Food future 2035

The critical decade

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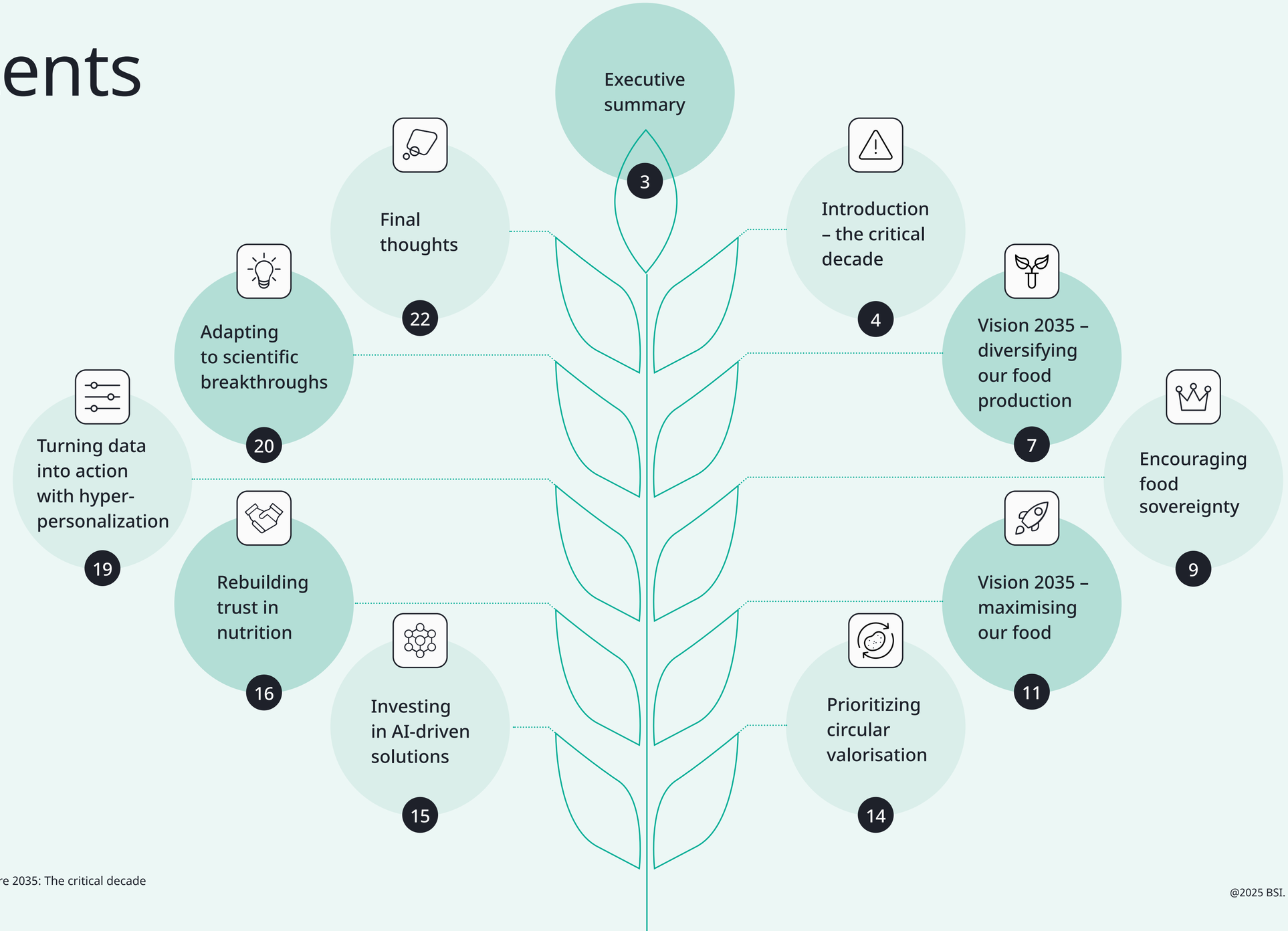


Executive summary

The world’s food system stands on the edge of its most defining decade yet. From climate change to nutrient decline, via geopolitics and food safety, the pressures shaping what we eat, and how we eat, are converging… and quickly.

The next decade will determine the future of our food systems, and collaboration and innovation will be key.

