea that fruits and vegetables no longer have seasons but are available in bulk all year. This is simply not sustainable, further erodes environmental sustainability, and entrenches monocropping. To take just one example, the popularity of avocado toast led to many farmers rationally making the decision to switch to avocado monocropping. While profitable in the short to medium term, this also resulted in multiple negative externalities including overconsumption of water.<sup>[30]</sup> We need to eat more fruits and vegetables at their harvested peak. Doing so provides maximum flavour and nutrition, while supporting local economies. As Tim Newton at BerryWorld noted, "Growing a crop outside of its natural seasonal window means its yield per area (using conventional farming methods) won't be as good, which is why we work to maximise the local growing seasons with innovative techniques, and we need to educate consumers on that. We have to change the way we think about the produce we consume and understand the importance of eating seasonally where we can, and moving towards the most sustainable and carbonfriendly sources outside of those local seasons to keep healthy produce available year-round."

Government may need to take the lead in incentivising these shifts and investing in basic research. One promising area is in traditional knowledge and food sources and research done in consultation with indigenous communities and small-scale farmers. Taro (Colocasia esculenta), for example, has been an indigenous vegetable staple in Southern Asia for over 9,000 years. Today, it's an under-utilised species but has potential to diversify modern diets while facilitating community development and indigenous autonomy.<sup>[31]</sup>

The drive to adopt more sustainable diets could not be more important. Yet most consumers are not willing to follow an "all-or-nothing" approach. Shifting to sustainable food systems will require brands to work together, and in consultation with communities and consumers, to create a flexible food system that sees a gradual reduction in the consumption of higher risk foods, rather than a full-scale elimination. Higher Steaks, a cultured meat company, embraces the shift toward a more cooperative and sustainable food system:

"We're doing a lot to come together as an industry to drive that change together when it comes particularly to regulatory policy and communications. We're better off doing it together and setting standards together versus alone. I think we're all very much aware of that and working together towards change."

Benjamina Bollag Founder & CEO, Higher Steaks

#### In Summary

A sustainable future of food will be built on more diverse diets. However, brands will need to work hard to make these new and sometimes unusual foods desirable and acceptable to the consumer. Forwardthinking companies will take the opportunity to work with consumers to make food experimentation the fun and responsible choice, while also reminding consumers of the value and taste of seasonal food.



This theme focuses on the need for food system innovation in protein sources and the relationship between current meat production and climate emissions.

The environmental impact of our appetite for meat is clear. Twenty-six percent of the earth's land surface is used for industrialized livestock production, one-third of the planet's arable land is required to grow crops for livestock feed.<sup>[32]</sup> Meat production increases climate emissions due to the methane gas emitted by livestock and the razing of huge tracts of forest land to accommodate ever-expanding herds.<sup>[33]</sup> One interviewee at Huel, a plantbased supplements company, emphasized the tensions inherent in trying to shift away from large-scale livestock farming: "Some governments in Europe want to close livestock farms or reduce animals per farm to meet environmental targets. The farming community is in uproar, they are reliant on their farms for their livelihoods. It's a standoff. But ultimately, how can we meet targets such as nitrogen reductions unless we farm less animals?"

Jessica Sansom Sustainability Director, Huel



Yet while veganism and vegetarianism will always appeal to some consumers, meat consumption is expected to rise, driven largely by changing food preferences in newly developed countries and population growth. Growth in global consumption of meat proteins over the next decade is projected to increase 14 percent by 2030 Protein availability from beef, pork, poultry, and sheep meat is projected to grow 5.9 percent, 13.1 percent, 17.8 percent, and 15.7 percent, respectively, by 2030.<sup>[34]</sup>

Some companies, such as Enough, a food tech company who make sustainable sources of food protein, have had early success in transitioning to protein alternatives:

"At Enough we grow protein in a manner which is more efficient than the animal is, therefore lower cost than the animal and does not have some of the negative externalities of the animal. In that context, we see our role as being one small part of making the future of food and the future of protein more sustainable."



Meat alternatives that leverage sustainable technologies while maintaining the taste, mouth feel, texture, and smell of meat are key to achieving sustainable agriculture. Meat alternatives have been on the shelves for many years but are currently experiencing a significant investment upswing.<sup>[35]</sup>

Awareness among mainstream consumers on the existence of these products will likely come from brands. A study by University of Bath found that consumers found cultured meat less appealing when it was framed as a cutting-edge, high-tech product than when it was presented

as a solution to societal problems.[36] Plant-based alternatives have also expanded beyond meat products to include milk, cheese, yoghurt, and eggs. We are a long way from the lintel burgers and "hippie cafes" of the 1970s. Growth opportunities in plant-based meat substitutes lie in creating greater choice for the consumer and in branding/marketing campaigns that attract casual consumers in addition to committed vegetarians and vegans. Until recently plant-based alternatives were available as premium or exclusive brands, but the need and opportunity are to create massmarket plant-based alternatives that are available and relevant to all consumers at all price points.

