

Fooduristic²¹



**Solutions that bring us closer
to the future of food**

Fooduristic²¹
KMZERO
CREATING THE FUTURE OF FOOD



About the cover

NeoFruits, a project developed by Israeli designer Meydan Levy, awakens our imagination to discover new possibilities for the food of the future. The designer develops artificially designed fruits and, in this way, reimagines the experience of eating in the future.

Fruits as we know them provoke emotions, are packaged masterfully, and engage consumers. An individual can know what vitamins and minerals a fruit contains as well as assess its ripeness from color alone. **A full pragmatic, visual, sensual, and nutritional experience is imparted when we eat fruit.** Much of this experience is lost in nutritional supplements today - the connection between form and content is severed since supplements are usually sold in the form of powders, capsules or tablets. NeoFruits proposes to re-establish this connection, offering food of the future that considers form and content as fundamental factors in the eating experience.

Today, through 4D printing we are able to create new types of food. NeoFruits uses 4D printing technology to create inspiring food products using cellulose (an organic material).

With this technology we can think about the food of the future in an innovative and different way compared with current production. This new vision entails building a society that considers **health and nutrition** as a complete experience, while considering environmental consequences.

NeoFruits' design is not intended to be a criticism of the current food ecosystem, but rather a provocation resulting from curiosity and reflection, aiming to be a **bridge between industry and human nature**.

What will you find at Fooduristic?

- **A compilation of solutions to the challenges of the food system, with health and the environment as the basis for all innovations, and a mapping of investments in startups in the different sub-sectors.**
- **An analysis of developments in alternative proteins: plant-based, cellular, or fermented.**
- **Precision agriculture and nutrition as an area of opportunity for the agri-food industry.**
- **Digital acceleration trends in retail and food service.**
- **Technologies aimed at reducing the environmental impact of food production: water footprint solutions in agriculture and, circular waste management systems, packaging innovations, and more.**
- **Digital and data-based tools for more efficient production and distribution .**
- **A summary of highlights from the Ftalks Food Summit 2020.**

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CHALLENGES AND OPPORTUNITIES
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01

Challenges and opportunities for the food system

How to feed a continuously growing world population, how to facilitate access to healthy food and how to minimize the environmental impact of its activity, are some of the most important challenges facing the food system today, which also represent spaces of opportunity that can be addressed through innovation. The aim is to move towards a healthier, more sustainable and more accesible food system.

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What is clear is that we cannot understand the food sector without considering its impact on the planet and people's health. Therefore, a holistic approach is needed, that consider all actors and a commitment that brings us closer, through concrete actions, to the goals set by the UN's Sustainable Development Goals (SDGs), many of which either directly or indirectly impact the food system.

"Inequality in access to food, climate change and people's health are some of the most pressing challenges in the food system. We must take responsibility from the role we each play, understanding that the only certainty we have is that the future is made up of actions of the present. Let us cooperate with the people who are transforming the sector with positive impact, taking advantage of the momentum in food innovation".

Beatriz Jacoste,
Director of KM ZERO Food Innovation Hub.



Fooduristic emerged in 2019 as a space for reflection on some of the best food innovations taking place throughout different parts of the world and on how people, projects or companies are developing solutions to the present and future challenges of the food. At KM ZERO we are committed to our mission: inspiring transformation by connecting the actors who are leading innovation, to achieve a more sustainable, healthy, and accessible future through food.

2020 has been a complex year in which changes that were anticipated to take place years from now have now been accelerated to the present. This speed of change has taught us that the future is closer than we imagine and that the way we are prepared to create it, or at least face it and adapt to it, will depend on our decisions and actions today. And it is with this willingness to change and reinvent that KM ZERO has dedicated itself to.

In our latest report, Fooduristic COVID-19 Special Edition, we analyzed the impact of the coronavirus crisis on the food value chain. The months that have proceeded the pandemic have shown how essential the food sector is and how we are living in a unique era, in which now more than ever, conversations around food and its relationship with the environment and health are ubiquitous. We discuss food from various lens: sustainable food, healthy food and even food as medicine. These are just some of the topics that are the basis of our reflections in the Fooduristic 2021 report.

The coronavirus crisis has revealed our vulnerability and the importance of restoring the balance between human activity and nature. In the words of Frans Timmermans, Executive Vice President of the European Commission, the Biodiversity Strategy and the “From Farm to Fork” Strategy, central elements of the Green Deal, “aim at a new and improved balance between nature, food systems and biodiversity to protect the health and well-being of our citizens and, at the same time, increase the competitiveness and resilience of the EU”.



One in five deaths in the EU can be attributed to an unhealthy diet. The European Union says that healthy, more plant-based diets reduce the risk of life-threatening diseases on the one hand and on the other, the food system’s impact on the environment.



Among other actions, the Commission proposes mandatory front-of-pack nutrition labelling and developing frameworks for sustainable food labelling covering nutritional, climatic, environmental and social aspects of food products.

In addition, the Commission proposes that we aim to achieve a 50% reduction in food waste per capita in the retail trade and among consumers by 2030. The Commission will develop legally binding targets to reduce food waste across the EU by 2023. Therefore, we are currently seeing a surge of projects developing solutions in the circular economy, new technology, and changing consumer habits to address this formidable challenge.

And of course, these objectives will be carried out largely through research and innovation, for which 10,000 million euros are earmarked under the Horizon Europe Program. Many of the investments will go to projects highlighted in the Fooduristic 2021 report.

“The food industry has a great opportunity to lead the transition to a more sustainable system, which also influences the reputation of our companies and products, creating more value for everyone, attracting talent and investment and new business opportunities with new models based on, for example, the circular economy”.

Raúl Martín,
CEO of KM ZERO Food Innovation Hub.

Key areas of discussion related to the microbiome, ocean food and urban food systems, as well as increasing the availability and supply of alternative proteins, such as plant, microbial, marine and insect-based proteins, and meat substitutes, as outlined in the Green Deal release.

At KM ZERO we want to contribute to raising awareness about the vital role that future food systems will play in the global challenges of hunger, poverty, lack of biodiversity and climate change. We have begun to act, but we are doing so in silos, without a common perspective and without considering many systemic implications across different areas. Our desire is to increase our capacity to transform and generate impact. And we can only do that together. We invite you to join; the table is served and waiting for us.



The future of food is to adapt the food system to targets of social, economic and environmental sustainability.

“Production, distribution and consumption of food have undergone profound changes in recent decades that increasingly threaten the sustainability, equity and security of food in the future. This widens our gap in achieving SGD 2: zero hunger, a goal whose targets have been impacted by the economic slowdown and the disruption of food value chains brought on by COVID-19.

The agrifood industry’s impact on the environment is another challenge that must be addressed with greater urgency, since food production and consumption as a whole is responsible for the emission of one-third of the greenhouse gases that cause climate change and jeopardize the achievement of SGD 13.

That is why the United Nations Secretary-General, António Guterres, has announced a Summit on Food Systems for 2021, which will aim to raise global awareness and initiate global commitments and actions to transform food systems, both to eradicate hunger and to protect the planet.

The main message is that, in the Decade for Action on SDGs, increased agricultural productivity must be achieved without damaging the environment, depleting natural resources and with greater emphasis on mitigating climate change. This poses a huge challenge for the business sector, which must ur-

gently initiate food system transformation in line with the 2030 Agenda. This is a challenge that Red Española por el Pacto Mundial is tackling through our Agrifood Sector Group, which has shown itself to be a pioneer in adapting its business to sustainability criteria through various measures. Measures that include responsible management of resources, zero waste and the reduction of emissions. This is just one example of how the business sector is adapting to these challenges, which will require the efforts of all actors, including government and civil society.

It is important to remember that food is a fundamental right, and we must all work in partnership to ensure it”.



Cristina Sánchez,
Executive Director of Red
Española del Pacto Mundial

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“I think that many readers will agree that, for years now, world-altering events have been occurring at a pace that I would describe as dizzying: the fall of the Berlin Wall, or with the arrival of the new century, the attack on the Twin Towers, the collapse of the once all-powerful Lehman Brothers bank, amongst others.

Our world has experienced more transformational global events than entire generations. Everything accelerates, everything rushes, everything emerges, bursts, transgresses. And almost nothing flows. This absurd compression of time is clear evidence of a series of errors that are making the planet sick. The world is sick, both its systems and its structures. Sickness from greed and over accumulation of resources over centuries brings us closer to the precipice.

To feed human beings is the noblest of ambitions. It is a collective challenge that sets dignity and health at all levels. Energy for people, for all people, is the noblest of all energies. If there is a real historical, transcendental challenge, beyond the primitive struggles for power and influence, it is to reconsider the food systems. Make it the highest obligatory mission for political leaders, in local and global responsibilities, to set a global model that allows all people to feed themselves adequately. There are sufficient resources, technology and wisdom to make that mission successful.

We've learned enough that the processes linked to respect for others and for the earth are going to start flowing little by little. We are already living a new form of common consciousness that is reaching every corner of every city: we are responsible for our present, but above all for our future. A global and participatory challenge has begun through food. We cannot lose this opportunity”.

Vicente Domingo,
Director of World Sustainable Urban Food Centre of València (CEMAS).



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“The UN SDGs are a gift. They provide a common language, a common compass, a common reference point. Equipped with the foundation of leaders across sectors united around these goals, the tricky part is turning them into concrete action steps. It’s like a team soccer huddle that, once we all clap our hands and break to run off to play our positions, we find ourselves pausing to say: “Wait, who does what in this game?” I personally find inspiration and clarity from collaborations who tackle this very challenge presented by the SDGs—like the Chefs Manifesto led by SDG2 Advocacy Hub and the FReSH program led by World Business Council for Sustainable Development.

Only through international consortia, public-private partnerships, and multi-stakeholder alliances can we keep communication channels open, share insights and strategies, navigate challenges, and scale successful models as we all work toward the north star the SDGs gave us. That said, when it comes to the role of food—which is one of the most powerful and yet most overlooked tools for climate action- communication is one of the biggest barriers to greater translation of the SDGs into action.

The science is clear on what a climate-smart diet looks like, and one that’s best for human health as well. So why isn’t the whole world eating this way? Why isn’t climate-friendly eating the norm? In part, it’s because current climate narratives are leaving huge numbers of people out of the movement, through language and messaging that’s often framed in the negative, that can be polarizing and exclusionary, and that’s not meeting folks’ most fundamental human needs of control, community, and purpose.

It’s for these reasons that I’m proud and energized to be the Director of Strategy for the Food for Climate League, a new nonprofit that is researching,

testing, and disseminating best practices for talking about food and climate. As part of this work, we’re grateful to be working with so many leaders in the restaurant and food-service industry, because culinary professionals have a huge role to play in making climate-smart eating the norm—by making it delicious.