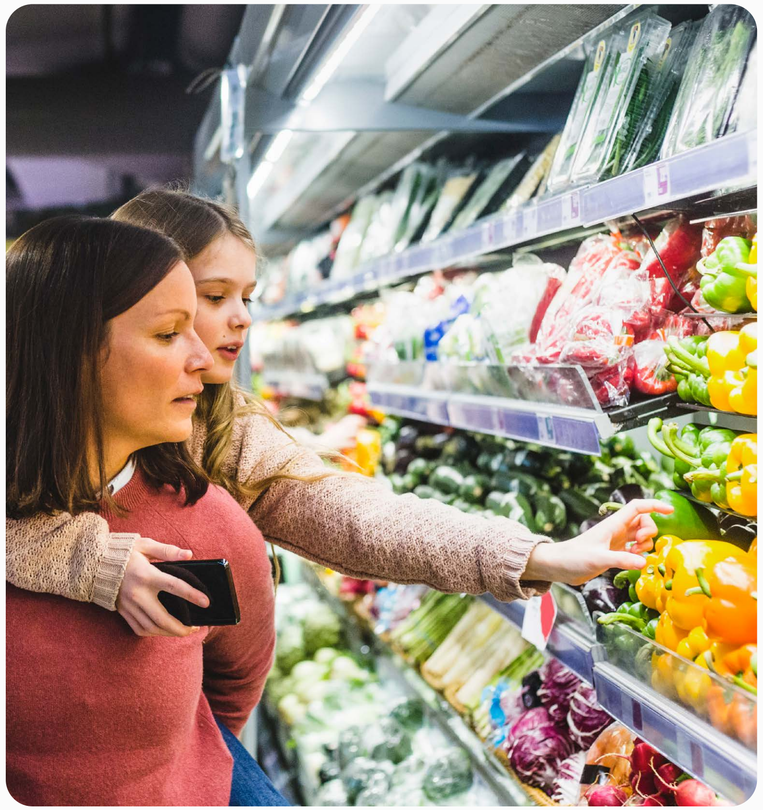
This is a call to action for everyone involved in the food industry, to help reimagine a global food system that’s fit for purpose in 2035.

Over the coming decade, we need to:

Rethink
how we produce food, reducing our reliance on finite resources.

Rebuild
soil health and restore trust, making sustainability measurable.

Reimagine
what we eat, aligning nutrition with human and planetary health.



Introduction – the critical decade

How we, as a sector, respond over the next ten years will determine whether or not we can feed the global population sustainably in the future.

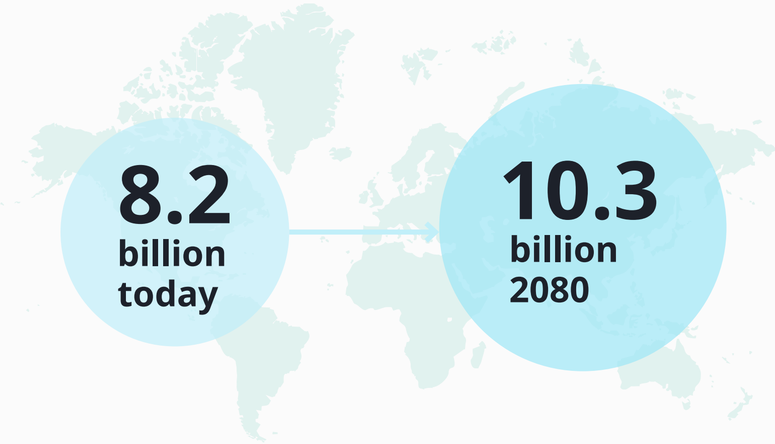
This white paper explores what the future could look like – and what it will take to get there.

Drawing on insights from BSI's Global Managing Director – Consumer, Retail and Food, Todd Redwood; Futurist for Food Tony Hunter; and the data-driven simulations of the future from Synthesis's Lee Fordham and Bilge Arslan, we present a framework for change.

Together, our experts reveal what's at stake for the global food sector, what change needs to happen now, and spotlight innovators that are already redefining what's possible.

Almost everywhere in the world, people are eating and wasting more food – but feeding them is becoming increasingly problematic.