We are also seeing a shift towards eating whole food plant-based proteins that require less processing. This is promising in terms of human health and consumer preference. The definition of health has evolved over the last decade or so, with more consumers expressing concerns about ultra-high processed foods. The Covid-19 pandemic further encouraged consumers to re-evaluate food preferences in terms of prioritising their health. Michael Corlett from Deliciously Ella, a plant-based food and wellness platform, told us:

"The pandemic has accelerated consumers choosing plant-based foods. When you interview consumers directly, they are now saying they're choosing to eat plantbased for their health. The environment and animal welfare remain really important, as does food provenance, but health is now the number one reason. Regardless, plant-based alternatives have to taste great. People who are reluctant to eat more plant-based foods often believe that plantbased food isn't going to taste as nice or be as filling a meal. That false perception is still very much alive."

Michael Corlett Strategy & Insight Director, Deliciously Ella

Cultivated cuisine is another promising innovation that could reduce climate emissions while improving human health and animal welfare. Cultivated meat, also known as cultured meat, is actual meat produced in a lab by cultivating animal cells. The bio-production method eliminates the need to raise and farm animals for food. Cultivated meat has the same cellular structure as animal tissues, thus mimicking the taste and nutritional profile of conventional meat.<sup>[37]</sup> This is important for consumers who still want meat in their diets even if it is produced in innovative ways:

"If cultured meat has the same taste and same nutritional profile, the same emotional response as traditional meat, it purely is for people who don't want to reduce their

#### meat intake. That's the 70% as opposed to those who have a sense of ethics when it comes to food."

CEO & Co Founder, Cellular Agriculture

From a health perspective, cultured meat delivers the same nutritional value and taste as regular meat. The research challenge is figuring out how to scale cultivated cuisine such that it becomes affordable as a mainstream alternative for the consumer. The environmental impact of cultivated cuisine on a large scale—which will require a lot of lab space and electricity—also needs further investigation. This is why we currently believe that the future of meat is best positioned as a smart combination of traditional livestock and cultivated cuisine, rather than as an either-or proposition.

Last, but not least, we must consider what we call the "crunchy critters." Insects have recently gained a reputation for being a sustainable protein-rich superfood in the West and articles about mass production of "grasshopper snacks" are clickbait. Mass production of insects for food would, in fact, be much less environmentally damaging than the ongoing cultivation of meat. The 25 kilograms of grass it takes to produce a kilogram of beef could produce 10 times the amount of insect protein.<sup>[38]</sup> However, while insects have been touted as a sustainable alternative protein, the evidence indicates that their production may not be efficient at scale.<sup>[39]</sup> They require highly-energy-intensive forms of processing to get them into formats that are acceptable to consumers.

Although insects remain a traditional food in Africa, Asia, and Latin America, we anticipate friction when it comes to large-scale consumer adoption of insect protein in the West.

In general, insects are the least appealing alternative protein, with most people preferring cultivated meat.<sup>[40]</sup>

Food manufacturers, with help from recipe developers and food scientists, will need to be creative in finding ways to persuade reluctant consumers to give crunchy critters a try. Possibilities include consuming insects in powdered form, whether in chips or as protein powder. Reinforcing the link between "food curiosity," better health, and a cleaner planet is likely key to bringing the customer along the journey. We also believe that the biggest opportunity for insect protein is in livestock food, helping reduce dependency on soy and therefore deforestation.

#### In Summary

The brand opportunity is to develop new and affordable sources of protein while also nudging the consumer to consider alternatives such as cultivated cuisine and even insects. Brands will also need to ensure that meat alternatives are tasty and appealing, lest these be perceived by consumers as down market or unappetizing.

The scale of the opportunity is immense. Rather than think of it as a series of niche opportunities, the requirement here is to create an alternative brand ecosystem that is as huge and diverse and the current global market for meat-oriented products. It's a shift that's bigger, even, than the shift from horse-drawn carriages to the car, and with a more positive environmental outcome.

#### FUTURE OF OUR FOOD SYSTEM

# RANSPARENCY

#### This theme addresses the need for transparency in labelling and a commitment to providing accessible information to the consumer at the point of sale.