Once we nail the messaging, we’ll be off to the races. By shifting the story, by creating new narratives, we can—at long last— democratize sustainable eating. Only then can we finally live out the vision for the many food-related indicators listed in the SDGs”.

Sophie Egan,
Author “How to be a conscious eater” &
Founder of Full Table Solutions.



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02

Driving impact investing

2020 Has been very positive for startups in the food sector in terms of investment. Many of the investments have responded to rising challenges motivated by the pandemic. Investments in agtech reached \$2.2 billion in just six months in 2020 compared to \$2.7 billion for the entire 2019. Likewise, investments in foodtech reached \$4.8 billion by mid-2020, while investments at year end by 2019, were \$7 billion.

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Investment in foodtech innovations is closely correlated with the pandemic social effects. Yet, many of these changes are here to stay.



An example of this is the boost in investments seen in online food delivery platforms, which, albeit experienced significant and gradual growth pre-pandemic, have now in the months following closure and restrictions in the hospitality sector, as the only viable solution to keep businesses alive, thus accelerating investment and development of these platforms.

According to the report by Eatable Adventures on the state of foodtech in Spain, the country has approximately 400 startups within the foodtech sector. Approximately 40% of Spanish startups in the sector are focused on food production and transformation. Meanwhile, up to 60% are focused on products made with new ingredients and different sources of production.

Globally, \$19.8 Billion of investments were made in 2019 according to the AgFunder

report, pointing out the increase in product startups and the drop in investment in delivery companies. In Spain, one of the most outstanding startups is Glovo, which leads in terms of investment amount.

Foodtech Unicorns

In 2013, Tech Crunch published the article: “Welcome to the Unicorn Club”, popularizing the concept of unicorn startups, startups valued at more than one billion dollars. The term unicorn was coined by venture capitalist Aileen Lee in a study that reflected that only 0.1% of invested startups were valued at more than one billion dollars. Hence, the term “Unicorn” indicates a utopian, rare, or unique event. Note: all data regarding investments received by startups has been compiled from Crunchbase.



Promoting impact investment in the sustainable food sector in Europe.

“Impact investment in the food sector follows an upward path. The Covid-19 crisis has only accentuated the importance high-quality healthy food and the need to build less linear and more autonomous value chains. This crisis has also brought more complexity to already important challenges such as single-use packaging or the survival of physical business models. In general, investment in sustainable food is performing better than other sectors in the Venture Capital (VC) and Private Equity (PE) portfolios in these pandemic times.

The underlying trends are favorable for the sector and institutional investors with high investment capacity are being increasingly present. However, how the sector is being financed and why many entrepreneurs still have great difficulty in finding private and institutional financing is an important question. The answer is not simple and diagnoses vary greatly depending on the angle and geography from which it is analyzed.

From Quadia’s experience as one of the pioneers in impact investment along the sustainable food value chain in Europe [1], we can try to provide several reasons for this problem: on the one hand, the sector in Europe is not very homogeneous in its development and highly atomized in its implementation. For example, the pace of adoption of organic and local food by consumers is not the same in Spain as in France, where the sector has been making progress for several years.

On the other hand, there are only a few startups companies that operate simultaneously in multiple European countries. We see very similar business models in countries such as France, Germany or the Netherlands, who often don’t know about each other’s existence. Companies in technological fields such as urban agriculture, sustainable aquaculture or alternative proteins, invest resources to develop practically identical technologies and models, each of which is highly capital-intensive. Likewise, innovative companies in more traditional areas such as the reduction and management of food waste do not take sufficient advantage of the existence of models that are already functional and proven in other European countries.

A similar phenomenon occurs from an investment point of view. So far, many of the impact VC and private equity investors in Europe have national approaches, largely because their respective Limited Partners order them to invest in their home

countries. Therefore, what should intuitively be very positive to energize and grow local sectors, sometimes becomes a double-edged sword. Depending on the sector development that each country has, investors might find difficult to find suitable opportunities. The reasons could be that these companies do not exist yet or because these companies do not have the capacity to absorb considerable investment tickets.

Therefore, both investors and companies therefore have a responsibility to create links between the ecosystems of the sustainable food sector in Europe. These links can be of different nature: technological, business development, supply and distribution chain or even financial. The growth capacity of the sector is such that cooperation can generally be advantageous without being detrimental to the preservation of competitive advantage. The role of actors such as technology centers, foundations, public financing institutions and European entities under the guidelines of the new Green Deal working in the field of food will also be key in the coming years. The real bottom-up growth of the sustainable food sector will largely be through ‘Europeanization’, scaling the best existing solutions, but preserving the local implementation of them. 1] Since 2014, Quadia has financed, through equity and debt, more than 30 companies in the sustainable food sector in Europe, including international success stories such as La Ruche qui dit Oui, Ynsect, Infarm, Loop and Olio”.



Josep Segarra,
Impact Investment Manager at Quadia



Alternative Proteins

A sector characterized by its mega rounds

Impossible Foods

This startup is leading the mega investment rounds in the field of alternative proteins. With its “Plant Burger” it aims to offer a product that replicates the organoleptic properties of meat, with a much smaller carbon footprint.

INVESTMENT RECEIVED: **EUR 1.2 billion**

Motif FoodWorks

This ginkgo bioworks spin-off is rolling out the commercial-scale production of its first product: a vegetable-based flavoring to improve the taste of beef substitutes.

INVESTMENT RECEIVED: **EUR 100 million**

Puris

After a EUR 75 million investment from Cargill, the ingredients company plans to open its second factory next year and is increasing its offerings with lupine flour and pea syrup.

INVESTMENT RECEIVED: **EUR 115 million**

The LiveKindly Co.

The LIVEKINDLY Collective is a family of startups that include: The Fry Family Food Co., LikeMeat, and LIVEKINDLY Media. All are committed to transforming the food system through plant-based solutions. They have created synergies along the entire food chain (with seed producers, industry, logistics, etc.) in order to transform meat production plants into plant-based industries.

INVESTMENT RECEIVED: **EUR 282 million**

Clara Foods

Clara Foods is developing a new line of ingredients, Clara Whites, to replace egg white in more applications than any other egg white substitutes. They use a patented protein functionality matrix to provide better volume, foam, texture and tensile strength.

INVESTMENT RECEIVED: **EUR 39.4 million**

Algama

This foodtech company develops innovative products based on microalgae, highlighting the potential that this ingredient has for health and sustainability. Through their advanced technology they manage to produce solutions for the sector, extracting the properties of algae to the maximum.

INVESTMENT RECEIVED: **EUR 5.3 million**

Food waste

Apeel Sciences

This technology extends the life of food through a polymer that creates a double skin on fruits to reinforce their internal layer and make them breathe less and therefore lose less water making them take longer to oxidize.

INVESTMENT RECEIVED: **EUR 326 million**

Notpla

Notpla has reinvented packaging by making it disappear. Thanks to an algae-based composition, they have created a totally biodegradable membrane that contains liquids and sauces.

INVESTMENT RECEIVED: **EUR 6 million**

Oddbox

Rescues “ugly” fruits and vegetables through its home box subscription service with these products.

INVESTMENT RECEIVED: **EUR 3.9 million**

OLIO

This app is changing food transactions, making it possible for consumers to exchange products to avoid food waste.

INVESTMENT RECEIVED: **EUR 10.1 million**

TIPA

Has developed a wide portfolio of products and applications based on innovative technology and supported by strong IP. They operate on a global scale with compostable polymer technology, applicable worldwide.

INVESTMENT RECEIVED: **EUR 38.7 million**





Agtech

A sector that has experienced a growth of 250% in the last five years.

Aerofarms

This hydroponic cultivation company aims to democratize access to healthy and fresh food.

INVESTMENT RECEIVED: **EUR 200 million**

Agricool

Agricool has made it possible to shorten the distance between farms and urban centers with an innovative solution: containers with vertical crops that act as mini-farms in cities.

INVESTMENT RECEIVED: **EUR 38.9 million**

Agrivi

A software that provides real-time information to farmers, making possible to optimize the control over weather, pests or diseases for plant protection.

INVESTMENT RECEIVED: **EUR 1.4 million**

Sencrop

The French startup has developed multiple sensors that allow farmers to monitor their crops through their app.

INVESTMENT RECEIVED: **EUR 12 million**

Agrilution

This startup has developed Plantcube: an appliance that allows consumers to grow vegetables in their own kitchen.

INVESTMENT RECEIVED: **EUR 4.5 million**

Naïo Technologies

Selection of environmentally-friendly harvesting robots that help to increase field productivity. Different models are available for the collection of vegetables and vineyards.

INVESTMENT RECEIVED: **EUR 19.5 million**

Food Service & Delivery

DoorDash

The food delivery service created by two students from Stanford (California) in 2013, has tops investments in this sub-sector.

INVESTMENT RECEIVED: **EUR 2.090 million**

Instacart

Allows users to shop online at local supermarkets aided by personal shoppers that assist on the order and provide same-day delivery.

INVESTMENT RECEIVED: **EUR 2.006 million**

Deliveroo

Deliveroo has been a catalyst for innovation in a mature sector such as the restaurant business. Many local restaurants have optimized their processes and incorporated technology, developed new more sustainable packaging, new ingredients that travel better, created new brands, expanded their businesses, and had access to new customers, new moments and new spaces for consumption thanks to Deliveroo.

INVESTMENT RECEIVED: **EUR 1.254 million**

Rappi

Recognized as the Latin America SuperApp based on its exponential growth, this delivery company founded in Bogota (Colombia), is currently present in Mexico, Costa Rica, Colombia, Peru, Ecuador, Chile, Argentina, Uruguay and Brazil. They support restaurants and supermarkets to bring them closer to the homes of consumers.

INVESTMENT RECEIVED: **EUR 1.421 million**

Glovo

One of the Spanish Unicorns, based in Barcelona and founded by Oscar Pierre and Sacha Michaud is present in 26 countries and 300 cities. This startup is surpassing a valuation of 1 billion.

INVESTMENT RECEIVED: **EUR 429 million**



Blue Horizon Ventures

Blue Horizon Ventures, a European venture capital fund focused on food-tech, has the mission of ‘Transforming the world by supporting world-class entrepreneurs’. Its portfolio includes companies in alternative proteins, laboratory grown foods and synthetic biology solutions. Some of its notable portfolio companies are Cubiq Foods, Mosa Meat, and The LIVEKINDLY Co.



Quadia

With a vision to support the regenerative and circular economy, the fund has invested EUR 200 million worldwide since 2010. Its portfolio is diversified and includes companies such as Farmidable, Infarm, Loop, La Ruche qui dit Oui, OLIO, Winnow, Ynsect...



