



Appetite for disruption – Making the most of the future of food

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Being the leader of a global food and beverage business has been anything but easy over recent years. Going back a decade, the industry had a reputation for being fairly stable and conservative, dominated by a limited number of global brands that delivered steady growth and margins. Since then, the industry has been shaken by a succession of disruptions, including sluggish demand for traditional core products, rapidly changing consumer patterns and preferences, accelerating technological developments, and evolving attitudes towards the environmental and social impacts of food production. The pandemic has added yet another ingredient to the mix, only serving to accelerate many of the trends that already existed, such as digitalization and personalization.



The business space a large food company operates in has become more complex, with an increasing degree of convergence across the different steps of the value chain from farm to fork, associating with other industries such as pharmaceuticals, logistics, appliances and kitchen automation, as well as between relevant technologies from nutrition and gene editing all the way through to digital technologies and advanced and/or smart materials. On top of this complexity, many of these enabling technologies are so-called exponential technologies: they progress very rapidly.

The food value chain has changed dramatically over recent years – and promises to continue transforming, with ecosystems becoming ever more complex. Based on a comprehensive study carried out with three major players in the food value chain, the authors explore the trends and scenarios shaping the future of food.

Setting a strategic course in this type of dynamic environment is challenging, but looking forward there are many great opportunities for breakthrough innovation to drive new growth. With this in mind, three leading companies in the food value chain commissioned Arthur D. Little's recent acquisition, Presans, to conduct a study into future trends in the food industry, building on their own extensive knowledge. The companies were Danone, one of the top food companies in the world; Bonduelle, one of the world's top vegetable processing companies; and SEB, the global leader in small domestic appliances.

In this article we present a high-level summary of the study, which addressed some key questions:

- What are the key trends in usage and enabling technologies?
- What could these mean for future scenarios?
- What priorities are important for companies in the food value chain to focus on?

About the study



Presans, an ADL company, conducted a major study of future trends in the food industry over a period of six months during 2020, together with leading international food industry players Danone, Bonduelle and SEB. The study focused on identifying usage trends and scenarios in the context of the overall value chain, as well as enabling technologies and how they link to these scenarios.

The methodology was expert-based, following Presans' "Synergy Factory" approach comprising three stages:

- 1. Alignment of objectives:** Understanding, refining and agreeing the objectives of the study across the three companies

2. Securing experts: Identifying, qualifying and engaging top worldwide experts, starting with 935 initial expert contacts, of which 46 experts across 18 countries submitted proposals

3. Collaborative implementation: With close collaboration facilitated by Presans, a series of expert reports was developed, synthesized and integrated into an overall analysis and a set of common conclusions

Based on the analysis, 24 specific trends were identified and characterized, and four future scenarios were derived relating to both changes in usage (consumer) patterns and the nature of the food value chain. At the intersection of trends in both usage and technology across the scenarios, a series of priorities were identified for food companies to focus on for future success. In this article we are able to share only the high-level results that were deemed not confidential to the three client companies. We are very grateful to Danone, Bonduelle and SEB for their inputs, cooperation, advice and active involvement in the study.

“Beyond the content generated through the Future of Food project, the collaborative approach set up by Presans with SEB and Bonduelle, two other corporate leaders in the food industry, has been exceptionally rich. This type of synergy is at the heart of Danone’s strategy and of its execution: a recent example is our partnership with the American start-up How Good, with which we have co-developed a tool to help design our recipes to understand the environmental and societal parameters linked to the ingredients used. Complementary assets and a wealth of points of view are the keys to the success of innovation in a changing world.” [Danone]

“We can’t predict the future, but we can prepare for it. Collaboration with Danone and Bonduelle, combining our respective innovation paths, allowed us all to build a broader vision and be ready for the forthcoming challenges.” [SEB]

“The magnitude of the challenges facing the food system is huge and no single player can pretend to solve it on its own. Partnering with other players like SEB or Danone is essential to envision the future of food and what opportunities could

arise from bringing together technology and consumer expectations. It has proven to be very successful to share what each of us considers to be the certain future and to explore together what a not-so-certain future could look like.”
 [Bonduelle]

The trends shaping the future of food

It is helpful to consider the trends shaping the future of food in three categories: Usage or consumer trends, food technology trends and, considered separately because of its scale and diversity, digital technology trends¹. In the study no less than 24 discrete trends were identified, as shown in Figure 1.