Ensuring supply chain transparency is increasingly important to the future of the food system. Propelled by both the recent explosion in social media and digital apps and an expectation that corporations will be responsive to society, consumers want to know where their food comes from, how it was cultivated, and how it got to the grocery store. Indeed, one research study shows that twothirds of shoppers would switch from a brand they usually buy to another brand that provides more in-depth product information, beyond routine nutrition facts.<sup>[41]</sup>

Food producers can improve transparency through clear labelling and certifications. Labels should provide information not only on nutrition and allergens, but include accessible and evidenced metrics for animal welfare, fair trade, sustainability. Certifications need to be independent and backed-up by legitimate peer-reviewed research. Consumers also want to know about the climate impact of their food choices through Carbon Labelling.

New technologies such as blockchain can improve supply chains and increase consumer confidence. Carrefour Group is one outstanding example of a company that has harnessed the power of technology. It uses blockchain to store data on every exchange between users (producers, processors, and distributors) along the food chain. Consumers can scan a QR code on their smartphones and immediately access real-time information on the eggs they are purchasing.<sup>[42]</sup> Digital technology enables producers to provide customers with reliable and transparent information on product sustainability and ethics at the point of sale. The most responsive companies will be able to share data from the inside of the supply chain, which in turn may nudge other companies to reassess the sustainability of their supply chains and improve transparency. Contra the old saying, in the case of food today, many consumers want to know how the sausage is made.

#### In Summary

Innovative companies will harness the power of new technologies to provide verifiable information about nutrition and food provenance to the consumer at the point of sale. There is a clear B2B brand opportunity to create the systems and processes that facilitate transparent supply chain management, but there is a clear B2C opportunity in allowing consumers to gain insight into the provenance and ethics of their food, coffees, and wine simply by scanning a QR code or NFC tag.





#### FUTURE OF OUR FOOD SYSTEM



This theme considers the cost-of-living crisis, which is having a negative effect on household food budgets, food security, and families.

The current cost of living crisis is squeezing household budgets globally. In Britain, food prices increased by 16.8 percent in the period between December 2021 – December 2022.<sup>[43]</sup> The increased cost of food puts a strain on consumers, while food banks have seen a 91 percent rise in the demand for assistance.<sup>[44]</sup> Helen Bass, Global Head of Marketing and Insights at Tate & Lyle, emphasises the challenge of equitable access to affordable and nutritious food: "So, I think affordability is going to be key, not just in a cost-of-living crisis, but on-going. Currently sustainability claims, similar to health claims, can lead to higher prices for consumers. In tight financial circumstances these can be difficult for the consumer to justify. We all want to buy sustainable products. We all want to buy products that are healthy and nutritious. But not everyone has the opportunity to do that. We need to change this for all to be able to access affordable. sustainable nutrition."



Cost

Helen Bass Global Head of Marketing and Insights, Tate & Lyle Yet these sobering statistics hide an important paradox. In actual terms, UK food inflation has been at an all-time low over the last two or three decades. Food inflation averaged 2.55 percent from 1989 to 2022, meaning that Britons spend about 8 percent of their income on food today, compared to a hefty 33 percent in 1957.<sup>[45]</sup>

The Green Revolution that began in the 1960s made calorie-dense foods filled with wheat, sugar, and vegetable fats cheap and abundant. According to a National Food Strategy report, "the average Brit now consumes five times the volume of crisps than in 1972."<sup>[46]</sup> The Green Revolution set high standards for productivity and lowered the relative cost of food dramatically. As James Collier at Huel notes, achieving sustainability and commercial viability continues to pose a challenge for forward-thinking brands:

"What is the point of us having, objectively, the best, superior product on the planet if nobody buys it, because it is too expensive? We've got the most nutritious product, we've got the most sustainable product, but if nobody hears about it and if it is not commercially viable, then we've failed in what we do. So, it is getting the right balance, so the marketing message has to be real while being honest."



James Collier Co Founder & Head of Sustainable Nutrition, Huel However, this approach is no longer sustainable. The challenge is to shift to a sustainable model while also ensuring the farmers can make a profit and maintain their businesses. This requires innovation on not only the supply side, but on the demand side, as Michael Corlett at Deliciously Ella notes:

"Food prices have been artificially suppressed for too long. We now face a difficult readjustment on what we can afford to buy and how regularly we can afford to buy it. Conflict, economy, and climate have coalesced to create the perfect storm - shattering the markets' ability to continue suppressing food price inflation."

