150 Sainsbury's Est. 1869

Sainsbury's

Future of Food Report

Foreword

Claire Hughes,
Head of Quality and Innovation, Sainsbury's

Since its creation 150 years ago, Sainsbury's has been a pioneer of innovation and a trailblazer for introducing new food in the UK. Starting with the 'humble stick of butter', and we now offer thousands of products available today.

We have always been at the forefront of introducing new food to the nation, turning once 'niche' items into everyday products. From introducing speciality cheeses such as Gorgonzola and Camembert in 1880, to becoming the first British supermarket to introduce the avocado in 1962, which we now sell more of than oranges. In 1969, fresh croissants were no longer just a thing of speciality bakeries when they were introduced to Sainsbury's stores, while 1972 saw a range of good-quality wines hit the shelves – ready to be picked up alongside a pint of milk.

Sainsbury's has also been central to informing how we think about the food we eat today by adding nutritional information to products in 1961 – and becoming the first to introduce the 'traffic light' healthy eating system to the front of packaging in 2005.

Not only has Sainsbury's pioneered what we eat, the supermarket has also been a major driver behind how we source food. From being the UK's leading retailer of RSPCA assured products, to setting up innovative farming groups and establishing a sustainable supply chain today and into the future.

The world has changed immeasurably over the last 150 years and our eating habits, technology and the way we source our food has continuously evolved alongside it.

By looking at the macro trends, scientific studies and heightened environmental awareness already developing today, we can start to explore how our food could start to change in the future and what that might mean for our customers.

This Future of Food Report paints a picture of life in 2025, 2050 and 2169, showing the potential role of food for our customers - and the potential role of our customers for our food - in the next 150 years.

In five years' time, alongside medication, our doctors could be incorporating food advice as health prevention techniques to help alleviate our ailments. Sainsbury's has already started to help out customers with boosting nutrients through the launch of our Super Mushrooms - containing Vitamin D and B12 - and there is great potential for bio-fortification foods to become much more common on our shelves.

Driven by unprecedented awareness of animal welfare, health concerns and eco-anxiety, more of us than ever could be putting the planet first when writing our shopping list. It's expected that a quarter of all British people will be vegetarian in 2025 (up from one in eight Britons today) and half of us will identify as flexitarians (up from fifth today). Sainsbury's alone has already seen a 24% increase in customers searching for vegan products online, and a 65% increase in sales of plant-based products year-on-year, as customers increasingly consider a vegan, vegetarian or flexitarian lifestyle.

In thirty years, jellyfish and other 'invasive species' could be found on the fish counter as recent research has found them to be full of nutrients and vitamins. And we could even be introducing a 'lab-grown' aisle, where people can pick up cultured-meats and kits to grow meat at home. Meat, as we know it today, could instead start to become a luxury product.

We could start to see a very different food landscape in 150 years', as scientists may well be farming in space and sending back their learnings to us on Earth. This would be instrumental to us being able to farm on land which was previously barren - providing us with seasonal produce all year round.

With developments in technology happening every day there are endless possibilities for how we could be consuming our food in the future. It's likely that we'll be consuming our key nutrients through implants. While nutrition patches and drips could replace our day-to-day intake, traditional celebrations - birthdays, family occasions - could be bigger and better than ever before, with the aesthetics of food strengthening the bonds of community.

Sainsbury's will continue to play a crucial role in expanding the nation's diets and palates, over the next 150 years.

Illustration by: **Margarita Mitrovic**

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Scenario 2025

It's the May day bank holiday weekend and the sun is shining in Leeds.

Julia has just returned home to her parents from university in London where she is studying her degree in eco-health.

Tomorrow is her mother's 60th birthday and she's planning to cook a meal for all the family. She opens up her meal planner app and asks it to update the quantities for seven, taking into account her sister's gluten intolerance, her brother's love of Italian and her grandparents' MIND diet - designed to prevent dementia and loss of brain function as you age.

She smiles gleefully at the thought of showing her dad that the entirely vegan meal has surpassed daily recommended nutrition guidelines. Secretly he would prefer to eat steak, but she's determined that the whole family follow a more flexitarian diet [1].

The app alerts her that the order has been placed at the local supermarket, and will be ready for collection at 1pm. At the supermarket, Julia makes her way to the pick-up point through the vegetable area. Micro greens are lapping up the LED light and water softly dripping across the hydroponic shelving stack growing leafy vegetables all year round.

On the way back, she briefly stops by the supermarket's kitchen demo area to see a workshop led by her local healthcare centre. The former local doctor, who has become something of a celebrated community chef, is stirring a sizzling wok of moringa leaves while discussing its suitability to help manage diabetes, as well as benefits for those lacking in essential nutrients. Julia knows from her studies that there is a huge amount of research going into growing moringa as a global crop, which can be ground and made into a low-glycemic, high-nutrient alternative to flour.

Back in the kitchen, she sets out the ingredients. On the menu are a root vegetable soup with seaweed and hemp seeds, bread made with a dash of lichen, a recent addition to the supermarket shelves, as well as Nana's favourite: locally brewed herbal kombucha, which she loves because 'nothing else keeps her quite as regular'.

[1] *https://www.healthline.com/nutrition/mind-diet*

Planet-friendly food

James Wong, *Plant Scientist:*

"When Sainsbury's first launched in 1869 the British diet was actually very diverse and incorporated lots of ingredients and foods we don't see today. When rationing was introduced in 1940 diets simplified to include core ingredients that provided sustenance, and with that we witnessed a decline in the varieties of some ingredients. However, what we are seeing now - especially with the explosion of plant-based foods - is that diversity in food returning with the British diet now including ancient crops like quinoa and South-East Asian staples such as Jackfruit.

With that increasing variety in diets comes more understanding of where our food comes from and a deeper appreciation of food production."

What we eat, how it is grown, produced, packaged, transported and sold has implications not just for human health but for natural habitats, animal life and biodiversity, for water consumption and desertification, for soil fertility and eutrophication, for pollution and greenhouse gases.

Planet-friendly food is about the growing public awareness of how our food system impacts the environment and the willingness of people to do what they can do through their food choices.

According to scientists, diet is the single biggest way for people to reduce their environmental impact, even more so than how they travel. Following a more plant-rich diet helps reduce excessive nutrient runoff from agricultural areas into rivers and lakes, land and water use as well as greenhouse gases [2].

As the global trend for meat consumption increases [3], Britons are changing their diets to eating less meat. Today, flexitarians, who are those actively reducing their meat consumption, make up a fifth of Britons, while vegetarians account for an eighth of the national population. Vegans, those who eat no meat, eggs or animal products, are still in the minority at around 600,000 in the UK [4].
However, with the rise of an ecologically aware new generation, driven by health concerns and environmental determination, vegetarians (including vegans) look set to make up a quarter of British people in 2025, and **flexitarians** just under half of all UK consumers [5].

Currently, more of us are looking to eat seasonally and more fresh produce. With fewer food miles, promised freshness and even the chance to get to know who has grown your food, seasonal and local can offer low environmental impact and support local economies (particularly when renewable energy is used for production).

Chef Tom Hunt's Bristol tapas restaurant, Poco, sources almost exclusively within a 50-mile-radius, working with several Bristol community growing projects. He promotes zero-waste "root-to-fruit" vegetable cookery, which by using the roots, leaves, flowers and skins, as well as the more obviously edible parts, can reduce the cost of using pricier local, sustainable vegetables. Chef's at Somerset's Ethicurean or Monmouthshire's Whitebrook, which at the height of summer

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A flexitarian diet *is one that is predominantly plant-based with the occasional inclusion of meat and other animal products. Also known as semi, casual or part-time vegetarian.*

[2] Reducing food's environmental impacts through producers and consumers, Authors: J. Poore, T. Nemecek, Science 360,June 2018

[3] FAO's Animal Production and Health Division: Meat and Meat Products http://www.fao.org/ag/againfo/themes/en/ meat/home.html

[4] www.vegansociety.com/news/media/statistics

[5] The Future of Food 2040 report, National Farmers Union (NFU), 2017

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Hydroponics *is a subset of hydroculture, which is a method of growing plants without soil by using mineral nutrient solutions in water.*

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sources up to 90% of its produce from within 12 miles, work in a similar way.