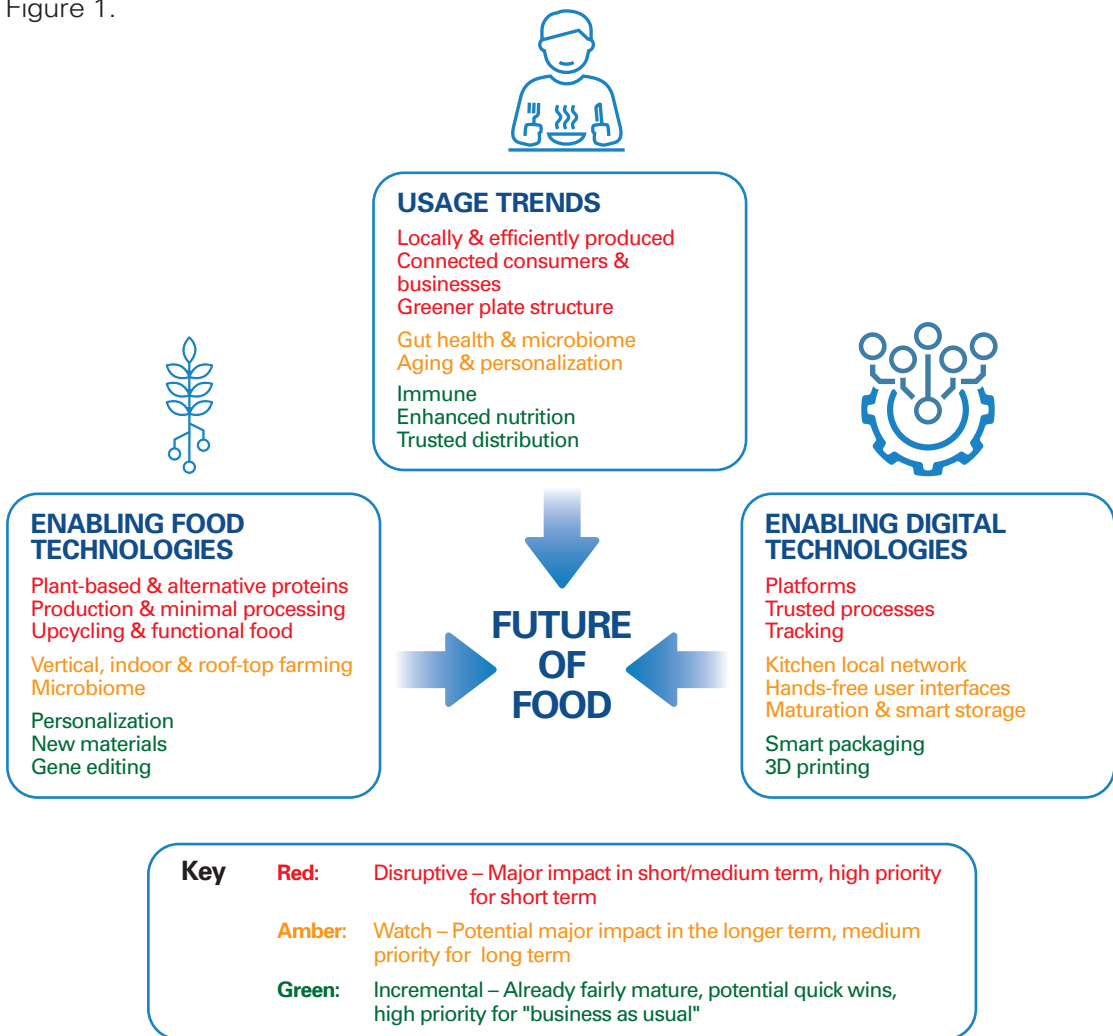


Figure 1: Trends shaping the future of food

1. Trends in advanced materials and packaging are also relevant, but were not included in this study

The trends were classified in terms of scale of disruption potential and maturity to identify those which were Disruptive (rapidly developing, key for the short term), Watch (potential for major impact in the longer term) and Incremental (already fairly mature, important for quick wins and “business as usual”). Although it is beyond the scope of this article to go into the details of all 24 trends, there were some clear overall messages about what food companies should focus on for the future.

Usage trends: To remain global, companies need to become more local and connected

Among the usage trends, the three that are most disruptive and key for the short-term roadmaps of food companies are Localization of production, a Greener plate structure and Connected consumers and businesses.