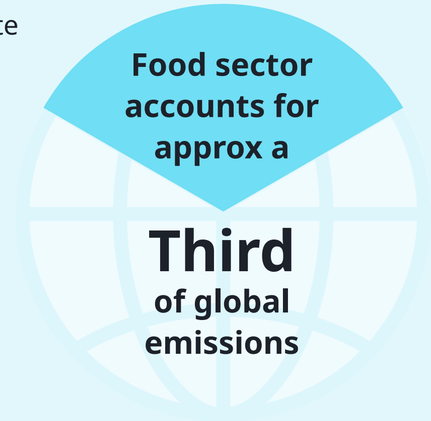
Global population growth projection



The global food system is under unprecedented stress, and the coming decades will see that exacerbated. This is a critical point. The UN projects global population will grow by over 2 billion people, from 8.2 billion today to 10.3 billion by 2080.

Meanwhile, soil degradation is reducing the soil's ability to produce as much as it once could. Soil degradation – defined by the Food and Agriculture Organization of the United Nations as 'a change in soil health status resulting in a diminished capacity of the ecosystem to provide goods and services for its beneficiaries' – is forecast to impact up to 95% of the world's soil by 2050.

The food sector in its present state and way of working is untenable in the long-term. It is a major contributor to the world's greenhouse gas emissions, accounting for around one third of global emissions, using significant freshwater, creating pollutants, and using around half of the world's land for agriculture.[1]



Demand is growing, resources are being depleted, and our climate is increasingly volatile. It's a perfect storm of intersecting crises. Which is why the next decade will be pivotal in establishing sustainable food systems that will enable the world to feed an ever-growing population, while reducing the impact the global food system has on the environment.

The global food system needs to change, and the next decade, while full of complexity and opportunity, needs to be one of action. Business as usual means failure, yet there is significant opportunity to seize.

Over the following pages we explore what needs to change in terms of how food is sourced, how we ensure it feeds the people it needs to, and how we can help the food that we do create have the nutrient value we need to thrive into the future.

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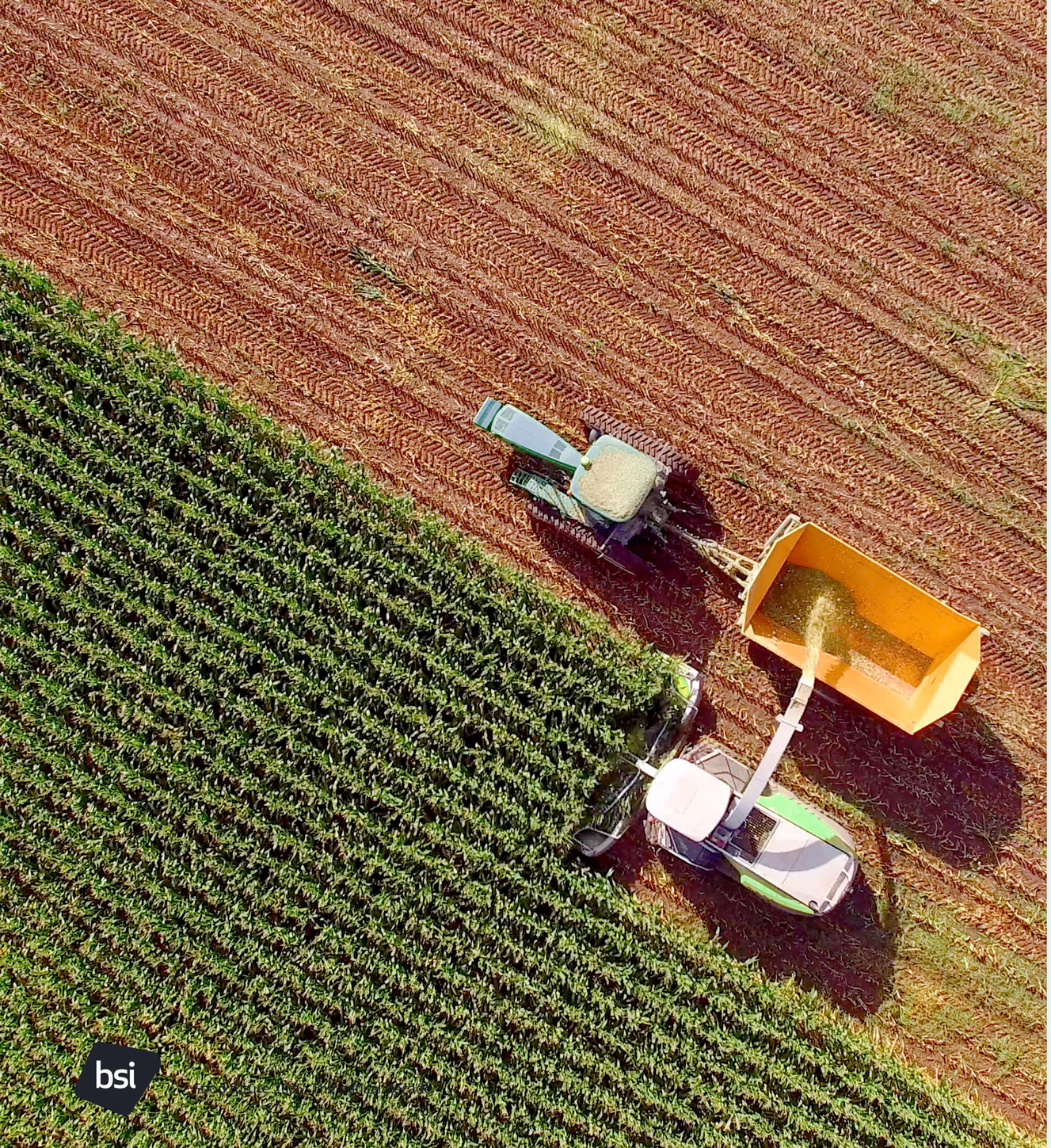
> "The food system is such a significant emitter of greenhouse gases, that even if the world stopped burning fossil fuels tomorrow, it would still push us past the 1.5 degrees Celsius threshold."
>
> **Todd Redwood: Global Managing Director – Consumer, Retail and Food, BSI**