Big Idea Ventures

This US and Singapore based venture capital fund has created The New Protein Fund with over \$50 million to invest in alternative protein projects: plant-based and laboratory. Among their investments include very curious ones like Novel Farms which produces lab-grown Iberian ham.



PeakBridge

The Israeli venture capital fund invests in high-impact technology for the agri-food sector. They have invested in projects such as Tastewise, an artificial intelligence company that provides strategic data for the food industry and the hotels, restaurants, and café (HORECA) sector.



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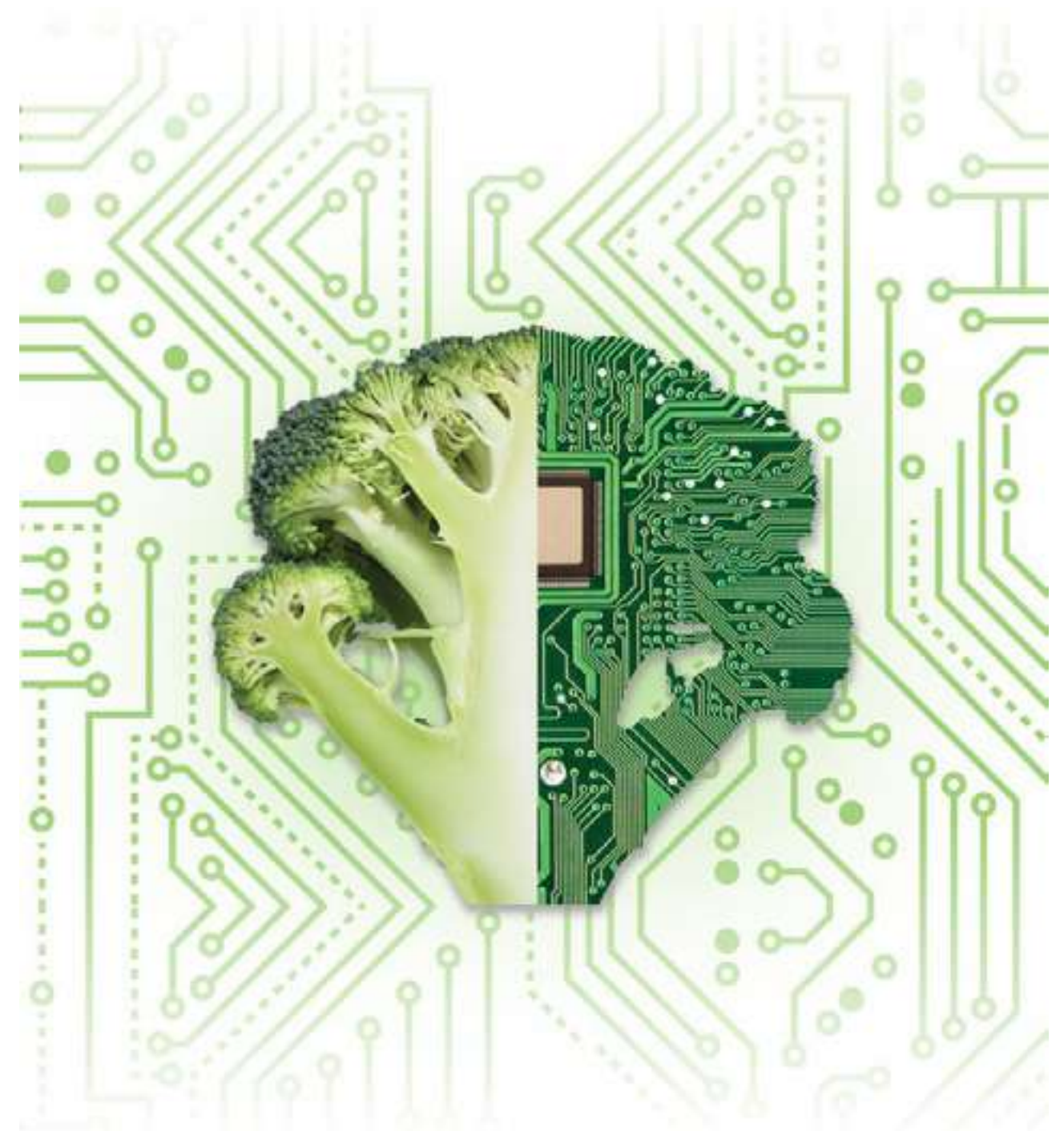
EIT Food

“Food will be adapted to the changes occurring in society, there’s no doubt about that. Not only in the way we consume, but also in the way we produce food. As an example, in the next 30 years, one tenth of agricultural land will be lost due to erosion, salinity and climate change, and we will have to adapt our current production to be able to feed the entire population in the future. In addition, COVID-19 has also challenged the agrifood sector to adapt certain parts of the supply chain in a very short time. The great success is a proof of its strength and resilience.

This motivates those who support the sector to take the responsibility of educating the new generations and reinforcing consumer confidence. The growing relationship between health and food, sustainability, and transparency are fundamental aspects to continue moving forward. EIT Food has invested EUR 5 million this year in supporting promising food startups that have been particularly affected by COVID-19 and more than EUR 6 million in innovative high-impact projects to meet the immediate needs of the sector.

At EIT Food we are committed to the new generations’ relationship with healthy and sustainable food. That is why education, together with entrepreneurship, innovation and communication, are our key pillars.

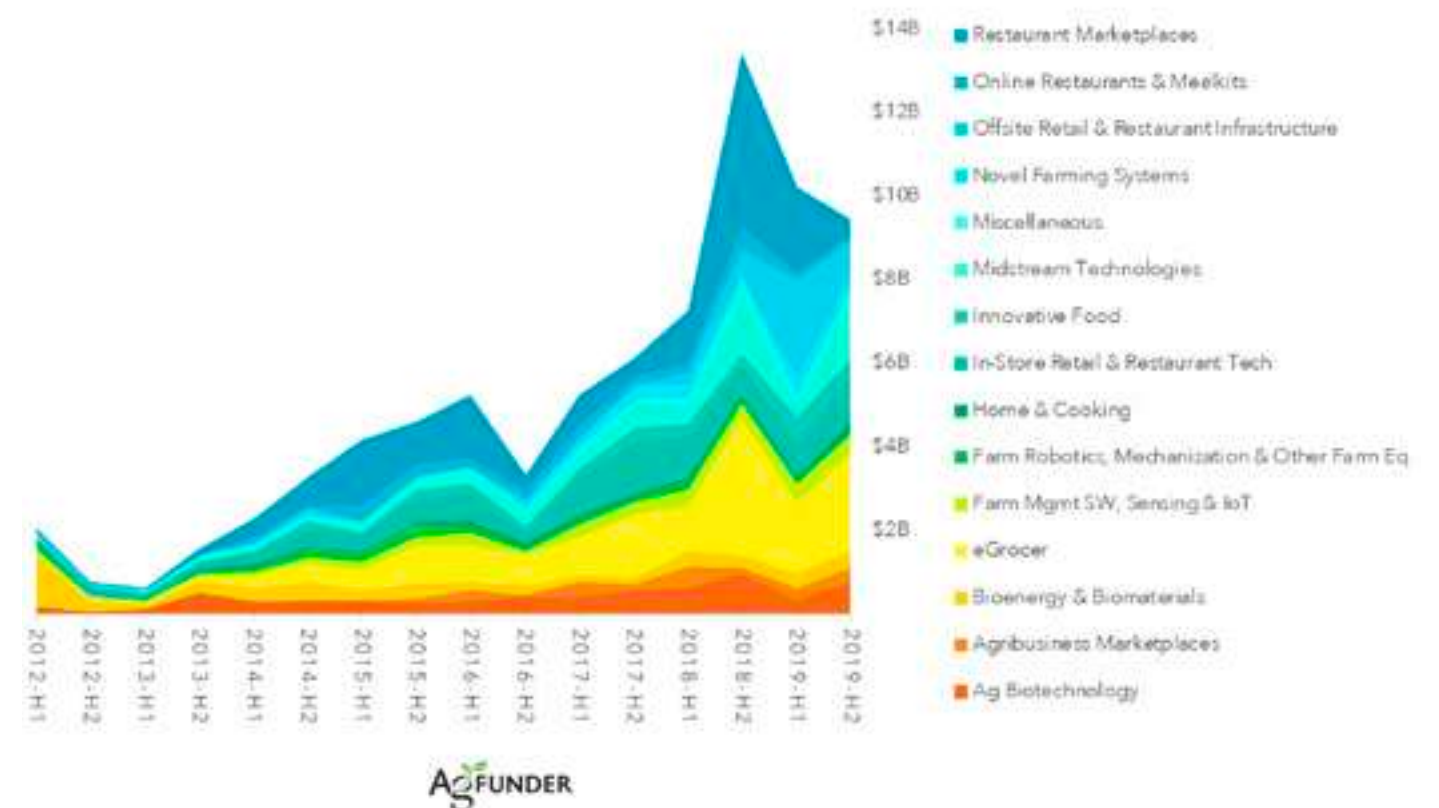
There is much work left to be done. There is a need to create intelligent food value chains in Europe, and we must develop both new infrastructure and the capacity to stimulate and support innovation and entrepreneurship in our sector. There is a lot of talent, and also the willingness to learn”.





The sub-sectors that have received the most investment are alternative proteins, urban crops, robotic delivery, and cloud kitchens or virtual restaurants. (AgFunder Agri-FoodTech Investing Report 2019).

Investment by Category 2012-2019



It will also be interesting to observe how investment is distributed globally, since continents such as Latin America and Africa are accelerating developments in this aspect. In the case of Latin America, agrifoodtech deals were closed for a value of 1,400 million dollars, with multi-million-dollar investments such as that of Rappi or NotCo, which represents a growth of 40% from 2018.

What is clear is that investors are determined to support projects that are disruptive and have the potential to survive the crisis. However, they will be demanding when examining growth and scalability, so in the next rounds of investment entrepreneurs will have to demonstrate that they have retained customers and expanded margins.

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“Investment in the first half of 2020 related to innovation in the food industry - AgTech, Food Tech, Agrifood - has risen between \$7 billion and \$8 billion (Sources: Finisterre Ventures and AgFunder)."

That is, it continues to rise, despite the crisis, or perhaps thanks to it in some respects. And current forecasts predict a year that will be even better than the previous one.

The truth is that the areas of greatest growth have been the result of Covid-19. E-grocery/Delivery, a quasi-essential service during lockdown; midstream technology, which supports areas such as logistics, the supply chain and traceability; and of course, new foods, including alternative protein segments such as plant-based or cell based, continue in their exponential growth. With \$1.1 billion invested the first six months, the sector had already exceeded the total investment anticipated for 2020.

