

# CHAIN REACTIONS

## THEMATIC BRIEF BIOECONOMY

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Innovation in the European agrifood sector

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# Innovation in the European agrifood sector

## The need for action

World population is constantly growing with an expected population of around 9 billion people by 2050. The global society is facing major trends such as climate change, water scarcity, biodiversity loss and political instabilities. These challenges will shape the future of food, how it is produced, delivered and how it will influence the livelihoods of people. At the same time, technological developments are speeding up with new possibilities growing exponentially and consumers who are better informed than ever before and becoming more and more diverse in their opinions and demands.<sup>1</sup> The Covid-19 pandemic has shown us dramatically how important a robust and resilient food system functioning in all circumstances is for ensuring access to a sufficient supply of affordable food for citizens. It has further demonstrated interrelations between health, ecosystems, supply chains, consumption patterns and planetary boundaries making it clear that global society needs to do much more to keep themselves and the planet healthy in the future. This need for action is clearly outlined by the strategy “From farm to fork” of the European Union which can be understood as a new approach to ensure that agriculture, fisheries and aquaculture, and the food value chain contribute to the process of reaching the objective of a climate neutral Union in 2050. This is reflected in new opportunities that arise from:

- ensuring that food production, transport, distribution, marketing and consumption, have a neutral or positive environmental impact, preserving and restoring the land, freshwater and sea-based resources on which the food system depends as well as helping to mitigate climate change and adapting to its impacts,
- ensuring food security, nutrition and public health – making sure that everyone has access to sufficient, nutritious, sustainable food that upholds high standards of safety and quality and additionally combining it with plant and animal health,
- preserving the affordability of food, while generating fairer economic returns in the supply chain, making sustainable food affordable for many people.<sup>2</sup>

In the following, changing consumer needs and available foresight scenarios to tackle these needs will be analyzed putting them in relation to the above-mentioned opportunities of the European strategy “From Farm to Fork” concluding with a look at how Covid-19 acts as accelerator for transformation on the European agrifood sector.

## Changing consumers

Both the mindset and behavior of consumers is rapidly changing, heavily influenced by the above-mentioned global trends and challenges as well as by new technological developments. The whole food value chain needs to be re-organized following the concerns of consumers which will be outlined hereafter:

<sup>1</sup> Katana – Cutting edge tech in agribusiness “Trends, technologies and outlook in the agrifood sector”, final compilation of previous work within the H2020 KATANA project ([www.katanaproject.eu](http://www.katanaproject.eu)), p.4.

<sup>2</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, A Farm to Fork Strategy for a fair, healthy and environmentally friendly food system. Brussels, 20.5.2020, COM (2020) 381 final



1. **Health:** Consumers ask for healthy food that is ideally tailor made to their individual needs (“personalized nutrition”). Food is seen as both a mean to cure as well as to preventing diseases.
2. **Environment:** Consumers ask for environmentally and socially sustainable foods that are local, organic, plant based. They care for fair trade and animal friendly productions. The number of vegetarians, vegans and flexitarians is growing constantly. This concern goes along with demand for biobased and biodegradable packages as well as smart labels and smart fridges to reduce food waste.
3. **Fresh and clean:** There is a growing demand for fresh food for sustainable and health reasons. In the same time, distrust in food industry is growing as well as the desire to understand each component that goes into food.
4. **Novel experiences:** Consumers are looking for enjoyment in all elements of their life, this also applies to their nutrition. They want to discover new food experiences, ethnic flavors from around the world as well as unconventional flavors and novel varieties. In terms of food production, this comes along with multi-sensory drinking and eating experiences, surprising textures, visual appeal, playful packaging and new food locations where food consumption is celebrated as community event.
5. **Convenience:** 25% of global consumers are looking for products that make their life easier, they ask for convenience to balance their complex and busy lives. Convenience has multiple interpretations depending on individual and habits. Combined with new technological possibilities, this can come with new gadgets such as a smart fridge that directs consumer in what they buy and eat or quick delivery systems, smart kitchens, meal boxes containing recipes and ingredients for easy and fancy home cooking.
6. **Transparency and traceability:** Distrust in food industry leads to an increased interest in tracking and tracing of food. Apps, smart labels and websites are used to check how and where food is produced.
7. **Food safety:** Even if most consumers have confidence in safety of food supply, the increased awareness for food safety changes habits with demands for smart packaging and smart labels for tracking and tracing, showing stories, shelf-life, ingredients, allergy information, recipes, etc.
8. **Logistics:** Consumers ask for novel home delivery systems, ideally with self-driving vehicles. The whole food distribution chain is challenged by food e-commerce with direct delivery from farm, new players such as amazon and the overall consumer demand for quick delivery.<sup>3</sup>

The illustration below describes the consumer with all its concerns and demands related to the food system in a holistic way:

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<sup>3</sup> Katana – Cutting edge tech in agribusiness “Trends, technologies and outlook in the agrifood sector”, final compilation of previous work within the H2020 KATANA project ([www.katanaproject.eu](http://www.katanaproject.eu)), p.6.