Consumers increasingly value regionality and seasonality, minimal processing and packaging, small producers, upcycling and waste stream management. They are also looking for fewer additives, more plant-based food with high quality (including gene-edited), and good-tasting plant proteins replacing meat and dairy. At the same time, consumers are already becoming much more connected and active digitally, in terms of both how they purchase and how they source information about food. They will increasingly build trust within communities and opinion formers rather than merely accepting information from global brands. For example, the “r/food” community on Reddit has 19.5 million subscribers and is the 19th most popular on the platform. Networks such as the Open Food Network and collective purchasing platforms such as Pool.Farm are extending the notion of farmers’ markets into the digital realm. Small businesses will be increasingly part of the value chain, and there will be increasing use of dark or ghost kitchens (preparing food for direct delivery). These trends, which to an extent already existed, have been further accelerated by the pandemic.

This means that to stay successful at a global scale, large food companies will need to become much more local in their operations, with greater leverage of local suppliers and distributors, more tailoring to suit local needs, and more emphasis on engaging and connecting locally with consumers. These things can be difficult for large companies to achieve at scale, requiring innovation and, in some cases, transformation to remain competitive.

Food technology trends: Taste, texture and quality of alternative foods are key drivers

The most disruptive food technology trends are shown in Figure 1 as Plant-based & alternative proteins, Production and minimal processing and Upcycling/functional food.

Ever-increasing environmental and sustainability pressures are driving food production towards the use of proteins other than meat, including plant-based, fungal or insects. For example, plant-based meat alternatives have already grown quickly at rates of up to around 30 percent in the last two years. This also means that new production and processing technologies such as fermentation technologies, gene editing, process enzymes, and soil microbiome science will become increasingly important. Upcycling and avoidance of food waste is also rising on the social and political agenda, requiring new technologies such as 3D printing to create new functional foods. However, there are still major consumer barriers towards acceptance of these alternative foods instead of conventional products – they just don't taste as good. It is therefore key for food companies to innovate around how to create the taste, texture and quality attributes that consumers value and expect as the shift towards alternative and functional foods progresses.

**Digital technology trends: “There are two types of
companies – tech companies and dead companies”**

In the category of digital technology trends, Platforms, Trusted processes and Tracking emerge as the most potentially disruptive.

What we mean here by a platform is the ability to support the entire business with a unified digital platform infrastructure, enabled by new data analytics technologies such as artificial intelligence and machine learning. As food companies vastly increase and extend their partner networks (see also the usage trends above), as well as with ever-increasing consumer and regulatory standards and expectations, it is essential to be able to provide the necessary assurance, trust and traceability along the entire chain from farm to fork – blockchain technology has applications in this field. To maintain and improve efficiencies, companies will need to embrace technologies in remote sensing and automation. To be responsive and dynamic, they will need to be able to connect seamlessly with consumers, producers, suppliers, co-manufacturers, distributors, retailers and other value chain partners.

The quote above, “There are two types of companies – tech companies and dead companies,” from US professor Gregory Leblanc at UC Berkeley, may sound dramatic, but it is scarcely an exaggeration.

Characterizing the future

Based on these trends, an expected future in a five- to 10-year time frame can be characterized in terms of four scenarios, as shown in Figure 2.