While this approach has been the mainstay of the farmers market, the rise of hydroponics systems could begin to revolutionise what it means to eat truly fresh food. **Hydroponically grown plants,** cultivated without soil, can be grown in spaces that would otherwise be unused - underground tunnels, disused warehouses etc., offering new opportunities for urban food growing. The technology is also twice as space efficient than conventional farming, requires fewer inputs of agrochemicals like pesticides and uses significantly less water.

When powered by LED lights and renewable energy, the environmental and cost savings make it an attractive investment for catering businesses, even today. IKEA is one such company, which early in 2019, announced a pilot to cultivate hydroponic lettuce on site to supply its restaurants in Germany and Sweden. The hydroponic systems of German technology company InFarm are already present in 137 restaurants and stores across Europe. Meanwhile, hydroponic growing is on the rise in the do-it-at-home market, with brands such as Seed Pantry and IKEA offering plug-and-play kits.

By 2025 we could begin to see a rise in on-site cultivation of herbs, micro-greens, salads and shoots, be they vertical or rooftop growing, starting to feature in homes, at restaurants, canteens and supermarkets.

This will offer a sprinkling of supplementary local produce - pea, radish and sunflower shoots, spicy garlic chives and other quick-growing varieties - as a fresh and tasty addition to farm-grown food, ready to pick direct from the kitchen.

The consolidation of **environmental footprinting apps** will also help make our food planet-friendly in 2025 by providing much more clarity to customers about the biggest impacts of our food. Integration of these apps into ones more widely used such as Google Maps, will provide accurate, tailored information to customers - whether they be interested in carbon, calories or chemicals - cutting through the complexity and delivering personalised information. With all the information in one place, making the right choices for the health of the planet will be far easier for both retailers and their consumers.

Swiss-technology firm Eaternity already supports caterers and restaurants by enabling them to calculate the carbon footprint of the meals they serve. This means that not only can they manage their environmental performance, but also inform customers of climate-friendly meal options. The software evaluates the carbon footprint of ingredients, including how they are grown and transported. Eaternity estimates that its partner restaurants have served more than 25,000 climate-friendly meals to-date, representing a saving of more than 21 tonnes of CO2 emissions.

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Environmentalist apps or Green Lifestyle apps *are designed to help people live a more eco-conscious life with decisions around eating, travelling, shopping, etc.*

Dr Polly Russell,
Food Historian:

“The latest food developments may appear completely new but very often they are just the latest iterations of trends which emerged in the past thanks to a range of economic, social and political influences. The current search for alternative proteins - beyond traditional meat and fish - is one such trend. In the late nineteenth century, for instance, scientists like Baron Von Liebig sought to feed expanding industrial populations by developing pioneering processing technology to produce “liquid beef” (products we know as stock cubes and brands like Bovril).

“During the Second World War when key foods like tea, butter and sugar were rationed, ensuring sufficient protein in the population’s diet was a challenge for the government and for the housewife. As a public service and a means of building customer loyalty, Sainsbury’s ran a series of newspaper and radio advertising campaigns called “Chat about Cheese” advising the housewife how best to cope with rations and provide valuable protein sources for their families. “If your wartime food sometimes lacks flavour,” stated one advert, “Cheese it!’.

Adverts encouraged customers to cook with new ingredients or with familiar ingredients in new ways. “‘Don’t be afraid to cook cheese”, ran one advert, “People who haven’t tried it sometimes think that cooked cheese is indigestible but medical science - and experience - disprove this’. And in case men, used to a meat-heavy diet, complained, Sainsbury’s offered a practical solution; housewives were instructed not to grate cheese for cooking but to shred it with a knife – ‘It keeps the flavour better and gives you something to bite on in the dish – a real meal for a man’.”

Beyond meat and fish

Claire Hughes,
Head of Quality and Innovation, Sainsbury's:

"In the last 18 months we have introduced over 100 alternative protein products led by our Love Your Veg range. However, we know that we have a role to play in expanding the nation's diets as the current foods we eat aren't sustainable for a global population that will increase by 50 percent in the next 30 years."

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Plant-based alternatives *that aim to mimic the flavour and texture of animal products are becoming increasingly popular and diverse. These are also known as 'mock/faux/vegan' meat, dairy or fish.*

Traditional protein for human consumption comes from meat and fish. However, as food production faces multiple limiting factors for land, water and energy, and as environmental impacts mount, scientists are calling for a change in our diets and the way we consume our protein.

The non-traditional or alternative proteins market ($4.2 billion in 2016) is expected to grow more than 25 per cent by 2025. Throughout 2016 to 2019, dozens of companies were launched, with many attracting high profile investment.

One of these to take the industry by storm was jackfruit - first brought to the UK retail market by Sainsbury's in January 2018 in a smoky barbeque pulled form, the plant-based alternative now features in over nine products on its shelves, from lunch-time wraps to a vegan quarter-pounder. The next innovation focus for Sainsbury's is on incorporating banana blossom, a plant-based fish-like alternative to range of prepared meals.

Mushroom-based products, algae milk, seaweed caviar and insects are just some of the increasingly sophisticated options whetting investor appetite. Sainsbury's alone has seen a 24% increase in customers searching for vegan products online, and a 65% increase in sales of plant-based products year-on-year, as customers increasingly consider a vegan, vegetarian or flexitarian lifestyle.

De Krekerij, a Dutch start-up based in Rotterdam, produces a number of cricket and grasshopper-based products, processing the **insects** as raw ingredients with flour and other vegetable bases to make its signature cricket burger, and a nutty flavoured cricket-based pasta to demonstrate its versatility. Sainsbury's was also the first UK supermarket to introduce snack-packs of insects through the brand, Eat Grub.

But growing interest in plant-based proteins is flagging up another consideration. Though there are more than 50,000 edible plants in the world, still nearly two-thirds of our food comes from just four crops – wheat, maize, rice and soybean [6].

According to the FAO, since the 1900s, some 75 per cent of plant genetic diversity has been lost as global markets favour genetically uniform, high-yielding varieties over indigenous varieties [7]. By putting all our eggs in one basket, we are at risk

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Although consuming ***insects*** *as food might seem strange from the European or North American point of view, according to the FAO (United Nations Food and Agriculture Organisation) estimates that about one third of the Earth's population, or more than 2 billion people, eat insects as part of their regular diet.*

"75%

of what the world eats comes from just twelve crops and five animal species," ***April Redmond****, global VP, Knorr*

[6] *www.cffresearch.org*

[7] *www.fao.org/3/y5609e/y5609e02.htm*

of volatility in the commodity markets, crop pests, disease and the impacts of climate change.

At the same time, chefs such as Senegal-based Pierre Thiam and Danish star Rene Redzepi are distinguishing themselves through novelty and experimentation, finding culinary delights in unlikely places, seeking out ancient foods such as lichen or incorporating neglected grains such as fonio. This is helping open up new markets for forgotten crops and driving research and investment in agro-biodiversity.

Crops for the Future, the world's first research centre dedicated to underutilised crops, is looking to tackle this issue. It is exploring the nutritional and processing potential for underutilised crops including moringa, kedondong and bambara groundnut. Fast-forward to 2025 and many of these could well be gracing the aisles of the supermarket as ingredients in both sweet and savoury dishes.