The food system is such a significant emitter of greenhouse gases, that even if the world stopped burning fossil fuels tomorrow, it would still push us past the 1.5 degrees Celcius threshold.”

Tony Hunter: Global Food Futurist Speaker and Food Futurist Consultant at Future of Food Consulting

Knowledge and data are important, but knowledge doesn’t change behaviour. Our mission is to immerse people in the future based on 100,000 simulations of the world in 2035, and through dialogue and collaboration, spark change through clarity and shared vision.”

Lee Fordham: Founder, Synthesis

Vision 2035 – diversifying our food production

In order to meet global food needs of the future, we need to change how food is produced, reducing the strain on the environment and encouraging a more diverse diet. While a number of factors can influence this, there are three key drivers that, if widely adopted, would have a significant impact.

Prioritizing alternative proteins

Over the coming decade, the food sector needs to look beyond traditional methods of food production. We need to incentivize agriculture to prioritize resilience, biodiversity and resource efficiency while maintaining yield.
The reality is, the world's future food needs cannot be met by continuing on today's trajectory, so we must focus on technologies that minimize the use of finite resources, such as water, and land.

Alternative proteins present a powerful opportunity to transform the global food system while reducing environmental impact, improving food security, and driving sustainable economic growth. However, realizing this potential will require more than innovation alone. It will depend on collaboration, regulatory clarity and trusted frameworks that support safe, scalable development.
The rapid scaling of alternative proteins and cellular agriculture is essential – these innovations decouple the production of food from animal rearing and land use.

Making it happen: Scaling the production of alternative food technologies needs capital investment, and public confidence. We must develop frameworks to enable the credible verification of novel food production methods, including the food safety of bioreactors (physical, biological and chemical – plus allergen – hazards), input traceability, and validating environmental claims. This in turn creates trust with investors, regulators and consumers. From there, we need to take consumers on the journey to try alternative proteins, and ultimately be persuaded by the taste, quality, health and cost benefits of alternative foods.

Adopting regenerative agriculture practices

Regenerative agricultural practices help rebuild organic matter in soil and restore degraded soil biodiversity, which is integral in the long-term sustainability of our food systems.

Despite widespread awareness of and interest in regenerative farming principles, increasing consumer interest, and some companies such as Unilever that have made significant early progress in terms of implementation, there is a gap in terms of data and consistency.

The challenge is two-fold. The sector as a whole – including governments – need to incentivise and mandate regenerative agricultural practices. That can only happen when we have a worldwide, consistent and accepted definition of regenerative agriculture. One which ensure claims are measurable and auditable, with defined metrics for soil health and carbon sequestration.

Making it happen: Collectively, we need to establish credible carbon traceability and auditable soil and water stewardship metrics, and we need to put guidance in place to make regenerative farming techniques better understood and achievable. Only then will we see notable change.