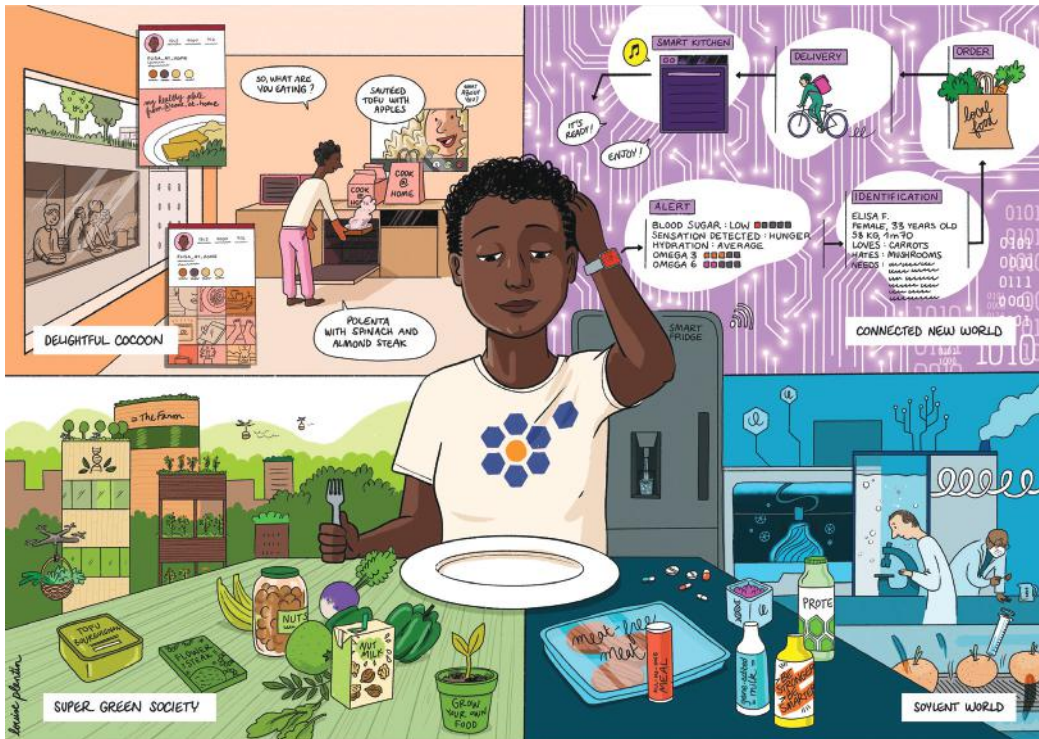


Figure 2: Future of food scenarios, © Louise Plantin, Presans (2021)

These scenarios should not be seen as alternative futures, but rather complementary and interconnected aspects of an expected overall picture. All aspects should therefore be considered in any long-term strategy, although the emphasis for each company will vary depending on its role, vision and strategic positioning.

1. Super Green Society

At the bottom left, and closest to where we are today, is the “Super Green Society” scenario. Here, environmental sustainability issues continue to rise in prominence. Awareness of the impact of eating habits on the planet

increases, and the consumer's plate becomes greener, with alternative proteins, local production, natural, and "free from" increasingly coming to the fore.

Supporting the drive towards plant-based and non-animal food is a clear priority in this scenario. The plant-based meat global market has been forecast to grow at nearly 20 percent annually over the next six years, from \$3.3 billion in 2019². There are many opportunities to innovate, such as health-beneficial foods for seniors, fermented foods, and waste reduction through new treatment technologies and packaging.

2. Delightful Cocoon

The "Delightful Cocoon" scenario reflects a significant shift in how consumers eat in the post-pandemic world. In a reflection of the increasing desire for personalization and individual well-being in a world where risks and threats are ever-present and increasing, in this scenario consumers spend nearly all their time at home, including meals. The offering for domestic meals has become increasingly sophisticated, with more use of ghost or dark kitchens and finishing at home, enabling almost any style and quality of food to be enjoyed. Some aspects of this scenario are already with us, driven by the pandemic.

In this scenario, there are opportunities to leverage the growth in on-demand food. According to Euromonitor, ghost kitchens are expected to replace 25 percent of in-store beverages and 50 percent of takeaways, growing to \$1 trillion by 2030. Companies such as Gorillas and Getir are examples of new service providers that deliver fresh groceries and local brands to the doorstep in 10 minutes. Getir, currently valued at \$7.5 billion, now operates in Turkey, the UK, Germany, France and the Netherlands, and is looking for expansions in the US and Brazil.

2. Source: Grand View Research market analysis report, September 2020

3. Soylent World

In this scenario the concept of synthetic, engineered food has become the norm. Gene editing is broadly used to bring new properties and benefits to food and raw materials, such as taste, texture, health and reduced environmental impact. Milk, meat, and vegetables are grown in vitro and 3D printed. Such food is currently a long way from consumer acceptance, although it is likely to be an increasingly significant part of the plate in light of future pressures on the environment and the world's resources. It may be some years before these pressures are sufficient to override consumer acceptance barriers.

In the meantime, there are many innovation opportunities in gene editing, also in combination with functional foods to deliver personalized health impacts enabled by digital technologies. For example, Nestlé is constructing new businesses that provide optimal nutritional solutions based on individual biological and behavioral data. Partnering is a key aspect of providing these types of solutions, including data and technology specialist companies to enable acquisition of data, development of new assays for nutritional status measurement, and development of new equipment.

4 Connected New World

Finally, the "Connected New World" scenario envisages full digitalization across the entire food value chain, from farm to fork. In this scenario, social media has accelerated the growth of narrow communities representing specific interests, concerns and food experience desires. Digital technologies have enabled the scaling up of personalization and significantly improved health and sustainability. Some aspects of this scenario are already with us today, although there is still a long way to go.

There are already many examples of digital platforms operating at the consumer interface. One such example is PepsiCo's use of integrated B2B and B2C customer engagement tools to allow consumers to participate in

promotions and awards directly from a mobile phone scan from their local mom-and-pop store. Another example is the Internet of Things technology used by Coca-Cola bottlers in smart coolers to remotely track productivity, security, and stock levels and to boost sales.