Nichael Corlett Strategy & Insight Director, Deliciously Ella

Despite foods being artificially more affordable, the cost-of-living crisis has plunged millions of families into food poverty. We are now in a perfect storm where prices do not reflect the true cost of food but remain unaffordable to many. The false sense of food affordability held over from the past combined with the current cost of living crisis means that businesses must reconfigure how people access food and how technology can be deployed to support a fairer and more sustainable food system. This is particularly important in food deserts where access to affordable food is critically important but hard to come by. This requires a need to rethink local food supply in support of affordability. Feeding Britain, a UK based charity, that works to alleviate hunger and food poverty has been on the front lines of responding to this crisis:

"We're trying to repurpose a whole fleet of vehicles - be they double decker buses, library buses, even ice cream vans, old ambulance vehicles, whatever they may be - so we can bring this affordable food, plus wraparound services, to the heart of the communities and the estates and the neighbourhoods where they're most needed and people struggle most to access them. That applies equally in rural and urban settings, we've found."

Andrew Forsey National Director, Feeding Britain

#### In Summary

The brand opportunity is to prioritise sustainability across the food chain while also ensuring affordability and equitable access to food. This can't only be delivered by small-scale startups, it needs a level of massmarket industrialisation and logistics reform to ensure that good food can be delivered to every consumer at a fair, affordable price. While the cost-of-living crisis is real, supporting consumers to understand the true cost—not only financial but social and environmental—of easy food access will be paramount.



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#### This theme encompasses the relationship between the food system and global justice with respect to food access and health.

Our food system needs to address local, national, and global food inequality. United Nations Sustainable Development Goals 2 and 3 prioritize zero hunger and good health and well-being, respectively. The covid-19 pandemic has also made health a top priority. One-third of consumers now specifically shop for products that target their personal health needs.<sup>[47]</sup> Sixty percent of consumers are looking for food and beverages to support them in achieving good immune health.<sup>[48]</sup>

In terms of brand messaging, a focus on health sets out a readily understood benefit that can be perceived as advantageous for those seeking it and reassuring for consumers who might otherwise associate food innovation with ultraprocessed foods from previous stages of food industrialisation.

"In helping people to adopt new diets we focus our conversations very much on benefits. So, if you do consume food in this way, you're going to feel better, and you're going to be healthier"

Jessica Sansom Sustainability Director, Huel

The low prices of food that are high in saturated fat, salt, and sugar (HFSS) contribute to a health crisis wherein both obesity and malnourishment thrive. Research has found that calorie-dense foods that are low in water content and have insoluble fibre interfere with feedback mechanisms of our appetite.<sup>[49]</sup> This means that the feeling of fullness takes longer to be conveyed by our hormones.<sup>[50]</sup>

Additionally, HFSS foods are cheaper to manufacture as the Green Revolution made ingredients like refined sugar, flour, and vegetable oil abundant. These caloriedense foods lack the nutrition and nourishment to support our health. Eighty-five percent of the manufactured food products sold in the UK are unsuitable to be marketed to children as they're deemed too unhealthy.<sup>[51]</sup> We need to have healthy foods available at affordable prices.

The Covid-19 pandemic has made many people more conscious of their health, and caused a rise in demand for foods that help boost immunity. Active consumers are looking for nutrition that supports a range of wellness concerns, from gut health to mental acuity and immune health.

Products claiming immune-boosting benefits, nutrient-rich ingredients and fortified foods are top of the shopping list. Research by GlobalData found that around a third of consumers aged between 18-34 say mood boosting and relaxation claims are key to their purchasing decisions in fast-moving consumer goods (FMCG) products.<sup>[52]</sup>

New technologies are now making it possible to explore genetic metabolic types to deliver more relevant dietary guidance and nutritional services. Nutrigenomics (Nutrigenomics examines the relationship between what we eat and our genes), increasingly enables personalised nutrition,<sup>[53]</sup> though brands may struggle to position personalised products in a mass market at affordable prices. Should nutrigenomics become a luxury item, available only to the wealthy, achievement of the UN Sustainable Development Goals (#2 and 3) becomes much more politically problematic.

#### In Summary

The brand opportunity will be for companies to practice social responsibility in food access while maintaining profitability and leveraging the power of nutrigenomics and other innovative technologies to improve human health. There's clear market opportunity here for brands to continue to elevate some consumers' concept of 'healthy eating' from beyond being well or avoiding illness towards delivering improved personal performance, but in a way that's 'built-in' to their diet rather than perceived and delivered in a way that is 'supplemental'.