Regenerative agriculture is a key component on many levels. Without moving to a regenerative cycle, we're probably going to destroy the earth."

Todd Redwood: Global Managing Director – Consumer, Retail and Food, BSI

Encouraging food sovereignty

Over recent years, geopolitical instability has demonstrated where significant weakness in the global food supply chain lies. For countries reliant on long, complex supply chains, trade routes can be severed in a moment, presenting almost unmanageable food security, economic and political risk.

While food security (the ability for a country to buy food globally) is well understood, food sovereignty (the ability to produce a reliable base level of food domestically) is less so. By producing and using more locally-produced food, including using new food technologies, it increases and secures domestic supplies as well as reduces the impact of interruptions in the supply chain.

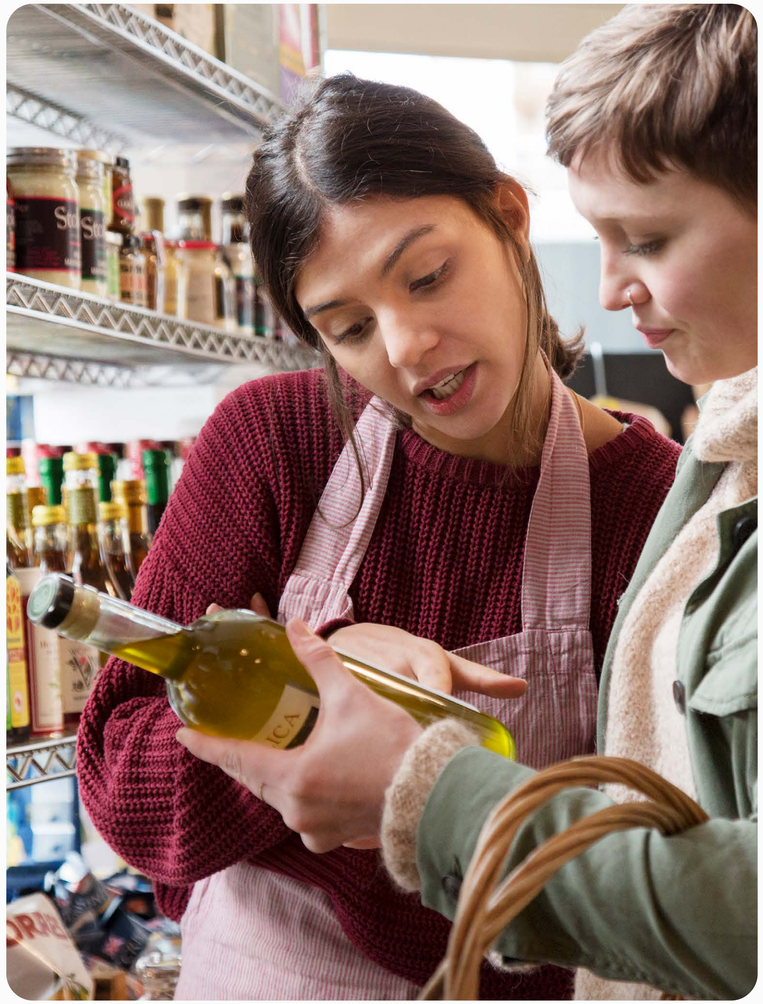
Making it happen: A strategic pivot to localized, resilient food production requires investment in decentralized food production models, such as vertical farming, community-supported agriculture (CSAs) or urban farms.

Decentralized models can have broader benefits, too – including converting waste streams, reducing transport loss, and enabling community engagement. Standards and guidance for energy efficiency of local farms, for example, and models that can verify local production, will be key in making this a reality.

Novel production models in action

Across the world, innovative companies are leading the way in alternative protein production and cellular agriculture. One example is the microbial protein Solein from Solar Foods in Finland. Their proprietary process uses water and gases from the air to grow microbes that can be dried and used to formulate products from ice cream to protein bars.

Australia-based company Vow produces meat products without the animal. They select cells from animals and use them to grow meat in large stainless steel fermenters, much like brewing beer. They use less land and water than producing conventional animal meat, potentially lowering the environmental impact of increasing meat consumption.



> Certain ingredients – for example, coffee, chocolate and olive oil – are going to be lost or certainly become harder to get, due to factors such as price. Therefore, we need to find sustainable alternatives."