With or without tailwinds, many of these segments face challenges: producing return on investment, growing to profitability, retaining customers and margins... and increasingly, achieving real impact.

Impact, how so?

On one hand, impact defined as an investment type oriented to generating value by resolving real and current problems or needs in the industry. Value that translates into improvements in the profitability or scalability of companies, or even in the generation of new business models. The Agrifood Tech Transfer fund is an example of a specialized VC oriented to solving specific industry demands, connecting them with technology offerings. PILOT (formerly TERRA) or Porcinnova, as an incubator or accelerator, also walks this same path. This is in addition to food companies that are creating similar tools to address specific challenges.

But a broader concept of impact encompasses society and the environment. That is, integrating as an objective, alongside return on investment, generation of a positive and measurable impact both socially and environmentally. The agrifood sector is a particularly favorable sector for this 'ESG approach' (Environment, Social, Governance) to investments as can be seen from numerous firms that incorporate this approach into their DNA: Lever VC, New Crop Capital, Eat Beyond Global...

Not only are the two approaches non-exclusive, but they are also two sides of the same coin. Analyses by firms such as McKinsey & Company debunk the myth that this type of "social" investment offers poor and slow returns. A report from Harvard Business School states that companies that bet on an ESG strategy have 4.8% higher returns than those that do not. Another report by Deutsche Bank also concludes that companies with strong ESG components have above-market returns in both the medium and long term.

In fact, funds are also noticing growing interest among their portfolio companies in investing in sustainability. Perhaps they are paying attention to consumer desires, mainly millennials and later generations, who are more sensitive to these issues. We see though that the crisis is straining the ability to meet these demands, and that when the pocketbook is tightened, it makes it that much more difficult to materialize these intentions.

In any case, impact investment, with purpose, or the ESG approach, must be grounded in concrete quantitative and qualitative objectives, and practiced consistently and coherently. Systematically combining ESG factors with traditional financial indicators aims to bring about a more nuanced analysis of the merits of long-term investment. And it is important to seek an alignment between investor and investing spirit. That is the mission of both parties involved. Otherwise, we will see cases like Oatly-Blackstone. But that's another matter.

Beatriz Romanos,
Founder of The TechFood





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03

The future of alternative proteins and fats

2020 has been marked by major changes in the food industry. One of the key priorities is to change the model of food production. Especially the production of proteins, since, as the FAO anticipates, in 30 years we will have to double our current protein production.

& ALTERNATIVE FATS
& ALTERNATIVE FATS
& ALTERNATIVE FATS
& ALTERNATIVE FATS

Consumers are asking producers to change their production models, to develop new products at convenient prices, at the same time upholding quality. The plant-based movement, led by vegan groups, has sensitized much of the population, and a much larger group of flexitarians is driving the change.

The next ten years will be very different from the last decade. While meat protein consumption will continue to increase, the growth rate will slow to 50% (around 1-1.5% per year), with growth localized to specific sectors. This will be an era characterized by major macroeconomic, demographic and nutritional changes, which will present opportunities for industry players.

Plant proteins are competing for a growing share of protein consumption in some markets, driven especially by

“Some food producers believe that the plant-based sector will soon represent up to 20 or 25% of their sales. These new products have nothing to do with the ones we have been consuming traditionally - they are based on new ingredients and processes, textures and flavours, which require a specialised R&D department with the resources to keep up to date. Alternative proteins and fats will have a very high demand because we are talking about a very important volume on a global scale”.

Andrés Montefeltro,
CEO Cubiq Foods.

consumer concerns about the environmental impact of livestock production. Adjacent protein markets are expected to generate new opportunities. Global consumption of dairy, for example, is projected to grow at a rate of 1.5% per year until 2025, driven by a 3% annual increase in consumption in sub-Saharan Africa.



European food companies have increased launches of new products with vegetable proteins. In particular, such launches have gone from 8% in the period 2013-2014 to 11% in the period 2017-2018. This trend is reflected in different product categories: snacks, processed meat, fish or eggs and dairy products.



“The outbreak of the Covid-19 pandemic has resulted in a notable increase in the consumption of meat and meat products. Above all, unpredictability in demand that has been spreading over the last few months, will surely continue in the future”.

David Barreiro,
Keynote Speaker Eurocarne.

BEST PRACTICES

Garden Gourmet

They recently launched the “Sensational Burger” a product made of soybean and wheat protein. Each burger provides up to 16 grams of protein and, in addition, does not contain cholesterol, has less saturated fat than a meat burger and is a good source of dietary fiber.

Heura

The company is reinventing the way people eat protein by creating a soy-based option that stands out for its similarity to real meat in both taste and appearance. It is not only the experience that imitates real meat, but also the nutritional value. Their products are low in saturated fat, have no cholesterol and have twice the protein of an egg.

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“This transition towards a more sustainable, healthy and inclusive way of eating involves ensuring the intake of quality proteins based on vegetable raw materials. The estimated global population growth of 9.6 billion people by 2050 is creating an urgent need to develop sustainable solutions for the proper supply of high-quality protein.

On the one hand, we are consuming animal proteins beyond our means because of the rate at which the world population is growing. Nature cannot give us “more credit”. This overindulgence promises to be unsustainable.

On the other hand, proteins are indispensable for health. Human beings must ingest this nutrient daily. For this reason, the EFSA, (European Food Safety Authority), recommends that adults’ intake at least 0.83 g of protein per kg of weight per day. They also recommend the inclusion of essential amino acids into our daily diet, which we cannot manufacture, since these proteins are necessary for the construction and repair of body structures, tissues, hormones, enzymes, and antibodies.

In comparison with proteins of animal origin, plant-based proteins cover nutritional requirements without compromising the environmental sustainability and by reducing the carbon footprint.

In this edition, we will see how the European project, **Protein2food**, is aiming to develop high quality foods from cereals, seeds and legumes rich in proteins of high biological value. We will also see how the **ProALT** project conducts research on macroalgae, water lentils (lemna) or hemp seeds, and other more incipient ones such as cell cultures. These excellent sources of vegetable protein are developed by means of optimized and sustainable production and processing methods and are nutritious and respectful of the environment.

Food companies have a social and health responsibility. Providing consumers with healthy options based on foods rich in proteins like hemp, peas, carob, amaranth, buckwheat, seaweed or quinoa. However, replacing animal protein foods with these more sustainable options is not easy due to differences in digestibility, taste and aroma. Food education and habit and taste change are



needed to meet this challenge, as well as investment in attractive, tasty and sustainable plant options.

The inclusion of vegetable proteins in our daily diet allows us to cover nutritional needs with less impact on the environment. The future of protein must consider human health and that of the planet, more efficient and ecological agricultural practices and greater biodiversity”.

Biogran, Grupo Ecotone.



Insects are a source of protein in human and animal consumption. They are a very sustainable and nutritious raw material, especially because of their high contribution in high quality proteins.

Microbial fermentation is another technological development we are seeing with great potential for global impact. Fermentation technology aims to transform the protein market by increasing the food safety and plant-based diets around the world.



BEST PRACTICES

BioflyTech

A technology-based company that hopes to play a key role in this new productive sector. With the development of its own know-how, applied to the industrial production of black soldier fly larvae (*Hermetia illucens*), the company intends to contribute significantly to the commercialization of proteins and fats for animal feeding thus indirectly impacting human nutrition.

Ainia

Ainia is part of the PROALTI project, in which alternative sources of proteins from different origins (lemna, insects and Single Cell Protein) are researched, to determine which new ingredients can be developed to improve the technological, functional and nutritional properties of foods.

Trillions

The cricket flour-based sports supplement company will add new products to its portfolio, such as chocolate, coconut and vanilla flavored protein powders made from a mixture of insect protein and vegan protein. Unlike other proteins, this one has better tolerance in the population since it does not contain lactose or whey.



BEST PRACTICES

MeliBio

This startup is using microbial fermentation to produce bee-free honey. The first completely vegan honey in the world.

Napiferyn

The company extracts proteins from the residues created by rapeseed oil production. This sustainable alternative to animal protein has the same nutritional value as soya.

Bond Pet Foods

They are the first company in the world to produce cultured chicken meat for pets. Its portfolio also includes protein-rich snacks made from fermentation.

TurtleTree Labs

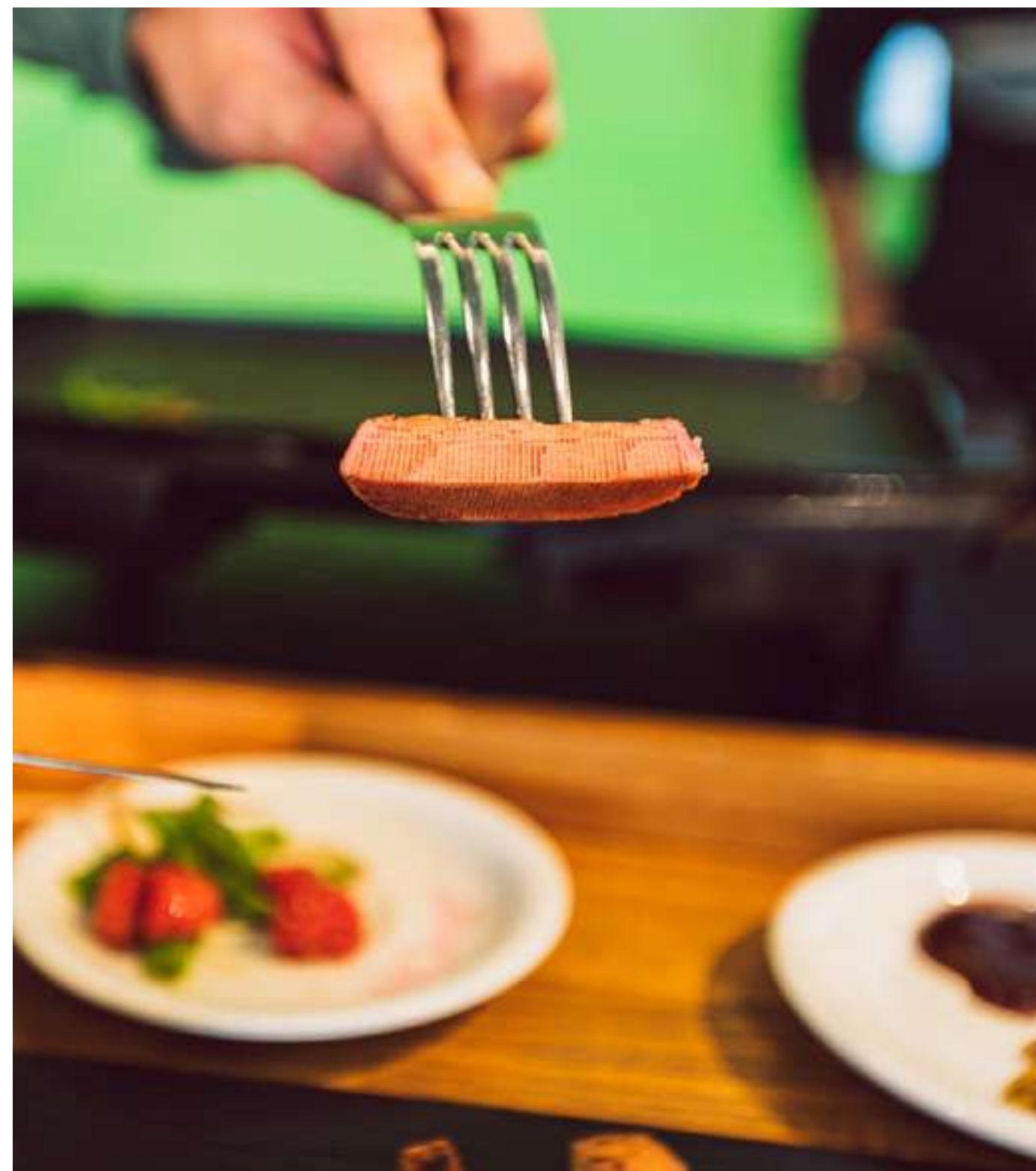
They are the first company in the world to produce cow's milk and human breast milk from cultured cells.