Alternative proteins are also offering another possible approach by changing what livestock eat in 2025. Around 97 per cent of global soya crops are eaten by livestock, and if not sustainably sourced, can drive deforestation.

Sainsbury's has committed to ensuring that its own brand products do not contribute to deforestation by 2020, including soy, and works with a range of organisations and initiatives to achieve this.

- Insect and **algae** protein sources represent a potential viable, sustainable and radically less resource-intensive alternative to conventional livestock feed.

Dutch university Wageningen is currently working with dairy farm, Kelstein, and algae grower, Algae Food & Fuel, to trial how algae from residue streams from a biogas plant might be used as a feed, mineral lick or as a supplement for cattle. Meanwhile, free-range hens, sold in Sainsbury's under the "Woodland" range, are fed on an algae-rich diet resulting in eggs that are packed with omega-3, bringing added nutritional benefits for customers. By 2025, it is likely we will feed ourselves, and potentially our livestock, a much broader range of planet-friendly proteins in the UK, in a way that helps mitigate deforestation, supports biodiversity and readdresses the balance of our diets.

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Algae, *specifically microalgae (unicellular microscopic algae, typically found in freshwater and marine systems) like spirulina, chlorella and dunaliella are increasingly being researched and introduced as a nutritious food for both humans and livestock, due to their high content in protein, minerals and other nutritional benefits.*

Food-as-medicine

James Wong, *Plant Scientist:*

"We are seeing increased interest in the functional food trend - where people are drawn to foods with perceived health benefits. However, this is balanced with increasing mistrust for health advice given, as much of it is based on fear rather than scientific fact. This has led to polarisation in diets - with some advocating a caveman or Paleo diet, while others convinced that veganism is best for your health.

The rise in obesity and associated degenerative diseases has been driven by a complex range of factors, some of which we are only beginning to understand. However, what it has undoubtedly sparked is a growing interest in the impact diet has on health and in particular is the functional benefits food can have above and beyond their vitamin and mineral content."

Unhealthy diets are responsible for 11 million preventable deaths globally per year, more even than smoking tobacco [8]. As a result, globally, around 70 per cent of consumers are actively making dietary choices to help prevent conditions such as obesity, diabetes and high cholesterol [9]. Limiting salt, sugar and trans-fats is important, according to new research, but even more so is ensuring we get enough of the vitamins, minerals and micronutrients that contribute to wellbeing and help fight chronic diseases.

Recent scientific research suggests that some foodstuffs have the potential to boost brain-power, promote gut health, to regulate mood and balance hormones. As individuals increasingly strive to improve their performance in their personal and professional lives, interest has grown in extracts, powders and food derivatives with health-enhancing qualities.

The idea of food-as-medicine has been around for some time. Medicine and diet, from the medieval period onwards, were seen as inseparable to ensure good health. This link was well known to our ancestors but was forgotten when medicine was professionalised outside the domestic setting.

Well into the nineteenth century manuscript cookery books and many household manuals, published by women, included not only cooking 'receipts' but medical remedies, known as 'recipes'.

The shift now is blurring the boundaries between medical institutions and food businesses in the public imagination. The thinking in preventative medicine through food and nutrition is now beginning to incorporate diet into healthcare, rather than relying solely on medications, and food businesses are beginning to support customers in making healthy choices, in addition to offering products such as bio-fortified foods with potential health benefits.

Sainsbury's bio-fortified foods such as chestnut Super Mushrooms and salmon, are developed especially to support consumers in getting the balance of the extra nutrients they need. The salmon, fed a bespoke diet, is specifically formulated to deliver the weekly required intake of particular long chain omega 3 fatty acids (EPA and DHA) in one portion, while 100g of the mushrooms delivers 100% of consumers' Vitamin D and B12 needs. At Sainsbury's, there is great potential to take this one step further and include these super

www.fooddive.com, food industry newsletter:

"As the global population ages, the instances of medical complications will increase, and many consumers will prefer to manage their ailments with food"

11 million

preventable deaths globally per year, due to unhealthy diets [8]

[8] *Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems (January 2019)*

[9] *Global Burden of Disease study by the Institute of Health Metrics and Evaluation (IHME) in Seattle, published in the Lancet medical journal. 2019*

ingredients in ready meals, making it even easier for customers to get extra nutrients into their diets.

Faced with an epidemic of Type 2 Diabetes, medical institutions across California have introduced 'shop with your doc' [10] food programmes, where healthcare providers offer in-situ nutritional advice from a professional healthcare practitioner. Another pilot, Geisinger Health Systems' 'Fresh Food Farmacy' [11], targeted illness stemming from food insecurity by providing fresh produce and educating patients on lifestyle approaches to better manage their disease.

Inspired by the successes in the US, British general practitioner Dr Rupy Aujla has been developing a medical education programme and public awareness campaign to kickstart his vision for mainstreaming 'food in medicine' practice in the UK. In a similar vein, Lambeth GP Food Co-op has been setting up community gardens at its GP practices across the London borough to provide a space for people to socialise, learn and grow food together.

While the awareness of the role of a nutritionally balanced and diverse diet in maintaining health is growing, by 2025 nutrition is likely to incorporate more into how customers manage their health. As the global population ages over the coming years, instances of medical complications are set to increase. Coupled with the prevalence of wearable healthcare technology, healthy diets are expected to be tailored to individual needs, empowering people with personal control over their health.

[10] Websites: https://www.thequeen.org/shop-with-your-doc/ and https://www.hoag.org/news/shop-with-your-doc/

[11] www.geisinger.org/freshfoodfarmacy

By 2025 we will be eating our way to a healthy planet and population, stemming from the unstoppable rise of public awareness of how our food impacts not only our individual health but the health of the environment. Our palates, hungry for 'ecological public health'[12], will become more and more adventurous in using food as a tool for environmental action.

[12] *Ecological public health: the 21st century's big idea? An essay by Tim Lang and Geof Rayner (BMJ, 2012)*

Scenario 2050

It's Tuesday, 12 July 2050.

Julia, who now lives in Cornwall, greets a regular customer. It's Mr Walker. The local councillor comes to the facility every week to select cuts for his family dinner and watch the meat being printed out.

Her business, which offers a range of environmentally friendly proteins, really took off after the decline of abattoirs in the UK in the 2040s. Alongside cultured meat, she offers jellyfish, seaweed and algae, sometimes fresh, but mostly dried and prepared on site and sold as pastas, flakes and powders.

At one end of the property is a farm, cultivating plants that will provide the growth serum in which cells are developed. At the other, giant meat-growing vats lead to a small conveyor belt where the meat is "assembled" with 3D printing technology. The artisan factory has a number of its own robots and the only humans involved in the process walk between the belts performing quality control. Her customers really value the complete transparency of the whole process. The whole process is visible to them, both digitally and physically - even the walls are made from a durable, flexible glass!

After saying goodbye to Mr Walker, Julia receives an alert on her personal robot assistant that links her to real-time data about some marine stocks that are due to come in later that week. She will be able to prepare some customer offers, promoting the ocean area the stock comes from and the fishermen who harvested it.

Cultured meat

Claire Hughes,
Head of Quality and Innovation, Sainsbury's:

"In the past technology has led to great shifts in our diet. A great example is the rise in popularity of chicken. In 1948 just two per cent of households in Britain owned a fridge, making it impossible to safely store perishable food such as vegetables, dairy and chicken. But even in 1959, only 13 percent of homes had a refrigerator. While the adoption of refrigerator technology in the home was taking place, chicken was seen as an elite food and was expensive. Then, the cold chain revolution happened. By 1965, retailers such as Sainsbury's dropped the price of poultry by nearly a third, recognising it was a good alternative to red meat and could be produced to feed a growing nation. This caused demand to soar and 25 years later almost a quarter of the meat eaten in Britain was chicken or turkey."