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**Figure 1: The consumer**

**Source: KATANA Final report**

### Foresight scenarios for the agrifood sector

In its final compilation, the experts of the H2020 project KATANA – cutting edge technology in the agrifood sector, summarized the most common topics that were covered across different foresight scenarios which tackle the above outlined new consumer needs. The major findings across various foresight scenarios for the agrifood sector are outlined below:

1. Foresight scenarios for “Mobile services”: new technologies are expected to drastically change the way food is produced, delivered and perceived by the consumers. In various foresight scenarios, food and services are exchanged through online platforms without a middle step in the chain, making it possible for regional producers to reach the world. Even if retail still exists, it is expected to take place mostly online. In some foresight scenarios the consumers are not even involved in food purchases anymore. Instead it is the smart kitchen that calculates the needs and automatically places orders, while even food preparation is automated. In these



scenarios, wearable devices track the dietary needs and help with dietary choices. In parallel, novel and smart packaging solutions and labels provide a constant stream of information regarding safety, ingredients, origin and quality of the product.

2. Foresight scenarios for Precision farming: foresight scenarios for farming predict that synthetic biology and other high-tech solutions would be widely used to assist farmers to enhance yields and reduce use of energy and other resources. Further to that, novel pesticides and fertilizers would decrease food losses. Another concept highly discussed in different scenarios is the urban farming approach where citizens tend to grow their food themselves, on balconies, terraces or walls.
3. Foresight scenarios for Functional food: in these foresight scenarios, personalized nutrition is facilitated by smart devices that indicate human nutritional needs. In some scenarios, cooking is replaced by fortified ready-made food, rich in all the necessary nutrients per portion. Consequently, new food sector companies often appear as a merge between food and pharmaceutical companies, that produce foods with pharmaceutical ingredients called 'phoods'. In a future busy life, convenience is always important, benefitting the development of easy meals, sometimes even powders that are ideally designed to cover the specific needs of everyone. This means that highly specified foods with special micronutrients and macronutrients would be available based on age, gender, allergies, deficiencies, genotypes or physical activities. Finally, a major future trend described is 3D food printing which is presented in different ways, large scale industrial printing, restaurant printing or home meal printing.<sup>4</sup>

### Covid-19 impact

As it is probably the case for all sectors, COVID-19 has also put an enormous strain on the European food system. Looking at first studies available, we can observe that during the COVID-19 disruption, manufacturing of food products and beverages was one of the most resilient industries in terms of recorded production (here in the example of CEE countries). In April 2020 due to lockdown measures production in many sectors fell while production of foodstuffs in CEE countries was only about 13% lower compared to April 2019.<sup>5</sup>

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<sup>4</sup> Katana – Cutting edge tech in agribusiness “Trends, technologies and outlook in the agrifood sector”, final compilation of previous work within the H2020 KATANA project ([www.katanaproject.eu](http://www.katanaproject.eu)), p.3.

<sup>5</sup> EIT Food: Food Foresight: Impact of COVID-19 on the agri-food sector in Central and Eastern Europe, Deloitte Poland, 2020



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Production of selected goods CEE GDP-weighted average	March 2020 as % of March 2019	April 2020 as % of April 2019	May 2020 as % of May 2019	June 2020 as % of June 2019	July 2020 as % of July 2019
Manufacture of capital goods	81%	51%	65%	84%	93%
Manufacture of durable consumer goods	84%	57%	79%	101%	112%
Manufacture of non-durable consumer goods	98%	84%	91%	96%	98%
Manufacture of food products and beverages	104%	87%	93%	98%	101%

**Figure 2: COVID-19 Heat Map - Manufacturing Output**  
Source: Deloitte, Eurostat

Even if the agrifood sector has been one of the stable sectors in terms of production, EIT Food’s Food Foresight report identified three major areas within the agrifood sector where COVID-19 would have primary impacts: the real economy, the financial sector and changes in behavior and expectations. They refer to a higher demand from the agrifood industry for capital to maintain liquidity, to increased uncertainty and risk aversion among consumers, and to increased uncertainty among policymakers that would lead to the implementation of food protectionism measures.<sup>6</sup>

When it comes to changing European food behaviors, a survey of 5,000 consumers in Spain, Sweden, Germany, UK, Poland, Italy, France, Greece, Finland, Romania demonstrates how lockdown measures have caused lasting behavioral change in relation to food consumption such as shifts in shopping patterns, meal preparation and eating habits. The research was carried out by a consortium of leading universities in Europe, led by Aarhus University, Denmark: even if consumers across Europe suffered financial cuts during the year 2020, European consumers reported buying more in almost every food category due to lockdown measures and rise in homeworking which led people to spending more time at home and eating out less.