Lee Fordham: Founder, Synthesis

> We need to produce more food, using less arable land, resources, and fresh water. Technology is key here, and can help us scale rapidly so we can start to fill that gap."

Tony Hunter: Global Food Futurist Speaker and Food Futurist Consultant at Future of Food Consulting

Vision 2035 – maximising our food

A perennial issue with our global food system is the amount of food lost and wasted – approximately one third of food produced by weight for human consumption is never used by a human, equating to an estimated US$1 trillion in losses.

As well as impacting how we meet the food needs of our global population, food loss and waste is also a major factor in global greenhouse gas emissions, accounting for 8-10% of global greenhouse gas emissions. For context, that is 5x the amount the aviation industry is responsible for.

A number of factors can help reduce food loss and waste, however, three critical things need to happen over the next 10 years in order to secure our food future.

The reality is, the world's future food needs cannot be met by continuing on today's trajectory, so we must focus on technologies that minimize the use of finite resources, such as water, and land.

US$1 trillion
in losses as a result of food wastage globally

Helping people build new habits

Reducing food loss and waste is easier said than done, of course, and a key challenge is changing the habits of consumers.

During the pandemic lockdown in the UK, there was a significant reduction in food waste, from 24.1% of food being wasted in November 2019 to 13.7% in April 2020 – demonstrating what is possible when people are at home more, and potentially have more time available. Those reductions, however, were not sustained, as post-lockdown food waste levels returned to previous levels – illustrating the deeply ingrained patterns of behaviour that are difficult to break.

5 x **more greenhouse gases are emitted through food loss and waste than the entire aviation sector**

> During the pandemic, we saw food waste go down. Take the lockdowns off, and food waste goes straight back to where it was before. It says it's an ingrained behaviour of our current household generation's lifestyle."

Tony Hunter: Global Food Futurist Speaker and Food Futurist Consultant at Future of Food Consulting

66% of people agree the food sector should prioritize circular practices, such as composting and reducing food waste.

A recent report from BSI, *The Tipping Point: Building trust in the circular economy*, found that while 85% of respondents had adopted behaviors to reduce food waste, 7% have never adopted this behavior (but would like to) while 5% have never adopted the behavior and don't expect to.

For businesses, there's a clearly proven return on investment of 14:1 when investing into reducing food loss and waste – helping create a compelling business case. BSI's research found 66% of people agree the food sector should prioritize circular practices, such as composting and reducing food waste, even if it would increase consumer costs.

Making it happen: Systemic behavioral change requires incentives or mandates – or a combination of the two – that make wasting food economically or practically difficult.

There are ways to help this happen. For example, South Korea's RFID smart bins, which charge households by weight, have seen the country increase household food waste recycling from 2% to 95%. The upcoming international standard (ISO/DIS 20001 - Food Loss and Waste Management) helps integrate food waste reduction into the way we manage our food system, supporting the transition towards increased sustainability.

> Korea, by comparison, has reduced waste and had enormous impact with mandatory separation of food waste since 2013 and RFID-equipped "smart bins" that weigh the food waste deposited and automatically charge the user's account. Over 95% of Korea's food waste is recycled for animal feed or bioenergy or a large percentage of soil conditioners."
>
> **Lee Fordham: Founder, Synthesis**

Prioritizing circular valorisation

Encouraging the use of products deemed unsuitable for sale in their current form, or byproducts or production that would typically be discarded, to create new food products is another key aspect to reducing food loss and waste.

Normalizing ‘imperfect’ shapes and sizes of fruit and vegetables – for example, Woolworths’ ‘Odd Bunch’ initiative in Australia – enables retailers to redefine expectations and help people form new habits. Establishing new products using currently wasted food, meanwhile, such as Dole’s Green Banana Powder and the Endless Food Co’s range of cookies creates new markets and reduces food waste.

Making it happen: To scale circular models, the industry needs consistent metrics, shared definitions, and globally recognised standards for waste reduction and valorisation. Food safety and the economies of scale are key challenges to address to make it easier to reuse than to buy.

Today, approaches differ significantly by country and category. With trusted international standards and independent verification, food businesses can confidently quantify waste reductions, validate circular sourcing claims, attract investment, and build consumer trust. BSI research found that a recognised label that supports and validates environmental claims would increase levels of trust in claims made by brands. Without that shared framework, the commercial potential of circular food systems remains locked.