With the world's population expected to reach nine billion people by 2050, it will not be sustainable to produce and consume the same quantities of meat that we currently eat in 2019. The average European eats 80kg of meat per year, while North Americans and Australians eat over 110kg per year [13]. If populations who have historically eaten less meat follow our eating habits, we won't have the natural resources or environmental stability to produce for global demand.

As our understanding of the impact of meat on the environment grows, governments around the world are taking steps to persuade citizens to change their eating habits. In 2018 the UK introduced a levy on sugary drinks in an attempt to improve public health by encouraging the public to consume less sugar. A recent report by FAIRR suggests a similar kind of 'Sin Tax' on meat may be on the cards in the near future [14]. Meat taxes have already been discussed in parliaments in Germany, Denmark and Sweden and China's government cut its recommended maximum meat consumption by 45% in 2016.

Cellular proteins, 'meaty tissue' cultivated independently from animals using stem cells, is drawing much attention for its promise of reducing the need for farmed animals. While beef and fish are currently major areas of development, other applications expected in 2050 include eggs, milk and gelatine. Although environmental claims are in their early stages, cellular proteins aim to produce radically less greenhouse gases and require fewer resources such as water and land when compared with today's methods.

But while 'cultured meat' has captured the imagination of some of the world's food technology investors, in the eyes of the consumer, there are unanswered questions. How will plant-based 'growth serum' be free from allergens, and how might this be labelled? What will the calories and nutritional qualities be of such 'created' meat? Will the production process really prove to be as climate-friendly as companies claim?

The big shift in 2050 is predicted to come through a concerted effort to change social norms and make such products appeal to consumers. This will possibly involve a radical shift from perceiving meat as innate to animals to perceiving cultured meat as a healthy and efficient protein tissue that is lab-grown, much in the same way we would brew beer.

Paul Shapiro,
author of Clean Meat, How Growing Meat Without Animals Will Revolutionize Dinner and the World :

"It's tough to predict 30 years into the future, but we do know this: we're going to have to produce a lot more food with fewer resources in 2050 than we do today. The thought that we'll produce meat (which is very resource-intensive) the way we do today is unrealistic. Far more likely is that we'll be making meat from plants, as well as culturing it from animal cells. That's not to say we won't have any meat from slaughtered animals, but it will no longer be the dominant form of meat."

[13] *UN Food and Agriculture Organisation / OurWorldinData (a joint project between Oxford Martin and Global Change Data Lab*

[14] *www.fairr.org/resource/livestock-levy-regulators-considering-meat-taxes/*

Ideas of how this might happen are already emerging. The fictitious Dutch restaurant, Bistro-In-Vitro, hit the headlines in Europe in 2015 for its provocative chic virtual restaurant and menu depicting in-vitro creations including in-vitro 'fish', fresh from a tank of growth serum.

Hosting beautiful photography and graphic videos, interviews with visionary scientists, experts, renowned chefs and critics, the design fiction platform aims to provoke discussion on the ethics, aesthetics and prospects of lab-grown meat, with a view to making a new food culture possible. It illustrates how by 2050, restaurants and retailers will have perfected their in-vitro offerings with a playful creativity that tests the boundaries of our current ethics around meat.

Because cellular proteins rely on synthetic biology, that is, biological material that is 'redesigned' at the cellular level, it is presently technology-heavy and - alongside those questions raised above - currently only accessible to those companies with the resources to invest in it. Due to the enormous research costs of developing cellular meat, Dr. Mark Post's first lab-grown burger at Maastricht University in 2013 had an estimated cost of £215,000, but this is due to fall. Today, start-ups such as The Future Meat company in Israel claim they will be able to put the same burger on the table for under £5. By 2050, there is no doubt that this will be a genuine market competitor to farmed meat.

But some groups, like the Shojin DIY Meat Community, are looking to democratise the technology and make it more accessible, so that everyone has the possibility to grow their own by 2050. Based out of Tokyo, the community aims to bring the science of cultured meat to the masses. From its humble beginnings with one man, a home petri-dish and a fertilised chicken egg, it has now grown to be an active online community connecting roughly 30 synthetic biology enthusiasts discussing their homegrown meat experiments and related topics. It is now working to overcome the cost and technology hurdles, such as the serum in which the meat tissue grows.

Fast-forward to 2050 and open-source technology, accessible and public cellular agriculture research might just be the foundation for a post-industrial bio-economy. Rather than getting a cut of meat at the supermarket, consumers may well be able to get their own grow it yourself ingredients for home-cultured meat, fish, eggs, milk or gelatine, at a fraction of the cost that exists today.

Cellular protein could be a tool to help us meet the protein needs of a growing global population of the future. However, its research is still in its early days, with a lot of questions regarding the economic viability and consumer acceptance currently unanswered.

The average European eats

80 kg

of meat per year, while North Americans and Australians eat over

110 kg

£215 000

Was the cost of the world-first lab-grown burger in 2013. Today the same burger can be made for under £5

Expanded oceanic diet

Paul Greenberg, *Author, Four Fish:*

"We can't overfish or over-farm the oceans if we want to ensure enough fish to feed the world's growing population into the future."

9 billion

world population by 2050

Several avenues are being explored to relieve the future pressures of a fast-growing population on habitats, land and soil. Protecting marine ecosystems is a major global challenge - one solution may lie in the world's oceans, where many new sources of food have yet to be discovered.

With fish a primary source of animal protein for at least one billion people in the world [15], the stakes are high when we consider how intrinsically linked the health of our oceans is to our environmental, social and economic wellbeing.

The threat of sustainability to our oceans will be a major consideration by 2050 - as such, Sainsbury's is proud to have been recognised in 2017 by the Marine Stewardship Council (MSC) as the best sustainable seafood supermarket in the world. This is based on the sheer volume of MSC certified products available on-shelf and its pledge that all wild-caught or farmed fish to be independently certified as sustainable by 2020.

Similar to our reliance on a small number of profitable, yet concentrated crops, the British seafood diet currently relies on staples of cod, haddock, salmon, tuna and prawns. However, with a global population of 9 billion by 2050 turning to the ocean for more authentic protein (compared to 'cultured meat'), diversity will be key to maintaining the health and vitality of marine environments.

Sainsbury's is also leading the way with this much needed recognition of lesser-known species through its Fishmonger's Choice range. Caught off the South West coast of the UK, the range includes the likes of freshly caught ling, whiting and monkfish, depending on the season. Looking to 2050, this may well expand to lesser-eaten species such as porgy/bream, dogfish, lionfish and barramundi, valuing **previously overlooked nutrient sources** and **exploiting the abundance of invasive species.**

Between the current growing awareness of food waste and adventurous appetites of the consumer lies an ocean of opportunity for food businesses by 2050.

In New England, US, chefs have responded to the invasive green crab, which has wreaked havoc on the local ecosystem, turning it into a tempura-style menu item. Taking things further,

MICRO TREND

We know less about our oceans than we do about the surface of Mars, which is ironic. This causes a problem in terms of exploiting the ***oceans as a resource****, not understanding the damage we're causing. But this is also an opportunity to explore more in order to balance our relationship with the oceans and what we use from them.*

MICRO TREND

Due to various factors such as sea temperature rise, change of ocean streams and many other natural changes, we are seeing a big rise in many ***invasive species****, which are causing a disruption and risk to the ecosystem. Many of these can become a great source of food for humans.*

[15] *FAO (2000) The State of World Fisheries and Aquaculture 2000. FAO, Rome, Italy.*

local healthy ocean advocate and chef Bun Lai's restaurant, Sushi Miya, is based on a 42-page manifesto-style menu, setting out just how future food demand can be channelled into a force to support environmental balance.