Mission Barns

They have created cell-cultured bacon; their products are currently available in restaurants in San Francisco where consumers can taste them with a reservation.

Arla

Has launched their first vegetable milk: Jörd. The new product is already sold in Denmark and, as of September 21st, in the British supermarket chain Sainsbury's. The brand wants to position its vegetable drink as a complement to milk, rather than a substitute.



"Our technology works with natural ingredients to produce 'healthier meat' with low fat and high protein content, without the health problems associated with meat consumption".

Giuseppe Scionti,
CEO & Founder Novameat.



Dacsa Group

“Dacsa Group through its food solutions company, Molendum Ingredients, located in Coreses (Zamora), has made the first investment in a plant for texturizing Dry and Wet Vegetable Protein. The plant has been operating since 2020.

The plant has an extrusion line and another one that maintains humidity and refrigeration. All this with excellent quality raw materials and the production experience of Molendum Ingredients. In line with one of the biggest trends on the rise - ‘Plant Based’.

At a national level, the greatest presence of vegetable wet proteins is in the refrigerated aisle where can find frozen hamburgers, sausages, and batter, among others. Everything is always vegetable.

Dacsa Group is an industrial group dedicated to the development of Food Ingredients with three business areas: Rice Milling, Corn Milling and Food Solutions.

Dacsa Group is the leading company in Europe in corn milling and is a recognized rice producer in Spain and Portugal with well-known rice brands. Dacsa Group operates nine production plants in six different locations in Europe and has more than 500 employees”.

Dacsa Group



The sea also plays a very important role in obtaining new sources of protein. Companies like Seamore are marketing products to make seaweed more accessible such as Seaweed chips, tortillas and even bread with a high percentage of seaweed. The Algae Factory is creating foods like fortified chocolate that provide very high levels of sustainable protein.

As the number of people adopting a plant-based diet increases, so does the market for cheese and milk alternatives. While milk made from plants has taken off with hundreds of successful options, finding a decent cheese alternative can be difficult. According to the market intelligence agency Transparency Market Research, the global vegan cheese market could reach \$2.5 billion by the end of 2020. Vegan cheese products are becoming increasingly popular as consumers and producers move away from traditional dairy products. In this edition we highlight New Roots, Bute Island, Miyoko's, Violife, and Daiya, as a sustainable and health-conscious option



“We believed that old school cheese-making technology based on animal milk was no longer a status quo we could support knowing what we know today about its environmental impact, health issues and animal welfare challenges”.

Sorosh Tavakoli,
Founder & CEO de Noquo Foods.

BEST PRACTICES

Noquo

They hope to develop a cheese with minimal environmental impact and great taste. Alternatives are usually made with coconut oil and vegetable starch or nuts, but Noquo is making its own with legumes (derived from the fruit or seed of the plant). They expect it to slice, melt and, perhaps most importantly, taste like the real thing.

Novameat

This startup aims to accelerate the growth of the sector by providing technology that will bring the next generation of products to the market. As it is becoming evident that the industry is moving beyond hamburgers, Novameat is developing the next generation of whole muscle cuts made from plants. Their technology has already allowed them to create what has been credited as the most realistic plant-based steak and fibrous pork meat in the world. They are manufactured through their patented micro-extrusion process, which biomimics the composition of the animal's muscles - both at the macro and micro levels, simultaneously exhibiting their unique texture, flavor and appearance.



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“The Biotech sector has supported the pharmaceutical sector for the last 30 years. Now FoodTech will support the food sector in its transformation. We have already experienced this process in Biotech; it was successful, and more than half of the pharmaceutical products today were developed in small or medium size biotech companies.

The world of food ingredients is on the rise, new options are available and discussions on labelling are forcing us to look for natural and sustainable sources, abandoning old, low-cost chemical-type ingredients. Cellulose derivatives, pectin, etc. must be replaced by better alternatives.

The R&D of new food has just begun. The Beyond Burger 5.0 in 2 years, will be nothing like the Beyond Burger 2.0 that you buy today in the supermarket. Cultured meat, as a source of protein for food, will have its moment when it can reduce the cost; today with a cost of about 9 euros a hamburger, it is still a very premium option for gourmet restaurants. To have volume and really solve the food problem we talked about at the beginning, a hamburger must cost less than 1 euro. I believe that hybrids of animal protein, cultured protein, and vegetable protein/oil hybrids will have a wider commercial opportunity because of competitive cost and because they would cover a large part of the claims made by 100% cell culture-based products.

The food to come: ready-to-eat/ready-to-cook, great-tasting, with texture like the natural product, nutritious, healthy, conveniently priced, scalable at the production level and environmentally friendly.

Proteins, alternative fats, fibers, flavorings, etc., will evolve and many options will appear. Today we have 4 companies that texturize proteins, 5-6 types of proteins available and about 5 edible oils... This is going to change and we will be the leaders of this change”



Andrés Montefeltro,
CEO Cubiq Foods.



EAT JUST

Singapore has given its regulatory approval to the world's first "clean meat" that does not come from slaughtered animals. The decision opens the way for the San Francisco-based company, Eat Just, to sell laboratory-grown chicken meat. The meat will initially be used in Nuggets, but the company has not said when it will be available. Singapore is becoming a major mover in the global food industry.

Universidad de la Rioja

Emilio San Martín, researcher of Biological Chemistry at the University of La Rioja, has developed a methodology to analyze meat fats with NMR spectroscopy. In a single 15-minute experiment, this method is capable of both providing compositional information and quantifying substances that indicate lipolysis and oxidation. Thanks to these advantages, fat analysis is greatly simplified, which facilitates the study of meat fat evolution throughout the transformation process.

FEATURED SUCCESS STORIES



FEATURED SUCCESS STORIES





Aleph Farms

This company has been producing cultured steak that does not involve the slaughter of animals and only takes three weeks to grow. Aleph Farms has produced meat on the International Space Station and has now launched a new program called Aleph Zero that allows meat to be produced even in the harshest and most remote environments such as Mars. If successful, the program could result in alien food production, one of the main barriers to long-term space missions. The company hopes to build its first BioFarm by 2021.



FEATURED SUCCESS STORIES

Vuna

Nestle has developed Vuna, an alternative to plant-based tuna. The product has been developed using the same technology used today in its plant-based meat alternatives with six ingredients: water, pea protein, wheat gluten, grape seed oil, salt, and a natural blend of flavors. At present we can only find Vuna in Switzerland under the brand Garden Gourmet.



FEATURED SUCCESS STORIES





CUBIQ FOODS

This company is leading the development of the first platform to produce food fats using new technologies. It currently has three product lines:

SMART FAT: consists of a healthy vegetable oil and water emulsion, stabilized with vegan ingredients (of vegetable, algae or microbial origin), which is used as a substitute for the fatty components of food. This emulsion contains between 40-50% water and makes it possible to reduce the caloric content, the amount of total fat and, depending on the vegetable oil used, to determine the fatty acid profile of the food.

MicroO3: a microcapsule of about 30-50 microns in size that contains algae oil with a high omega-3 content. These microcapsules protect the oil from oxidation and degradation and facilitate the incorporation of concentrated omega-3 oil into foods.

Cell Based Omega-3: Omega-3 consumption is growing by 14% each year and the main source of omega-3 worldwide is wild fish oil (anchovies and sardines). This source has already been depleted. As a unique sustainable and scalable alternative, we have microalgae oil, which is grown in reactors and extracted with expensive chemical processes. Algae oil has a high concentration of omega-3 and is sold at prices of between 50 and 60 euros/Kg. Cubiq Foods is developing an alternative to produce omega-3 with cells of animal origin in bioreactors, following a process like that of cultivated meat, starting production from duck embryonic cells and multiplying their quantity/volume until they reach the desired biomass size and then, differentiating them into adipocytes.





Mirroring nature under controlled conditions to grow cell-cultured meat

The rising availability of alternatives to meat, made from vegetables, starches, oils and synthesized proteins, attempts to mimic the taste and texture of meat more closely than traditional substitutes we've been familiarized with for ages. Among them are lentils, mushrooms, tofu or seitan. The belief underlying this approach is to reduce meat consumption by offering consumers a selection of products which resemble meat in their gastronomic functions, appearance, and preparation.

While the jury is still out on whether plant-based products can taste or cook similarly to real meat, pressure on food systems to increase the availability of meat products has not disappeared from our world, but on the contrary – it has been lingering more frequently than ever before.

A different approach which is established on a natural phenomenon which happens in nature – is established on the acknowledgment that meat is a rich source of well-absorbed iron, and a concentrated source of B vitamins, including vitamin B12 which is absent from plant foods. This approach which takes on the task to bolster and strengthen the protein with quality real meat, is offering to cultivate meat directly from its building blocks – the cells – instead of raising and slaughtering the animal. The core concept behind this method lays in the appreciation to a natural phenomenon occurs in nature. The process of 'Tissue Regeneration' naturally occurs in animal's body, the same as in ours, when tissues renew and grow to repair or replace old tissues.

This highly effective phenomenon can be facilitated under controlled conditions, once the cells responsible for this process are obtained and are 'fed' with the right nutrients that enable them to multiply and grow. One famous research in the field of tissue engineering, is Prof. Shulamit Levenberg, the Dean of the bio-medical engineering department at the Technion - Israel Institute of Technology. For over 20 years, Prof. Levenberg has developed a tissue engineering platform with medical orientations, set to repair tissues and lead a change in the world of biology and medicine. But there are also additional applications that this phenomenon can be adjusted to. It can benefit food designers with mirroring the full 'meat experience' with the familiar texture, the look and the taste of the meat we've always known.