Foundational frameworks such as BS 8001 (circular economy principles for organizations), BS ISO 59004 (vocabulary and principles), BS ISO 59020 (measuring circularity performance), BS ISO 59010 (business model transition), BS ISO 59014 (traceability of secondary materials) and BS EN 45560 (product circularity data sheet) guide organizations to define, measure and transition toward circular business models.

Investing in AI-driven solutions

Generative Artificial Intelligence (GenAI) can fundamentally change the food loss and waste landscape, reducing waste in the farming and production processes, and food loss in stores, restaurants and homes.

Technology such as dynamic use by dates can extend food shelf life, while AI forecasting tech, including Winnow Solutions (see breakout), can help reduce food waste in commercial kitchens by up to 50%.

Making it happen: AI platforms in general have been attracting serious investor interest in recent years – the food sector has the opportunity to take advantage. By telling the story of potential global effect, AI technology focused on reducing food loss and waste can bring both investment and humanitarian returns.

Creating new products from previously wasted food

By exploring the opportunities presented by previously lost and wasted food and ingredients, food businesses can reduce food loss and waste while diversifying revenue. Dole's Green Banana Powder is rich in resistant starch, potassium and magnesium, made from bananas that would have previously been discarded, while the Endless Food Co uses brewery byproducts to make nutrient-rich chocolate alternatives.

Rebuilding trust in nutrition

The next great challenge for the global food system isn't just about producing enough – it's about producing better. If we're to nourish a growing population, while improving long-term health outcomes, we must rebuild trust in nutrition, redefine what 'healthy food' actually means, and personalize food to individual needs.

Over the coming decade, we must restore nutrition to our food, realize the potential for data to have positive impacts on the food we eat, and adapt to new scientific breakthroughs.

Creating more nutritionally-valuable food

Nutrient density in many crops has declined by up to 50% over the last half-century due to CO2 levels, depleted soils, and breeding priorities. The world is producing more food by weight but less by nutrient concentration.

This demonstrates the need to provide clarity to consumers about the benefits, or otherwise, of what they're eating and the impact on their bodies. For example, the NOVA system of categorizing food by its degree of processing may be limiting. Over the coming years, a more granular understanding and appreciation of nutritional impact will see increasing demand and tools for personalized nutritional needs.

Current understanding of nutritional values – particularly around processed foods – need to be challenged and realigned. The sweeping notion of ultra-processed and processed foods being ‘bad’ is one that needs to be better understood.

Many ultra processed foods are designed – through flavor and salt content – to make people eat more, rather than them eating more because they’re not nutritionally satisfied. As people move further away from whole food diets, they eat more to satisfy their appetites, while at the same time getting less nutrition.

This creates a double burden of growing obesity and health challenges, including Type 2 diabetes, and ‘hidden hunger’, where people lack the macro and micro nutrients they need, such as fiber, iron and zinc.

Restoring nutrition to our food – through methods such as biofortification, novel fermentation, and functional ingredients – is essential to closing the ‘hidden hunger’ gap, and achieve beneficial long-term health outcomes.

“I am not a fan of the NOVA classification of food. To say that you can classify the nutritional value of food along a single axis of processing is, from a food science perspective, a ludicrous assertion to make.”

Tony Hunter: Global Food Futurist Speaker and Food Futurist Consultant at Future of Food Consulting

The NOVA processed food classification – and its oversimplified public perception that ‘ultra processed equals bad, minimally processed equals good’ – needs to be replaced with a more transparent, evidence-based framework that captures nutritional value, safety, environmental impact and verified health outcomes.

For instance, the UK’s Nutrient Profiling Model (now being updated to reflect evolving science) distinguishes between processing for safety or accessibility, such as fortified cereals or pasteurized dairy, and processing that simply increases sugar, salt or cosmetic additives.

This shift matters. Without nuance, policymakers risk targeting the wrong products, manufacturers are rewarded for superficial reformulation, and consumers are left with confusion instead of clarity.

A more robust classification allows governments to regulate effectively, brands to innovate responsibly, and consumers to make informed choices based on real nutritional benefit, not fear.

Of course, nature-based solutions, which use the power of ecosystems – forests, soils, oceans, wetlands, farms and cities – to solve climate and sustainability challenges, while supporting biodiversity and human wellbeing, have to come into the thinking too.