Similarly, near London, Crayfish Bob is an enterprise creating new outlets, dining events and retail products using the non-native crayfish that has invaded the Thames.

MICRO TREND

*Explosive growth of **jellyfish** populations due to climate change, overfishing, nutrient runoff, and habitat modification.*

In recent years, **jellyfish blooms**, caused by warmer, more acidic oceans with reduced numbers of predators, have become a source of concern for communities and industries near the coast. Jellyfish are typically regarded as a last resort food source, but the growing interest of researchers and seafood chefs is triggering a re-think.

A team of Danish researchers, for example, has devised a method to turn jellyfish, which are rich in nutrients, including vitamin B12, magnesium, and iron, and low in calories, into crunchy chips in just a few days. Fast-forward to 2050 and jellyfish could provide a regular nutrient-rich addition to our supper tables and the basis for many dried ingredients and sauce mixes found on the supermarket shelves.

MICRO TREND

***Seaweeds** are used extensively as food in coastal cuisines around the world, even since pre-historic times, due to their nutritional value as a source of fibre, vitamins, calcium, magnesium and iodine.*

Seaweed is vastly abundant and has the potential to alleviate environmental pressures, absorbing massive quantities of carbon and providing habitats for water-filtering species. As it is also highly nutritious, it is fast gaining attention as an item for the diverse seafood menu. Currently, vegan seafood products are capitalising on the versatility of kelp and seaweed to form new tastes. French food business GlobExplore offers a fresh and salted seaweed; Chilean company Quelp has developed a kelp-based burger; and Sainsbury's is about to launch a seaweed range called Weed and Wonderful.

But it is perhaps the story of US-based fisherman and entrepreneur Bren Smith that shows the most promise for our diverse 2050 seafood diet. His company, Thimble Island Oyster Co, provides open-source blueprints for a 40-acre farm that uses the entire water column to grow everything from sugar kelp and oysters to mussels and scallops. It regards itself as a 'sustainable 3D ocean farm' with tiny footprints and massive outputs. With potential for conserving ocean ecosystem diversity and for supporting coasts against storm surges, this hyperlocal, 'polyculture' model has emerged as an example for achieving long-term ocean restoration and economic development.

The potential for a diverse seafood diet of 2050, comprising a range of marine plants and organisms as well as their applications, will look to respond to the needs of local ecosystems, helping maintain the marine balance and regenerating coastal towns.

Dr Polly Russell,
Food Historian:

"In the decades which preceded the foundation of Sainsbury's, low trust in food producers and food retailers was commonplace. At a time when refrigeration was yet to be invented and expanding city populations were reliant on complicated networks of distribution, food was often poor quality, rancid or decaying by the time it reached the consumer. Furthermore, working, urban populations were vulnerable to unscrupulous food providers who sought to increase profits by adulterating foods.

Throughout the nineteenth century a series of public health scares and investigations into food quality revealed a shocking levels of adulteration including in essentials like flour, milk, bread, jam, beer, coffee and tea. Adulteration was not only deceptive, it could be dangerous - common adulterants such as lead and chalk were potentially toxic. The first Food and Drugs Act was passed in 1860 and by the 1870s improvements in the act established important principles and became the foundation of modern food law.

In this context, while Sainsbury's slogan "Live Well For Less" feels like it addresses contemporary concerns, the supermarket brand, established in 1869, was built on providing quality, trusted food at affordable prices in a food landscape where these attributes could not be assumed.

The need to build trust in food at the end of the nineteenth century and start of the twentieth century went hand in hand with the emergence of food brands. Sainsbury's own-label tea, for example, which launched 1903, enlisted the expertise of a specialist tea merchant, George Payne to develop a series of own-label teas. Each blend was named after the colour of the seal on the packet. Deploying what were relatively new marketing techniques in packaging design and named brand identity, Sainsbury's, highlighted the importance of consumer trust and food quality from its earliest days of business."

Exploring food roots

As public interest in food grows, so does our appetite for knowing more about where it comes from, how it has been grown or produced, and its environmental impacts. This surge in curiosity is fuelled by a parallel expansion of our technological capability for obtaining the information we seek. This trend will continue to grow and evolve in the next 30 years.

Already the Z Generation, who have never known not having a device in their hands, has a different relationship to technology than those before them. This will be even more true of the next Generation, Gen Alpha, who will emerge into a crowded, clever and connected world of super fast digital communication, be better equipped than any other generation to tackle the problems we cannot solve today, with instant access to any information from anywhere across the globe. "Brands will need to respect the environment that these people inherit, and do so convincingly: social media and other digital networks will leave nowhere to hide [16].

Gen Alpha will be less concerned with 'more' and instead use their spending power to attain lifestyles with more positive social and environmental benefits. Around the world, we already see people beginning to question the costs of their purchasing choices – wanting to know more about where their food comes from and questioning the health implications of their diet. Current aspirations of bigger, faster, more, will shift towards a new type of smarter, cleaner and healthier lifestyle. This search for better more sustainable lifestyles offers a unique opportunity to supermarkets to do things differently.

Already today we are seeing an enormous increase in the organics market, testament to the consumers' interest in the quality of the food they are buying. 2018 saw a 5.3% increase in total market growth of organic food, with organic sales topping £3.22bn in the UK [17] and Sainsbury's led the way as the first UK retailer to launch its own organic range in 1986, with over 250 SO Organic products available on its shelves today.

Highly aware and technically literate consumers are already using technology to improve standards, traceability and transparency. The rise of **social media** allows consumers to share and inform one another, in turn this will influence business directions and decisions.

MICRO TREND

Social Media *is becoming an increasingly important source of trust and verification of products and services, especially in sectors like food, where often the reviews of peers are more trusted than those of experts.*

[16] *www.grantthornton.co.uk/insights/what-does-the-future-hold-for-generation-alpha/*

[17] *www.soilassociation.org/certification/market-research-and-data/download-the-organic-market-report/*

MICRO TREND

Blockchain *is essentially a digital tracking system which records all transactions, where information is held in an encrypted, distributed computer network, rather than by a central authority.*

Retailers already have sophisticated insights into the complexity of their supply chains, but customers generally rely on certifications, eco-labels and brand promises to find out what they want to know about their food. However, a growing number of new technological systems, and a need for more personalised and extensive types of information is driving a fresh approach to giving customers much more control over how they choose, buy, prepare and eat foods rather than simply providing factual information.

Using the latest mobile technology, consumers can already scan products on the shop floor to bring up information about the origin and journey of food and other products they are interested in purchasing. This additional layer of intelligence is likely to become increasingly common in 30 year's time.

Many food companies that are exploring the use of **blockchain technology** to allow a complete tracking and tracing capacity in the food supply chain. Blockchain can enable open-source transparency technology that allows all information about any given product - such as farm origination details, batch numbers, factory and processing data, expiration dates, storage temperatures and shipping details - to be made available.

In 2016, MIT developed concepts for the "Supermarket of the Future". According to Carlo Ratti, founder of MIT's Senseable City Laboratory, customers of the future will be fully informed about their food choices: "We will be able to discover everything there is to know about the apple we are looking at: the tree it grew on, the CO2 it produced, the chemical treatments it received, and its journey to the supermarket shelf." In this future vision, sensors will allow customers to find out more about any item on the shelf by simply lifting it up towards overhead digital displays. Sensors built into the mirrored display will identify the item and present detailed information on price, nutritional value, presence of allergens, pesticides or fertilisers used in production, journey to the supermarket and waste disposal instructions. Additional monitors display information aiming to promote more conscious and sustainable consumption [18].