The largest behavioral change was the way consumers shop, with nearly half of them reporting an increase in online shopping (45%); bulk purchases (47%); and carefully planned shopping trips (45%).

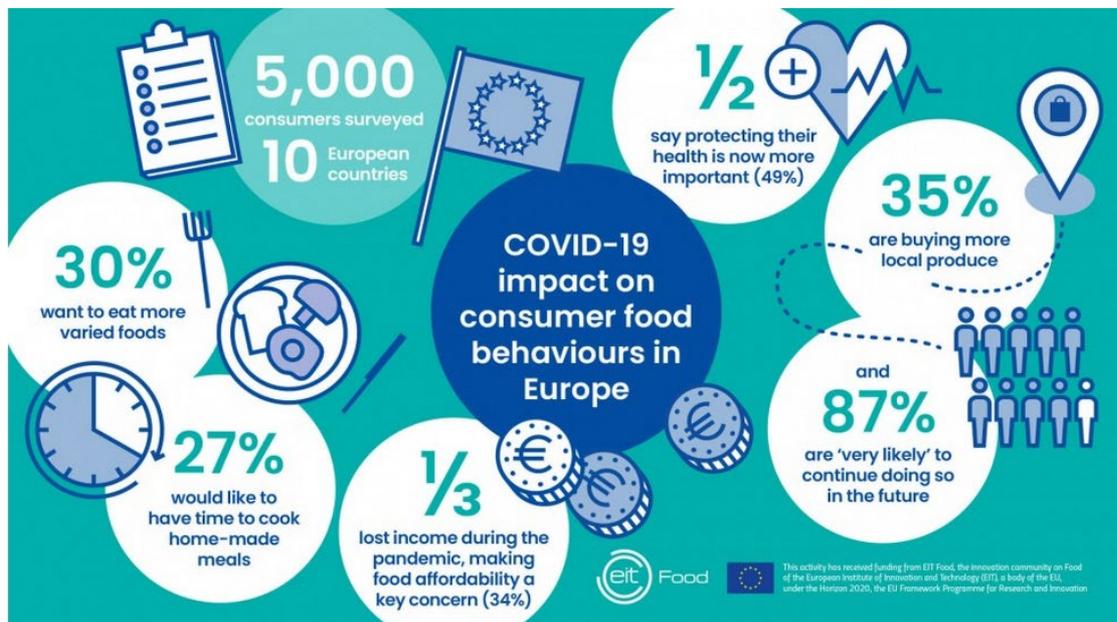
Further to that, European consumers are spending more time in the kitchen with over a third (36%) reporting that they have enjoyed spending time cooking during lockdown. Sharing this experience with others became more important too, with three in ten (29%) sitting down to eat together as a household more regularly.

<sup>6</sup> <https://www.eitfood.eu/blog/post/crisis-vs-opportunity-how-has-covid-19-impacted-the-agrifood-sector-in-2020>



According to the survey, these changes will have a sustainable effect with nearly a third of surveyed saying that it will be more important to have time to cook home-made meals (27%) and to continue eating more varied foods (30%) after the pandemic.

Although, affordability will remain a major issue for many people, 32% said that even if access to food at low prices will be more important, it should not come at the cost of health and good nutrition. Almost half of consumers (49%) said being in good health will be more important to them as a result of COVID-19 and over a third (35%) said that buying locally produced food has become more important to them during the COVID-19 pandemic. Almost nine in ten (87%) reported that they were very likely to continue doing so in the future.<sup>7</sup>



**Figure 3: Changing consumer behavior due to Covid-19 pandemic**

Source: EIT

We can understand the Covid-19 pandemic as accelerator for various action points that have been addressed already before 2020 such as decentralized manufacturing or avoidance of food waste. Some examples are highlighted in the EIT report “Crisis vs opportunity: how has COVID-19 impacted the agrifood sector in 2020?” such as the collaborative project Robin Food in Belgium that brought together many organizations across the food system coming together to make use of surplus vegetables during the pandemic to create healthy soups for vulnerable people or the example of Brewdog which started producing hand sanitizer alongside its beverages.

One can conclude that even if uncertainty may still exist within the agrifood sector, the Covid-19 pandemic can be seen as a change to fulfill the points outlined by the European “From farm to fork” strategy. In a recent episode of the Food Fight podcast, Sahi, CEO and co-founder of EIT Food RisingFoodStar SwissDeCode noted that “it’s a lot easier to have a conversation about food safety today than it was in the past,” and Professor Klaus Grunert, Head of Section of the Department of Management at Aarhus University added that “from the perspective of the green transition, there is a chance for the agrifood sector to actually become a better place.”<sup>8</sup>

<sup>7</sup> <https://www.eitfood.eu/news/post/eit-food-report-reveals-lasting-impact-of-covid-19-pandemic-on-european-food-behaviours>

<sup>8</sup> EIT Food: [The Food Fight podcast: The impact of covid-19 on consumer food habits and the agrifood sector](#)



## Literature

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