With soil nutrient density declining, it’s essential landowners are encouraged and incentivized to rebuild soil’s nutritional value – and see soil health as being integral to human health. Practices such as regenerative farming, compost integration and nutrient management can help restore soil biodiversity and rebalance micronutrients.

Making it happen: Nutritional information needs to be standardized, verified and scientifically assessed – moving the conversation around nutrition from fear and conjecture to verifiable, auditable science. Standards for nutritional transparency, functional claim validation and ingredient traceability can safeguard consumer trust, while simultaneously driving growth.

Turning data into action with hyper-personalization

Personalized digital services are expected by consumers today, and the data gained from bio-wearables, sensors, tattoos and implants – combined with GenAI – is delivering hyper-personalization. This can be a significant benefit, and help with better nutrition and health outcomes by delivering nutrition that's suitable for our individual genomics, microbiome and other lifestyle parameters.

With GenAI, virtual physiological twins can be created, analyzing the impacts of the many foods an individual consumes each year.

There are many potential positives, and AI has a key role to process numerous data points and translate into meaningful action.

Key challenges that will need to be tackled, however, centre around how this data is audited, how advice given is controlled and ensuring algorithms recommend products, free from commercial influence.

If successful, this could reduce food loss and waste by decreasing food intake and in-home wastage, as well as helping people lead healthier lives, positively impacting on health services.

Making it happen: Implementing AI solutions in line with standards for ethical data governance and algorithmic transparency are key to earning consumer trust, while dietary recommendations have to be made in line with agreed protocols.

> With personalized food plans, does the concept of a family dinner go out of the window?"
>
> **Todd Redwood: Global Managing Director – Consumer, Retail and Food, BSI**

Adapting to scientific breakthroughs

As science evolves and develops, the food sector needs to keep up and evolve alongside it. Recent developments, such as GLP-1 drugs – for example, Ozempic – are a major variable that the sector needs to adapt to.

The widespread adoption of GLP-1 drugs would see appetites reduce while potentially creating significant nutrient deficiencies. This could lead to opportunities for food producers to reformulate, creating more nutrient-rich food in smaller portion sizes.

Following the scientific thread, the sector needs to challenge negative sentiment on genetically modified organisms (GMOs) and gene-edited foods. Random mutagenesis using radiation and mutagenic chemicals have been used for more than a century, and is considered a traditional method in the EU – thousands of food plants have been produced using these methods, and GMOS will be needed to meet future food demand.

Making it happen: Food manufacturers should consider the impact of GLP-1 intervention on nutritional need and portion demand, and explore reformulation. The reeducation of the public on GMOs is of paramount importance to help meet future food demand.

Harvey and Harvetta – virtual metabolic humans

Harvey and Harvetta, whole body, computational male and female models, represent whole-body metabolism, physiology, diet and the gut microbiome.

These new models successfully predict known biomarkers of inherited metabolic diseases and enable exploration of potential metabolic interactions between humans and their gut microbiomes at a personal level.

This means that targeted dietary and microbial strategies can be developed, and sex-specific disease development and progression can be better understood.

> I don’t think there is one big F&B company in the world not looking at the impact of GLP-1s at the moment.”

Lee Fordham: Founder, Synthesis

Final thoughts

The next decade is defined by this truth: Business as usual means failure.

Together, the pressures of climate volatility, geopolitical risk, and resource scarcity have pushed the global food system to breaking point – it's simply not sustainable, and we have a responsibility to act.

We have to find answers to the questions:

Where will we source food to raise production in a resource-challenged world?

How can we stretch the resources we already have to accommodate a growing population?

How do we nourish future generations in a world that's overfed, but undernourished?

This is a critical period, however within it lies the greatest opportunity for transformative leadership.

There are many technology and nature-based solutions within reach, and all stakeholders need to come together to enact change.

Company leaders need to take a long term view of the future, rather than the usual one-three years, and it's essential that senior management and boards take control – understanding the impact of new food technologies is not something that can be delegated to the technical department.

However, that change cannot happen without trust – which is why standards play such an important role.

BSI works with stakeholders at all levels to provide the invisible infrastructure of trust in the form of consistent, verifiable standards that translates foresight into auditable business practice.

This is a complex issue, and we need to act now, because the rate of change will never be slower than it is today. We need to collectively take constructive action. Connect with BSI to help secure your organization's role as a leader in building a resilient, sustainable, and nourished world by 2035.

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