This new technology-driven food future will begin to change the shape of what we are eating. Mike Lee developed a futurist food project to explore how we will produce and shop for food over the next 25 years, to help food companies innovate more ambitiously today. The Future Market, a pop-up concept grocery store, demonstrates how the mainstreaming of today's cutting-edge trends, behaviours and technologies will become mainstream products and services towards 2050. Lee predicts that uniform, mass production and marketing will have fallen out of favour and food will be highly tailored to each individual customer. With every customer having their own Food ID, diets could be extremely customised, with fruit such as mangoes offered to us at our preferred stage of ripeness, and 3D printed savoury snacks on demand according to our exact spice tolerance. Systems will record and analyse food preferences with user inputs and real-time biometrics.

[18] *https://docs.wbcsd.org/2018/06/WBCSD_Future_of_Food.pdf*

The convergence of new technological developments will see the rise of trends of Cultured Meat, Exploring Food Roots and an Expanded Oceanic Diet. This new technology will lead to a significant expansion of food groups which will allow us to use our planet's resources more sustainably whilst exploring new and adventurous produce.

Scenario 2169

It's 10.00am, Monday 3 April 2169, 150 years from now.

Jill (Julia's granddaughter) feels a vibration in her wrist. She taps her skin twice to switch off the alarm, which notifies her nutrition drip to prepare her breakfast shot, which was dispatched last night from Sainsbury's in preparation. Today is the 50-year anniversary of Drawdown, the first mission of robotic farmers to resuscitate the desert, triggering a chain of global rebalancing that reversed climate change.

Jill blinks right to the latest news and closes her eyes to watch the report. The famous scene with the autonomous arm laying the first layer of soil on baking sand, the temperature of the air too hot for humans, fill her with wonder at one of the major feats of humankind.

In the last 50 years, communities around the world have worked tirelessly to re-introduce the plants and vegetables that were once indigenous to their regions. These 'stewards of the land' have done much to understand the language of nature so as to develop a circular life within planetary boundaries. Waste wasn't just eliminated, it is a word no longer in use. Jill is interrupted by Hal-Lo, who administers her intravenous breakfast, before she gets ready for her day.

The local community outside of Leeds, where Jill's ancestors lived as far back as 2019, are planning a social eating experience to celebrate. The committee has been planning the major and micro tastes and textures for some weeks, sourcing the ingredients from both its own supply of vegetables and grains as well as local bio-reactors and culture farms. Despite this technological shifts, the celebration of food continues to be a celebration of life.

Farming impossible environments

DEFINITION

A circular economy *is an economic system aimed at minimising waste and making the most of resources. This regenerative approach is in contrast to the traditional linear economy, which has a 'take, make, dispose' model of production.*

DEFINITION

Half-earth *is a principle advocated by biologist E.O. Wilson, where half of the earth's land and surface is designated as a human and development-free reserve to halt habitat loss and preserve biodiversity and the law of ecocide -- making the extensive damage to, destruction of or loss of ecosystems a criminal and prosecutable act.*

2169, 150 years from now, may seem a long way off, but the seeds of the future are already taking root. Instead of a future predicted by many, where humanity, driven by the state of the Earth in the latter half of the 21st century, is dependent on far-away colonies on the moon and Mars, a combination of technological research, human intelligence and coordinated global action could likely lead to a very different outcome: the renaissance of a lush, biodiverse Planet Earth.

As the reality of climate change sets in, society may be compelled to implement previously unthinkable measures such as a fully **circular economy**, a **'half-earth' rule** and the introduction of new legal measures that prohibit environmental damage. These would restrict waste and the destruction of ecosystems, while ensuring human development takes up no more than half the earth's surface. Enabled by technology, these measures are thought to have a profound impact in regenerating and restoring the balance of life on Earth. The systems developed for remote farming in extra-terrestrial regions could even drive the application of extreme farming here on Earth. Large-scale projects to support reversing desertification and **sustainable saltwater farming methods** will be implemented to help tackle global challenges such as availability of water, energy and food, while restoring roughly 32 million square kilometres of land.

Initiatives such as Afforest4Future and the Great Green Wall project, combining the planting of indigenous species and regenerative agriculture techniques, are already taking place in 2019 - Sainsbury's has planted over three million trees since it launched its partnership with the Woodland Trust in 2004. These and the numerous and successful examples of Saltwater farming: from Charlie Paton's 'Sundrop Farms', tomato-producing greenhouses in the Australian bush, to Michael Pawlyn's Sahara Forest project and Allan Savory's Holistic Management process for grassland grazing [19] have already demonstrated the possibilities for reversing desertification.

Sainsbury's has also been working with Kew Royal Botanic Gardens to help re-establish native species in the desert farmland of Peru - where their suppliers now grow crops such as grapes and asparagus. The idea is to introduce native species – such as deep-rooted huarango trees,

DEFINITION

Crop tolerance to seawater *is the ability of an agricultural crop to withstand the high salinity induced by irrigation with seawater, or a mixture of fresh water and seawater. There are crops that can grow on seawater and demonstration farms have shown the feasibility.*

[19] *www.savory.global/holistic-management/*

MICRO TREND

A visit to Mars *is almost guaranteed within the next decade or so, with everyone from NASA to tech billionaires setting their sights on the Red Planet. One of the main challenges with this adventure is growing edible plants on Mars, due to soil conditions that hold no nutrients, a lack of gravity that helps plants orientate themselves, and the presence of nasty chemicals called perchlorates. Researchers at the University of Guelph in Canada are growing plants in low-pressure, or hypobaric chambers to mimic the thin atmosphere of Mars. The team exposes plants to a host of rough conditions — including varying levels of carbon dioxide, pressure, heat, light, nutrition and humidity — to see which plants are hardy enough to survive Martian conditions outside a self-contained, air-controlled greenhouse.*

While we might never end up living on Mars, the learnings from these projects may help us 'repair' our own planet Earth that we have been damaging so much since the industrial revolution.

which help soil stay fertile – for the benefit of Peruvian agriculture and to create 'corridors' of biodiversity, which attract native species such as guinea pigs, lizards and foxes.

By 2169, the revival of deserts, coupled with carbon-neutral logistics, means that we may well be eating vegetables and produce from areas that were once unthinkable as agricultural or arable land.

But it is perhaps these sustainable desert greening methods, together with the emergence of autonomous farming that will open up the possibilities to transform impossible environments here on Earth, rather than on **Mars or the moon**. The evolution of technology and advancement in smart AI mean these transformations could well be managed by robots rather than people.

Currently, we're already seeing AgBots, agricultural robots, performing tasks ranging from planting and watering, to harvesting and sorting. AgBots, together with unprecedented data streams, have the potential to help us know exactly how to make soil fertile without using harmful chemicals.

By 2169, the technologies of seawater and desalination, vertical farming, big data, climatology and agronomy may give us the tools to start to restore the earth, through regenerative farming and scaling up greening efforts globally. Together, the autonomous farm manager and regenerative communities will be the stewards of this revived, agricultural, balanced land - sending constant status updates back to retailers, to ensure that shelves and homes are stocked to the optimum level and food waste becomes a thing of the past.

James Wong, *Plant Scientist:*

"The concept of vertical farming is the brainchild of Columbia University Professor Dickson Despommier, who developed it in discussion with students he was teaching within his Medical Ecology course. The idea behind it was to grow food 'vertically' in disused urban spaces, using a hydroponic or aeroponic (where plant roots are misted rather than submerged) system. Hydroponic growing has been in commercial use for a while. Plants are grown in water or in an inorganic fabricated substrate, in buildings that may or may not have windows - if not LED lighting is used. These laboratory conditions are completely controlled to create sterile environments in which the plants are grown. They today go against the human vision of how plants for food are produced, however this new technology could pave the way for farming in the future."