One company in the field of cultivated meat, focuses on growing steaks directly from cells – is Aleph Farms. It does so by first isolating a small sample of cells from a

living animal and nurturing those cells in a controlled environment with nutrients, vitamins, sugars, and proteins essential for their growth. The idea behind the design of steaks directly from cells, lays in mirroring the natural environment in which the cells in the animal's body grow – enabling them to multiply and form the same meat as they would have formed, if they were still in the animal's body. Producers of this new category of meat, which is yet to be commercially available and is still in development, have been racing to develop the industry's holy grail, and not a minced meat product which can be available in plant-based subtitles as well.

The capability of Aleph Farms to produce a whole-muscle cuts of meat is established on an innovation which has been discussed above in the medical world, by Prof. Levenberg – for growing tissues for transplantations which can then cure diseased patients. Once this technology was transferred onto the food world, it has granted Aleph Farms with a ground-breaking result: a steak which hasn't involved slaughter of animals and which took only 3 weeks to grow. In a process in which different cell types have adhered, multiplied and grew on an animal-free "scaffold", a substitute to the extra-cellular matrix that provides the infrastructure on which the cells grow, proliferate and continue to expand – a slice of beef steak was formed outside of the animal's body.

December 2018, the Wall Street Journal revealed the first slice of steak cultivated by Aleph Farms – a significant milestone in the timeline of food systems. This was the first time when consumers, traditional producers and journalists have started recognizing the depth of the potential which lays in nature-inspired methods – dedicated for cultivating real meat. It has become feasible.

Aleph Farms





GUT HEALTH & WELLNESS
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04

Gut Health & Wellness

A deeper knowledge of the human genome is providing answers about how can we prevent and cure diseases through precision nutrition. Consumer wellbeing is a promise that the food industry can guarantee through functional foods and genetically adapted food. This is how an era of study of the infinite possibilities of this field begins.

GUT HEALTH & WELLNESS
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The microbiome, and the products and habits associated with improving its condition, are much more than just one of the main trends in the food sector. Microbes, bacteria, viruses and fungi are present almost entirely in the gastrointestinal tract and perform functions vital to the health and well-being of people.

“Let food be thy medicine and medicine be thy food”.

Hipócrates,
“Father of Medicine”.

Despite being almost unknown to the scientific community, recent discoveries have been made that show that the microbiome occupies an important part of our body: the intestinal microbiota weighs between 1.5-2 kg in 70kg of an individual, and we can say that more microbes inhabit our body than human cells, almost in a ratio of 10:1.

Furthermore, it has been discovered that the state of the microbiota is directly related to the health and illness of people, specifically with diseases such as irritable bowel syndrome, certain types of cancer, visceral fat, allergies...and even psychiatric diseases such as depression.

For this reason, consumers are paying more and more attention to their diet to improve their health. People are beginning to investigate and ask themselves: What is the microbiome? How do I prevent disease? How do I build a strong immune system?

The scientific community agrees that a varied diet, prebiotics, probiotics and postbiotics should be adopted to improve gut health. This is a great opportunity for companies in the food sector; by exploring this blue ocean they will be able to take over part of the market. According to Mintel, the number of online searches related to intestinal health grew almost 700% in the last year. Considering that the pandemic has raised much more interest in ingredients and solutions to boost the immune system, this number will likely be higher now.

The incorporation of ingredients considered beneficial for gut health will increase, both as final solutions (supplements) and as food ingredients. The rise of this smart food meets nutritional needs and provides benefits for the holistic well-being (body and mind).



BEST PRACTICES

Masa Mater

Masa Mater is a new product developed by Darwin Bioprospecting Excellence, a startup formed in part by members of the University of Valencia. It is the first active sourdough powder that allows you to make bread at home easily. It contains a selection of particularly aromatic lactobacillus and wild yeast, combined with top quality organic flour. Each 100 g sachet of Masa Mater, mixed with flour, water and salt, results in 1 kg of sourdough bread.

Alacarte Ventures

The first machine that reduces the amount of alcohol and the caloric value of wine and spirits.

Human Food

Human Food bars contain essential nutrients that can be difficult to obtain from a plant-based diet, including 100% RI of vitamin B12, at least 50% RI of iron, calcium, vitamin D, magnesium and Omega 3, and more than 12 grams of protein. Each bar also contains full daily amounts of functional ingredients.



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“As Woody Allen said: bacteria, those microscopic beings that can only be visualized with the help of a microscope, were the first inhabitants of the earth and will probably be the last to leave it. Moreover, they are the most abundant living beings on the planet. Experts in microbial ecology estimate that there must be around of 5 quintillion bacteria, or in other words, for every human being on the planet there are almost a trillion and a half bacteria.

An important part of that microbial biomass lives in the soil where our edible crops grow, in the digestive tract of our farm animals or inside our own body. Until a few years ago we hardly knew anything about this. We only quantified the microorganisms we were able to see with the help of the microscope or in culture plates.

Everything has changed thanks to the application of massive genome sequencing techniques. With them we have determined that in our body there are as many of our cells as there are bacteria swarming inside. They are particularly numerous in the skin and, surprisingly, in the digestive tract.

To put it in figures, if we weigh seventy kilos, almost two of those kilos are the bacteria that populate our digestive system. In fact, they are spoken of the forgotten organ, an organ that has not been described to date and that has a transcendental relationship with our health. This bacterial ecosystem is responsible for extracting energy from the food we eat, for activating our immune system and for modifying or destroying substances we ingest that may be healthy or harmful to our health.

We call the group of bacterial species that populate our digestive tract the digestive microbiome. Each human has its own digestive microbiome, although they can be grouped into similar groups called entero types in healthy individuals. Our microbiome can vary according to age, diet, the use of drugs (mainly antibiotics), and illnesses. These changes are usually reversible and open the door to the development of new foods and drugs containing bacteria and/or metabolites that put back our digestive microbiome to its original conditions or have a positive impact in it.

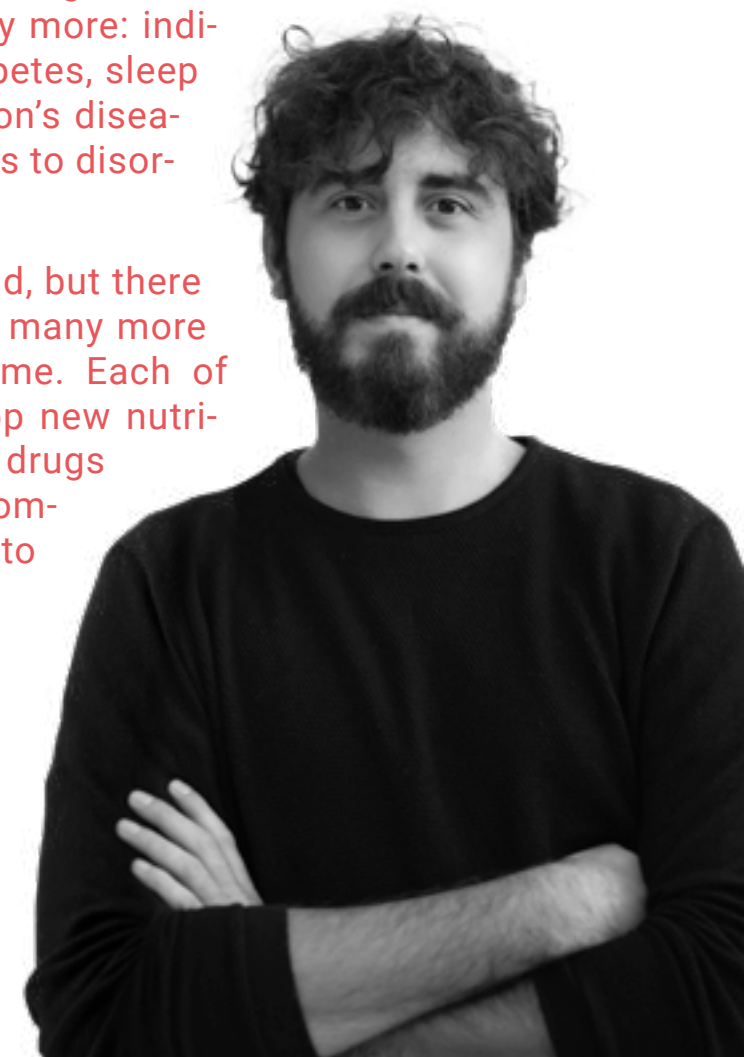
For example, celiacs have a digestive microbiome with a high proportion of enterobacterial species and less bifidobacteria or lactobacilli. This alteration is called dysbiosis and is to some extent, responsible for the intestinal inflammation suffered by these patients. In our company we have developed a probiotic that, as demonstrated in clinical trials with celiac children or adults with gluten sen-

sitivity, can rebalance their digestive microbiome. Celiac disease is not an isolated case of an altered microbiome.

We have also found that children with moderate atopic dermatitis problems (20% of children on the planet) or adults with psoriasis, have clear imbalances in their digestive microbiome. In other words, their skin problem has its origin in their digestive system. Based on these imbalances we have designed consortiums of probiotics that have worked in clinical trials.

To close this short list of pathologies linked to changes in the digestive microbiome, it is worth remembering that in obesity there is also a dysbiosis. In this case, obese individuals have an increase in a specific group of bacteria called Bacteroidetes and a decrease in another called Firmicutes. In obese individuals who follow hypocaloric regimes and lose weight, this imbalance is recovered. Several companies, including ours, are tracking probiotic bacteria that give rise to similar responses. But there are still many more: individuals with autism, ulcerative colitis, diabetes, sleep disorders, anxiety, Alzheimer's or Parkinson's disease, and many other ailments that have links to disorders in the digestive microbiome.

There is still much to study and understand, but there is no doubt that the near future will bring many more surprises around the digestive microbiome. Each of them will be a new opportunity to develop new nutritional supplements, specialized foods or drugs with high added value, both socially and commercially. We will have to be very attentive to these advances”.



Daniel Ramón Calvo,
Global Marketing Specialist B2B
Microbiome Solutions
Health & Wellness - ADM Nutritions

Precision Nutrition

We believe that there are certain ingredients and formulas that can help a consumers achieve specific health-related goals. Genomic studies are working to present a solid personalized nutrition offer in a few years.

The reality is that we still do not know between 95% and 99% about the composition of food, and when designing a healthy diet, it is necessary to consider not only the ingredients included in it, but also the conditions in which they are consumed: how ingredients are combined, how they are cooked, the environment we consume them in, etc.