Insights for the executive – Ensure a clear innovation vision and purpose

The food value chain is facing more disruption than at any time in the past, and the pace of change is accelerating. The four scenarios outlined are expected to be complementary aspects of this future, and companies need to take action now and in the coming years to anticipate their implications. The strategy to pursue will differ depending on each company's position and role in the food value chain – it is not possible to suggest specific innovation priorities that would be generically applicable. At a high level we suggest a four-step approach to identify the way forward, as shown in Figure 3.

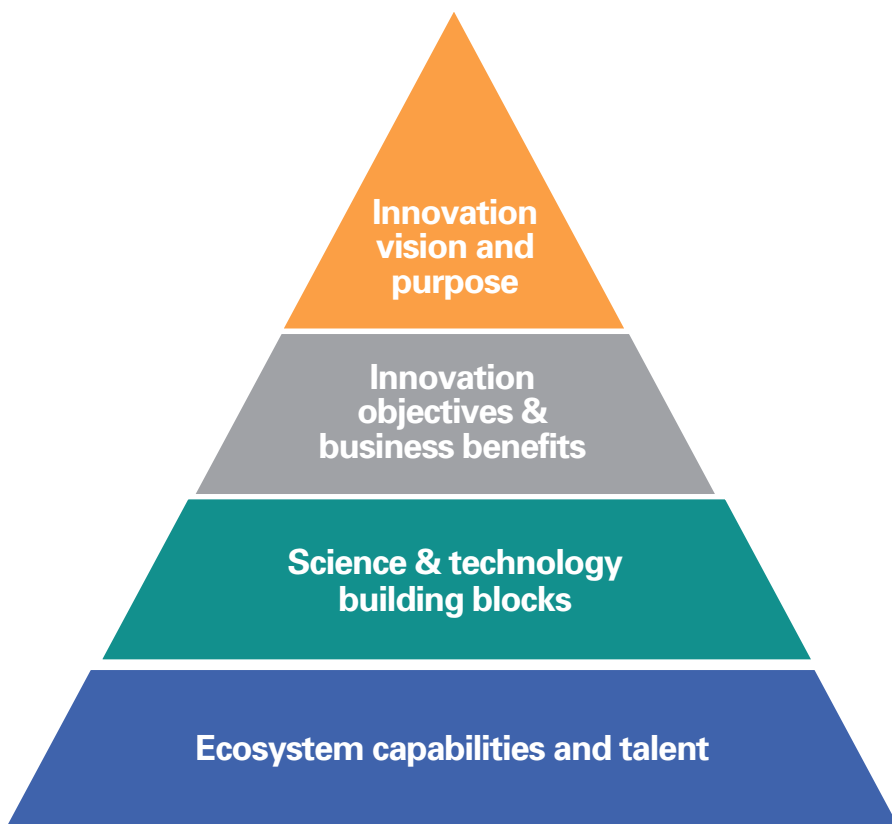


Figure 3: Innovation framework

- Define a unique and clear vision **of what research & innovation should bring to the company** and to the world. The innovation purpose should be aligned with a higher company sense of purpose or “raison d’être”. This needs to be defined at a higher level than merely the products and services that the company currently offers. Such a vision can be used to develop a strategic positioning that is focused in terms of the role(s) to be played in the value chain, yet also flexible enough to enable a stretch towards radically new products and services. Depending on the positioning, this may align with one, or a combination, of the four scenarios.
- Based on the innovation purpose, define the specific **innovation objectives** to pursue, and identify and qualify the business benefits to customers, stakeholders and society. In this sense an innovation objective could be defined around, say, improving the taste, texture and appearance of plant-based food, or reuse of food waste.
- Use the innovation objectives and scenario alignment to help guide which specific **science and technology building blocks** to pursue. These will normally form the main content of the company’s research and technology roadmaps.
- Build and engage **capabilities** and talents from within the company and, perhaps more importantly, the broader partner ecosystem to develop and pursue the science and technology building blocks.

Defining a strategic direction in a rapidly changing environment is challenging. Perhaps paradoxically, it is usually those companies with the clearest and strongest sense of purpose that are best able to adapt and transform themselves to meet the needs of the future.

“Consumers’ expectations and behaviors are moving faster than ever before and the pandemic has accelerated pre-existing shifts. It is absolutely critical for us to build scenarios of the future to inform today’s investment decisions and to be prepared to reinvent ourselves.” [Danone]

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