Dr Polly Russell,
Food Historian:

“It might seem strange now, but when self-service first appeared in Sainsbury’s stores in the 1960s it was regarded as a radical, new way of shopping. Photographs from the time of the first conveyor belt in a store show housewives peering through the window to peek a glance at the modern, new system. Self-service started in America in the 1920s but the first, small self service shops did not appear in the UK until the early 50s. The relatively rapid adoption of self-service throughout the 60s reflected the changing social and economic landscape of post-war Britain – car ownership was on the rise allowing for bigger shopping loads, increasing numbers of women were working and had less time to shop, and developments in production, packaging, transport and refrigeration transformed the variety of foods available.

Self service reflected a new way of shopping in post-war Britain but well into the 1950s much food was still delivered direct to consumers by delivery boys on bikes or delivery vans. So while online delivery today seems like an innovative way of shopping, delivery has long been a feature of the food retail system. Sainsbury’s was the first UK retailer to bring in-app mobile payments to customers in a grocery store through its SmartShop technology and is also experimenting by testing the app in the first UK’s first till-free grocery store.

In the future the delivery lorry which distributes online shopping might well be replaced by drones, driverless cars, or even by robot home assistants but direct delivery is still likely to be with us.”

Personalised optimisation

MICRO TREND

A microchip *implant is essentially a highly sophisticated personal fitness, nutrition and health monitor connected to the internet, that can also be used as a form of data and ID carrier.*

MICRO TREND

A neural lace *is an ultra-thin mesh that can be implanted in the skull, forming a collection of electrodes capable of monitoring brain function. It creates an interface between the brain and the machine.*

Personalised Optimisation is a trend that could see people chipped and connected like never before. A significant step on from wearable tech used today, the advent of **personal microchips** and **neural laces** has the potential to see all of our genetic, health and situational data recorded, stored and analysed by algorithms which could work out exactly what we need to support us at a particular time in our life. Retailers, such as Sainsbury's could play a critical role to support this, arranging delivery of the needed food within thirty minutes - perhaps by drone.

In Sweden, we're already seeing this emerge, with around 4,000 people already using implanted chips to access buildings, make payments and use public transport. By 2169, we may well see people scanning their weekly statistics via the embedded chip in their skin, which will in turn send an automatic status read to Sainsbury's. The supermarket would then instantaneously dispatch the correct food and drink order for them based on their individual nutrition needs, behaviours and activities for the coming days.

Technological advancements mean that in 2169 personalised nutrition could also be delivered to us via implants or on-skin patches, providing us with exact daily needs of micro-nutrients. Such methods are already being tested today by start-ups such as Get A Drip and even the US military is developing a Transdermal Nutrient Delivery System (TDNDS) nutrition patch that will transmit vitamins and other micronutrients, enhancing physical and mental performance.

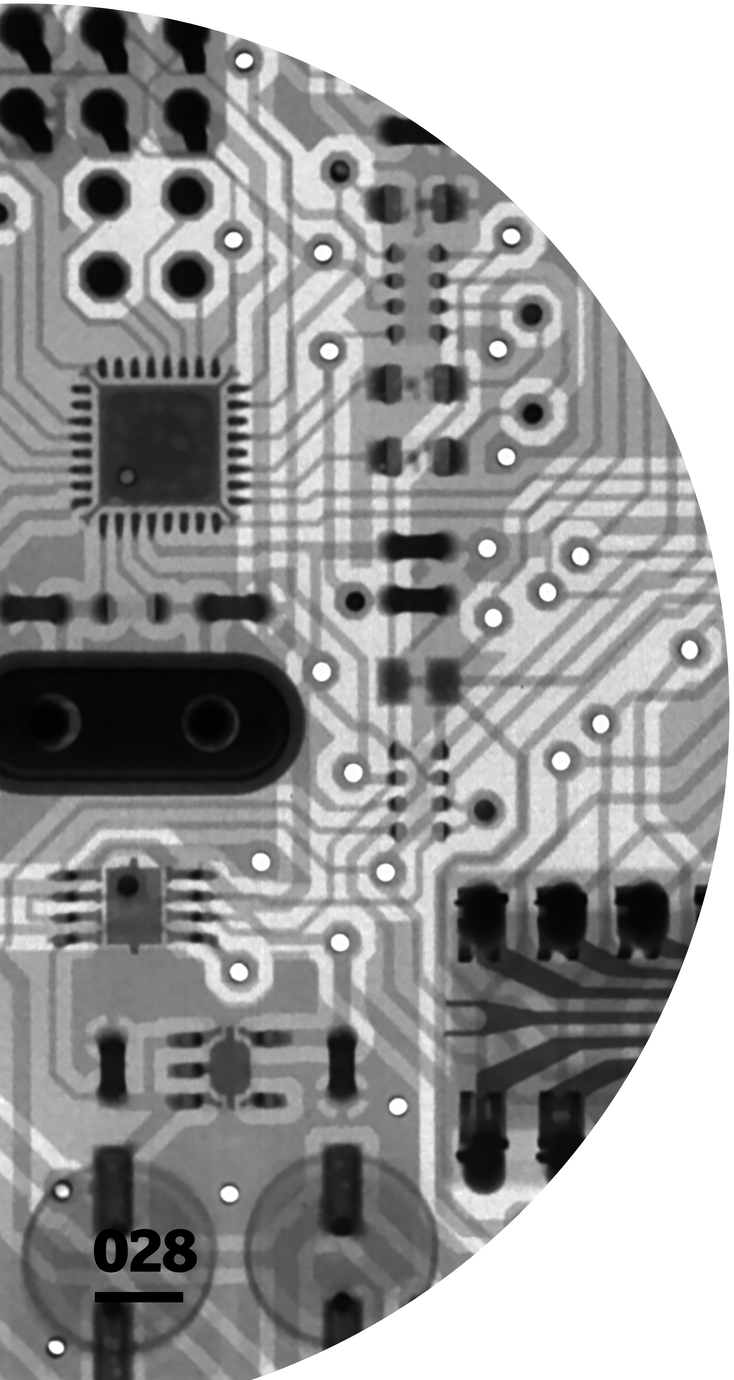
Today's algorithms and Artificial Intelligence (AI) capabilities tend to be smart calorie counters and nutritional advisors for people wanting to achieve a certain weight or fitness goal, but the connected world of 2169 could see our AI personal nutrition advisors shop, prepare and tailor meals to optimise our health, ensuring that we only use exactly what we need, with food waste a thing of the past. Food production and consumption - conscious and mindful of personal and ecological public health [20] - will be taken to a whole new level driven by real-time information about anything, anywhere, anytime.

This in turn may have an impact on the role that 'real' food could play in society. Freed up from the chains of full-time work, which could now be performed by AI, society is likely to have more

Tim Spector, *Professor of Genetics and Author:*

"I don't think there's going to be a universal diet that's going to suit everybody because we all respond differently to food. Studies have shown that even identical twins respond differently to the same food. So we will experiment more, and personalised nutrition will take off."

[20] *Ecological public health: the 21st century's big idea? An essay by Tim Lang and Geof Rayner (BMJ, 2012)*



time on its hands - time that could be dedicated both to understanding our reintroduced ecology, exploring the art of cooking and how that brings families and friends together.

As an antidote to the scenario of purely functional administering of nutrition for necessity, food in its fullest sense - taste, sensation and culture - may well become a practice for preserving a sense of human identity in an increasingly digitised world.