It is important for the industry to be able to incorporate beneficial properties into foods consumed daily instead of offering them in the form of a pill. The boundary between the pharmaceutical and the food sector is becoming blurred, and there are many examples of food companies investing in health, and vice versa. One example is Nestlé, with investments in Aimmune Therapeutics.

We are looking for foods that provide a better general state of being to people and good aging. Initially, foods will not be personalized according to the individual characteristics of each genome, but there will be a tendency to understand genomic patterns with similar needs with the aim of democratizing precision diets. Functional foods will play a key role in this process, to achieve, to achieve a specific mental and physical state. For example, to be able to relax, to be activated, to reinforce their immune system...



BEST PRACTICES

Danone Planetary Beverage

The company extracts whey, a natural product full of healthy nutrients that is usually discarded in dairy factories, from the milk of grass-fed cows. Planetary Beverage uses this whey to produce a tasty and nutritious drink

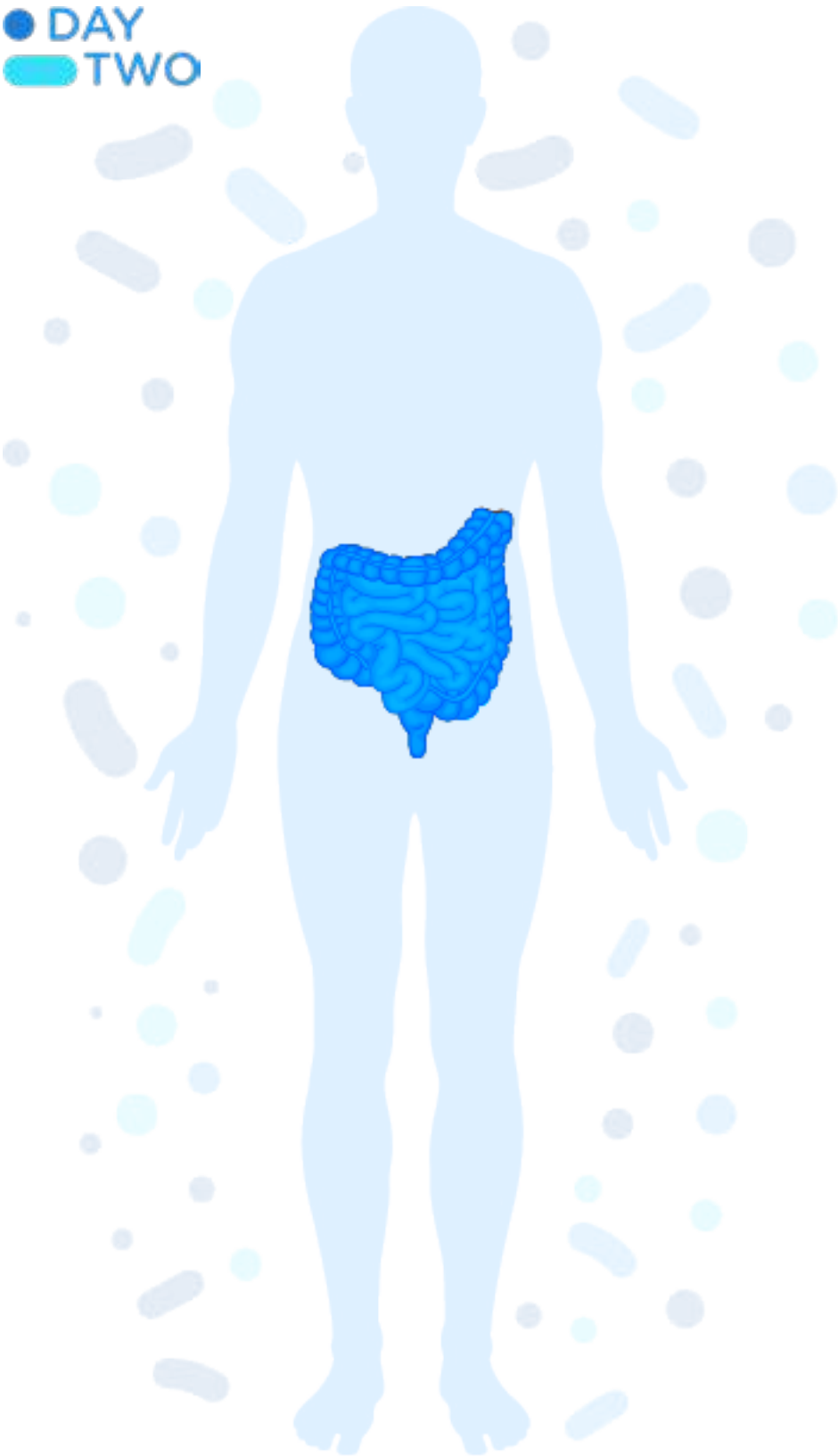
ReGenius Loci

A device that can determine the amount of nickel in foods/liquids in real time and in-situ so that nickel allergic individuals can make decisions based on foods they want to eat

Dulcesol

The new 0% milk bread product from this company adds to the range of products without added sugars that the brand already has: whole meal croissants and muffins. Like these, the 0% milk bread is handmade with natural ingredients, without palm oil, colorants or preservatives, and its sustainable packaging reduces use of plastic by 80% and can be recycled in a blue paper container.

DAY TWO



BEST PRACTICES

Periodic Table of Foods

Led by the Rockefeller Foundation, this project aims to create a global public database that collects the biochemical composition and function of foods consumed on all continents, through bioinformatics and spectrometry.

Day Two

This Israeli company provides a home kit for testing feces, and after a digestive microbiome analysis performed in a laboratory, the customer receives through the app recommended foods and diets meeting his or her needs.

Trivio

The chef Jesús Segura experiments with fermented food in his restaurant Trivio (Cuenca). Through bran fermentation they manage to provide an intense umami flavor to the vegetables. They have also experimented with cheeses from cereals, inoculated bacteria, and emulated cheese fermentation, all without animal protein.



National Genomic Data Bank of China

This center of about 50,000 square meters in Shenzhen is currently the sequencer for human, plant and animal DNA, and contains the most genomic data in the world. They claim to have sequenced the genome of more than 100,000 species of animals, plants and microorganisms using public funds.



Inside Tracker

An ultra-personalized nutrition system based on the analysis of biochemical parameters in the blood and the genome, to provide lifestyle and diet recommendations. It monitors progress and adapts recommendations based on individual response.



Habit

After a kit and a shake are shipped to the customer's home, the customer is asked to have an analysis done before and after the drink is consumed to understand the body's response to specific nutrients. Based on the results alongside a study of the person's habits (shopping time, preferences, etc.), the client receives weekly food kits at home.



Friska

This supplement company aims to improve well-being by working on gut health. The formulas contain a digestive enzyme that promotes better digestion. In addition, it contains probiotics that take care of the balance in the digestive system, and natural extracts that improve the general state of well-being.



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“Sometimes, to gaze into the wonderfully wild possibilities of the future we have to pause and look back – perhaps there’s a “why” piece that was once missing we can now place? Or we can reflect on how have we evolved so we can better utilise what nature already offers? Perhaps we can use advanced areas of science and innovation to go back to the simple things and explore why and how they’ve worked and/or been ignored as we hurtle towards all the excitement of what the food industry could bring in the coming years. This is most definitely the case when it comes to the gut microbiome and gut health in general and how food can impact. With all the technological advances in DNA sequencing, it’s staggeringly cheaper and quicker to explore what microbes are living (and passing through!) our gut, what makes them tick and how the food industry can adapt to take advantage of advancing science.

Don’t get us wrong, there are some exceptional advances being made in the frontier of “at home” microbiome testing, personalised probiotics and even toilets that can analyse your poo. Let’s not forget, science is still in its infancy is this area. We’ve learned we also need to strip things back to basics and look at age old tales of fibre, the ancient art of fermenting and moving away from all the emulsifiers and preservatives we’ve pumped into our foods in western modern diets.

Nothing demonstrates this more than fibre, it’s not an alien concept but it is the unsung hero of nutrition. We see fibre as being the forgotten component to our diets and one that can drastically make a difference to an individual’s wellbeing and gut health. 90% of us aren’t getting enough as it’s got lost in the sea of low carb diets and high protein tidal waves.

A reminder: Fibre is a type of carbohydrate either naturally derived from plants or extracted and added into product as isolated fibre. Unlike some carbohydrates, fibre cannot be digested in the small intestine (which is why we may have ignored it for so long!) and so passes through to the large intestine where the magic happens.

Not only does fibre bulk your stool but it provides important fuel for the community of microbes living in your gut, which in turn produce health promoting by products that provide fuel for your gut and have many other functions. Fibre is abundant in plants and most of us will be eating some, but people assume it’s just prunes and cereal and don’t realise there are MANY MANY sources of fibre (its not just about insoluble vs soluble anymore) and so many different kinds.

Not only does the diversity of types and sources mean the innovation possibilities are infinite, we believe the future needs to involve more education around fibre, it does far more than just “help you go” and the fantastic thing about fibre is that it’s accessible and affordable to everyone. People are already eating it; they just need more!

We want to champion fibre. We see part of this as an educational piece to require mandatory fibre labelling on pre-packaged products to help the consumer understand how much fibre is in the food they are consuming - this would mark real progress for the category of “gut health” and pathway for a new generation of high fibre products.

This may seem like a modest, slightly dull, regulatory slant on a prospective goal for the future of food, but sometimes we need to listen to our guts and go back to the very beginning”.



Lisa & Alana Macfarlane,
Founders The Gut Stuff

FOOD SERVICE AND RETAIL
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05

The future of food service and retail

We are in a time where traditional forms of shopping and dining experiences are at risk. How can we continue to relate to customers in a human way while respecting distances, and how do we create memorable experiences in times of zero contact? We will experience changes that will continue over time.

FOOD SERVICE AND RETAIL
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FOOD SERVICE AND RETAIL
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“The future is already here, but it is not evenly distributed around the world”.

William Gibson,
American-Canadian science fiction writer.

Last year, when we were reflecting on the restaurant of the future, we imagined it as a space where someone could live an experience, also supported by technology and innovation. What did not fit in our forecasts was the fact that the digitalization of the restaurant, understood as its online presence, was going to be a necessity to survive.