This theme reflects the role that food can play in fostering crosscultural understanding and encouraging consumer willingness to try new cuisines.

Social media has exposed us to international cuisines and different ways of cooking. The pandemic also influenced the type of food content we consume and create on social media. Content has shifted from restaurant food reviews to at-home cooking, and people are increasingly turning to social media for inspiration to find recipes.<sup>[54]</sup>

Research shows that Gen Z are much more likely than older generations to be inspired by social media to cook international cuisines. Also, one unanticipated result of both the costof-living crisis and Covid-19 lockdowns is that many people feel more confident with cooking from scratch and preparing new dishes that stretch their culinary skills. In fact, one study found that 3 of every 4 Gen Z-ers have cooked their own meals at least five times a week since the beginning of the pandemic for financial security reasons.<sup>[55]</sup> The surge of food content – particularly from ethnic cuisines – has also fuelled demand for more authentic ingredients and traditions with modern and unusual twists. This has given rise to the experimentation with unusual flavours and formats, where seemingly at-odds-foods are brought together to create new and unexpected products. For example, Guinness recently released their own cold brew coffee beer.<sup>[56]</sup> Brave Foods creates cereals and snacks made from chickpeas.<sup>[57]</sup> Their cookies and cream flavoured chickpeas might seem an odd combination to many, but suggests the kind of creative thinking that is possible.

#### In Summary

The brand opportunity is to identify the narratives and messaging that will positively impact consumers' attitudes towards food experimentation and willingness to try new food items. Effective marketing will require careful research, creativity, and cultural sensitivity. Brands that identify effective and culturally resonant ways to encourage consumer uptake of a diverse diet will be better placed to meet the sustainability challenge.

# The ingredients for success

## Summary & Implications

This comprehensive report has introduced seven significant challenges that must be addressed to shift the global food system to a sustainable and equitable basis: sustainability, food diversity, innovation, transparency, cost, wellbeing, and experimentation.

The challenges are profound and the amount of time available to address the connection between the food system and anthropogenic climate change is dwindling rapidly. However, the global food system has proven time and again to be responsive and innovative.

From the early 20th era, disruption of refrigeration through the Green Revolution to precision agriculture, stakeholders both large and small in this sector find ways to adapt, while meeting the demands of regulators, consumers, and international organisations.

#### Sustainability is a table stake

For your brand to have a spot at the table it must have a robust sustainability agenda and strategy at the bare minimum. However, this should not be used to drive distinction for the brand, and it certainly shouldn't become the responsibility of your consumers to navigate and understand. Sustainability delivers commercial results and needs to be prioritised.

## Make it normal

Whilst the future will demand more diverse diets, brands will need to work hard on making these new foods desirable and acceptable. We know that we tend to eat based on what we perceive to be both normal and nice. Brands will play a critical role in bridging this gap.

#### Create brand ecosystems

The drive to adopt more sustainable diets couldn't be more important. But most consumers aren't willing to follow an "all-ornothing" approach. This will require brands across the food system to work together to create a flexible food system that sees a gradual reduction (not rapid elimination) of higher risk foods, as well as businesses across the supply chain to work together for the greater good.



While brands will continue to compete in the global marketplace, the food system will likely become more coordinated, cooperative, and flexible in gradually shifting from highly processed food to a diverse menu of nutritious and innovative options. Brands have extraordinary opportunities to work with consumers to nudge them in the direction of healthier, cleaner, and environmentally sound food and packaging choices.

We intend to continue this research project and to share our findings broadly to support the shift to a 21st century food system that is clean, sustainable, secure, innovative, and equitable. We welcome your feedback and ongoing discussions and plan to develop our thinking further incorporating a global view.

# About Re

# **Re** is a global brand-led experience design business and part of **M&C SAATCHI GROUP**



At Re, we are under the guidance of a clear and powerful principle - design to connect. This permeates every aspect of what we do as a business. We help our clients develop a story they can tell, tools they can use, and experiences that engage people in their world.

Our team of design thinkers and makers covers the globe. We believe design is more than just what you see. It influences brand decisions and helps to develop those solid critical connections.

Whether your brand is starting-up or scalingup, or looking to transform, refresh or discover your style, Re's team of experts offers innovative solutions. Find out more about our unique services today. We can help you bridge the gap between your brand and experience and support you in your ambitions to scale. Stay tuned for more content in our food system series where we will showcase some of our ideas for the future of food.

In the meantime, if you'd like to find out more about the work we do and how we can help you build your brand for success please contact;

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To learn more about Re: re.design

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