In 2169, in a society where food sways between being a nutrition and health function and a shared sensory experience that celebrates life, food etiquette is set to incorporate new eating habits and rituals. While nutrition patches and implants may replace our day-to-day meals, traditional social moments - such as birthdays or weddings - could be bigger and better than ever before, with the pleasures of food strengthening the bonds of community.

The Slow Food Movement of today - which promotes a better way to eat, celebrates rich food traditions and supports biodiversity - suggests how this might unfold, 150 years' into the future. From organising large-scale people-led feasts - where the food on offer reflects the undeniable connection between plate to planet - to connecting virtual communities around the world, Slow Food, coupled with an unprecedented availability of real-time data about anything, could celebrate preserved ecosystems and encourage the further cultivation of native flora and fauna.

4000

people in Sweden already using implanted chips to access buildings, make payments and use public transport.

Contrary to the dystopian future drained of humanity that is imagined by many, the combined force of Personalised Optimisation and Farming Impossible Environments carve a path for how we can cut food waste, bring deserts back to life and celebrate our humanity through the act of eating. This will bring about a renaissance of planet Earth by reconnecting to our environment, and to each other.

Conclusion

Claire Hughes,
Head of Quality and Innovation, Sainsbury's

As we have shown in this report, the world and the way we eat will change significantly over the next 5, 30 and 150 years.

As a retailer which has been constantly evolving and innovating in food, it's incredibly exciting to look back at where we came from in our first Drury Lane store in 1869, serving the best butter at affordable prices, to predicting where we could be in another 150 years.

We know from our Living Well Index that eating together plays a significant part in our happiness, so whilst we predict the act of eating to be different to how it is it today, its central role in connecting communities will remain.

While it's difficult to know exactly which of today's trends will translate into our everyday lives in the future, we do know that Sainsbury's will continue to be there for our customers - playing a huge role in feeding the nation in the years to come.

About this report

The Sainsbury's Future Trends Report has been published by Sainsbury's to mark its 150th birthday. Sainsbury's worked with innovation agency Department 22 to identify, distil and develop trends for the years 2025, 2050 and 2169.

About J Sainsbury plc

Sainsbury's commitment to helping customers live well for less has been at the heart of what we do since 1869. Today that means making our customers' lives better and easier every day by offering great quality and service at fair prices – across food, clothing, general merchandise and financial services – whenever and wherever they want to shop. Our vision is to be the most trusted retailer where people love to work and shop. Our colleagues, strong culture and values are integral to achieving this vision and driving our success – now and in the future.

About Department 22

Department 22 is an innovation consultancy, specialising in design, technology, sustainability and food, transforming global challenges into exciting new business opportunities through design-thinking.

Contributors

Claire Hughes, *Head of Quality and Innovation, Sainsbury's*
Alexa Masterson-Jones, *Trends and Innovation Manager, Sainsbury's*
Dejan Mitrovic, *Director, Department 22*
Clare Brass, *Director, Department 22*
Thomas Leech, *Director, Department 22*
Gina Lovett, *Consultant, Department 22*
Dr Polly Russell, *Food Historian and Curator*
James Wong, *Plant Scientist, Author and Broadcaster*

Biographies

Claire Hughes

Claire Hughes joined Sainsbury's in 2018 as its Head of Quality and Innovation. She has 16 years of experience in retail and is a nutritionist by background. Throughout her career, Claire has led pivotal programmes such as salt reduction, innovation in labelling and developing and launching products to meet the evolving health needs for customers. At Sainsbury's, she oversees all customer facing elements of the Sainsbury's Brand grocery and fresh produce lines. This includes launching new products based on insights and trends, alongside packaging design and branding, whilst ensuring all products meet the highest standards. Not only does she look at current trends to inform new products, she also looks forward to ensure Sainsbury's has a constant pipeline of innovation to bring to the market.

Alexa Masterson-Jones

Alexa Masterson-Jones is the Trends & Innovation Manager for Sainsbury's Brand, responsible for researching emerging food trends to identify innovation opportunities. Following a degree in Geography where she developed an interest in Human and Economic Development, particularly in food systems, Alexa joined Sainsbury's Graduate Scheme in 2012. Her previous roles at Sainsbury's included Product Development across a number of food and non-food categories, notably responsible for rebranding and developing new products for our Deliciously FreeFrom Brand.

Dejan Mitrovic

Dejan Mitrovic is co-director of Department 22. He has 15+ years experience in the fields of design, technology and education and brings a creative approach to challanges in the food sector through user-centered design. His core expertise is in sustainability, product development and creative direction. Dejan lectures about design, entrepreneurship and systems thinking at various universities, including Royal College of Art, Imperial College Business School and Cass Business School, and has setup several successful start-up businesses.

Clare Brass

Clare Brass is co-director of Department 22. She is an expert in circular economy and sustainability, helping businesses and creative talent transform environmental issues into entrepreneurial solutions. She was head of sustainability at the Design Council before setting up SEED Foundation, working on user-centred environmental challenges such as food, water and waste. She set up and ran SustainRCA at the Royal College of Art, using design thinking skills to address sustainability and circular economy challenges. She was a mentor for the Ellen MacArthur Foundation, and teaches at Imperial College Business School.

James Wong

James's new book, 10-a-day the Easy Way includes fuss free recipes and talks simple science to help transform your health by increasing the amount of fruit and vegetables you eat each day. James presents the BBC daytime coverage of the RHS Chelsea Flower Show and has been involved in a number of other productions including, Grow Your Own Drugs, Countryfile, Gardeners World, Gardeners Question Time, Great British Garden Revival, Our Food and Fossil Detectives all for the BBC and Expensive Eats for Channel News Asia, a global odyssey to introduce viewers to some of the most expensive and sought after delicacies from around the world including yubari melons, saffron and black ivory coffee. Previous books include two Grow Your Own Drugs TV tie ins, Homegrown Revolution, Grow for Flavour and How to Eat Better. In conjunction with Sutton Seeds James has a complimentary seed and plant range for the latter two. James also writes a weekly column for the Observer Magazine and is the in house Ethnobotanist for Liz Earle. Determined to bring new life to an old genre, his raw passion and untameable sense of adventure are infectious. James is a unique blend of explorer, anthropologist, gardener, and always, ethnobotanical adventurer.

Dr Polly Russell

Dr Polly Russell works as a Lead Curator of Contemporary Politics and Public Life at the British Library and as a freelance food consultant and writer. Polly is co-presenter on the BBC2's popular living history series, 'Back in Time for Dinner' made by Wall to Wall TV and its follow up series 'Back in Time for the Weekend', two Christmas specials, 'Further Back in Time', 'Back in Time for Tea' and most recent series "Back in Time for School" which transmitted in early 2019. She is also a regular presenter on the BBC1 daytime series 'Royal Recipes' and was the Food Historian on the BBC2's Best of British Takeaways and regularly appears on BBC 2 series 'Inside The Factory'. At the British Library, Polly is responsible for developing collections and services in the fields of Politics and Public Life, Food Studies and Women's History.

Polly's research interests include the history of British food and the ways that food is connected to social, cultural and political aspects of everyday life. This direction has been informed by years of active interest in both cooking and eating, and of keeping a watchful eye on trends in food production and cookery both in the UK and abroad – before securing her first academic post, Polly spent time researching food in Louisiana, worked at Moro and the Carved Angel, and was a food-product developer for Marks & Spencer. Outside of her curatorial role, Polly now divides her time between consultancy, writing and broadcast. She works with Heston Blumenthal as his historical researcher, has a regular column in the FT Weekend magazine, ('The History Cook') and has written for the Guardian, the Times and Waitrose Magazine.

150 Sainsbury's
Est. 1869

Sainsbury's

Graphic design by: **Polina Chemeris**