The HORECA sector is facing great changes due to the important restrictions imposed to guarantee social distance. In addition to this, there is a challenge that has already grown in importance in recent years related to changes in consumption habits - such as, for example, food at home - in which the digital barrier is no longer an impediment. Thus, delivery models are growing in importance in the market, where traditional and virtual restaurants have a place.

pivoting) towards delivery models, online supermarkets, or food kit services. Thus, arises the need to offer consumers healthier and more affordable options due to the increase in frequency of this type of consumption. Initiatives such as Take A Restaurant, allowing diners to live the restaurant experience in their own homes, recreating the environment while ensuring maximum security, have also grown

We also focus in ‘Fooduristic COVID-19 Special Edition’ on, how many food services companies are opening (or even





The food service as an expert ally in the adaptation for the current and future panorama

“In The Cooking Clubster, we have always advocated, first, as Darwin recommends, the understanding of the real situation to know what we have to adapt to. That is why we’ve created our own analysis tool ‘Gastronomy analytical process’ (GAP) to help companies craft a vision, or as we call it ‘gastrography’. This tool has been used for years in projects for brands such as Room Mate, Gran Dominé Hotel and MasterChef among many others. We have worked on different creative projects, based on answers extracted from the information of that tool. Information is power, and with this tool we can not only evaluate the client but also their competition.

This obsession for real, tangible and measurable data (qualitative and quantitative) has led us to try to be pioneers in understanding the current situation and its future impact, carrying out, for example, in period of confinement, the first online congress of gastronomy or the co-creation of Cubik, the HUB of innovation for sustainable food service for the city of Barcelona, not only to adapt and grow in these strange times, but to also be able to contribute ideas and proposals to the sector.

This analysis of the situation at hand has allowed us to help our clients under these new circumstances, with the application of ‘Plate Thinking’, our innovative tool for the creation of products or services based on four basics that we believe are fundamental: **creative elements, ingestible elements, experiential elements and auditable elements**.

A clear case of the application of this methodology is ‘Cyr clo’, one of our projects in Madrid. This tool has allowed us to adapt the gastronomic offer quickly

and carefully to our own ‘delivery service’ or a personalized ‘delivery experience’, which, along with many other actions, will allow us to grow exponentially even with the discouraging data we predict for the sector.

The future of food is living through a time of challenges. The support of a food service expert, with a high degree of strategic vision, can be the best investment to not only survive these challenges, but to also be sustainable and lasting leaders over time..

Innovation is the best tool for sustainability”.

Jorge Bretón,
CEO en The Cooking Clubster



Brick & Click model, a hybrid between physical spaces (brick) and online sales models (click) will replace the traditional Brick & Mortar model, which only allows access to offerings in physical spaces.

“It is not the strongest of the species that survives, not the most intelligent that survives. It is the one that is most adaptable to change”.

Charles Darwin,
English Naturalist and father of the theory of evolution.



Hoteliers are faced with the challenge of playing in this new hybrid model in which, although their physical restaurants will continue to have an important place for their businesses, they will have to rely on online sales models to complement the losses due to the lower occupancy allowed in their restaurants.

This is where management becomes essential in this sector, which had been reluctant to accept that this, as in any other sector, is the only mechanism for controlling operations and costs.



Perspectives on the future of food service in the post-COVID era

“This moment of tenuousness that the food service sector finds itself in has made it clear that the current model is not sustainable. Restaurateurs, who have hitherto subsisted on very tight profit margins and dependent on customers entering and purchasing in their physical spaces, have seen their operations threatened by social distancing and confinement measures. Approximately one in four restaurants will close.

Some restaurants that had opted to invest in the re-design of their premises to reduce the cost of the food served, are now at a dead end and the future of their businesses is full of uncertainty. Nevertheless, the end of restaurants is not near. Rather, a new paradigm is emerging in which cost optimization and digitalization of ordering will be essential to survive through restrictions.

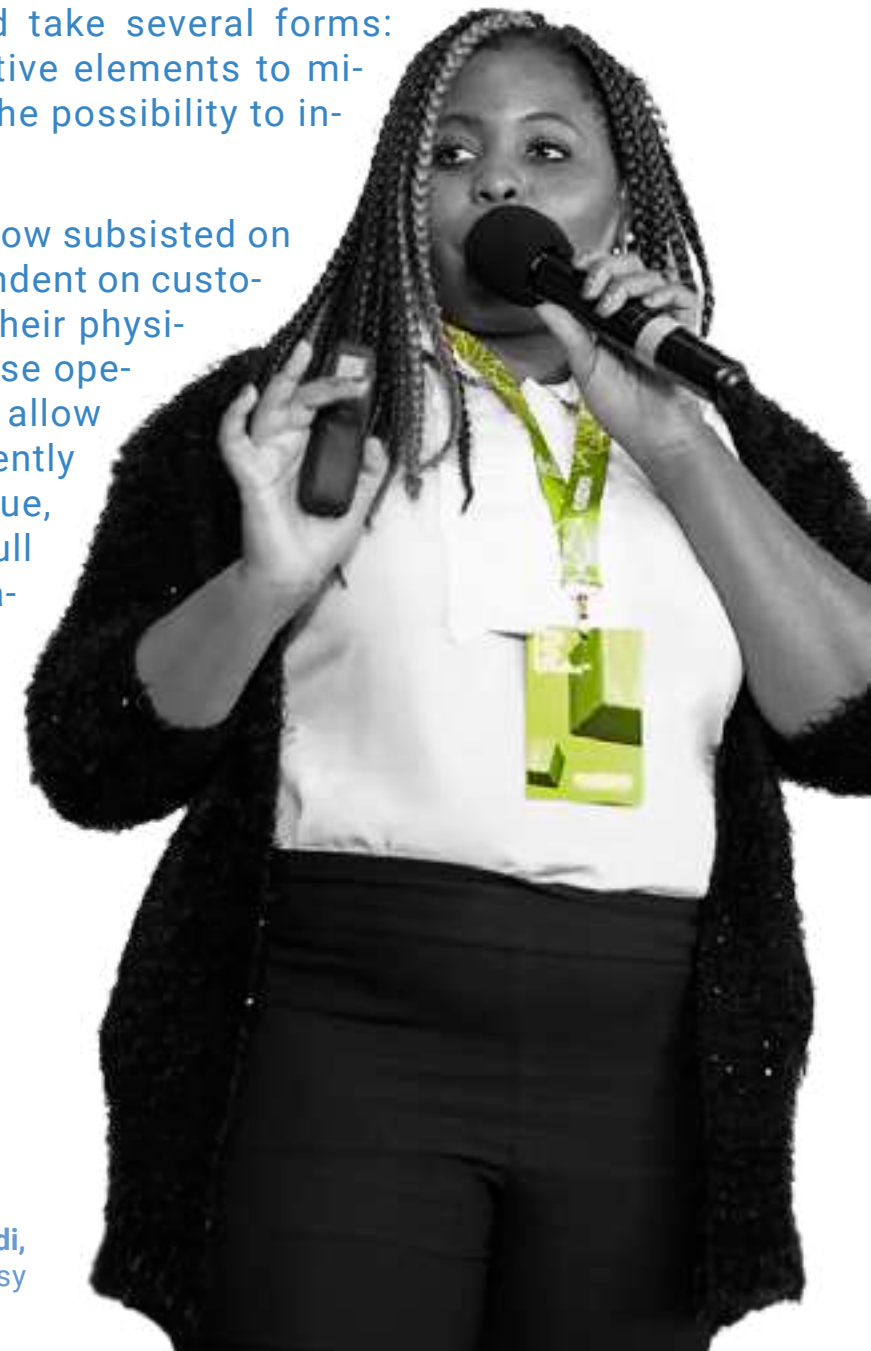
Even though other business models such as home chef services or virtual restaurants have not held special weight in the HORECA industry historically, mainly due to limited marketing avenues and the customers' preference for experiences in the physical restaurant itself, these business models now have a competitive advantage over traditional models due to their more simplified operations. This alongside changing consumption habits and a growing taste for gastronomic experiences at home -in a safe environment- will surely favour the growth of this type of offering.

Apart from delivery, we see a desire to enjoy unique experiences at home, with the comfort and convenience that this entails. This demand is driven by the fact that more consumers are working at home (and therefore eating more at home overall) but missing the novelty that eating out provides.

The agility of those operating in the virtual food service environment allows them greater financial and operational capacity to provide experiences to a homebound audience. The experiences could take several forms: transforming homes with decorative elements to mirror the restaurant environment; the possibility to interact with the chef, etc.

It's restaurateurs, who have until now subsisted on very tight profit margins and dependent on customers entering and purchasing in their physical spaces going to be key for these operators to adopt technologies that allow them to reach consumers efficiently and communicate their brand value, since they no longer have the full benefits of physical restaurant space to reinforce their brand value”.

Tanaka Mawindi,
Founder and CEO of Salsy



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“This is a story of a business pivoting during Covid-19 to meet two urgent needs: what to do with food waste from shuttered restaurants, and how to feed the hungry and food insecure. Feed the Mass, a non-profit cooking school teaching healthy cooking to diverse youth in Portland, Oregon, USA, had to close in April due to COVID-19. In May, they adapted their business to prepare free meals to those experiencing food insecurity who cannot pay for food delivery to their homes. They began serving just 200 meals, 3 days a week, using food products that would otherwise be wasted.

The support and interest in their work blossomed quickly, with celebrity chefs and restaurants donating food and professional skills, creating from-scratch restaurant quality meals for those in need. The result: local farmers and ranchers have an avenue for their produce, and people are fed.

Four months after pivoting the business, the ‘Fed’ program now serves ~7,000 meals weekly, distributed by volunteers who safely deliver meals across the city and within their own neighborhoods. This is a beautiful example of a community stepping up during an unprecedented crisis, where food is not wasted and the food insecure are not forgotten”.

Abby Fammartino,
Volunteer at ‘Fed’ program



The lines that divided food service from retail are becoming increasingly blurred. Years ago, we saw the emergence of grocerants (grocery + restaurant) that not only sell ingredients but also position themselves as places to consume ready-to-eat dishes.

We also find that virtual restaurants are beginning to offer services typical of supermarkets.

This is more and more, a unique playing field.

BEST PRACTICES

Salsy

Salsy connects gastronomic entrepreneurs with new consumers. This platform and software drives the next generation of culinary experiences, from experiences provided by renowned chefs to virtual restaurants and food trucks. Whether its communicating to the right audience or finding kitchen staff, Salsy helps entrepreneurs focus on what really matters: creating extraordinary experiences and generating sustainable business.

Wetaca

This home-cooked meal service offers home-cooked meals with the promise that you only need to spend 3 minutes preparing the daily menu. It meets the need to offer healthy and convenient solutions for everyday life.

Hermanos Roca

The partners of El Celler de Can Roca have launched a new project: "Sustainable gastronomy". They provide a meal kit service where they highlight the history of the producers and accompany it with recipes and advice for healthy cooking.





“If anything has confirmed the situation generated by the COVID-19 it is that we are in an increasingly uncertain, extraordinary scenario that requires an enormous capacity to adapt (almost) in real time. Excellent in times of uncertainty does not decline, but rather the opposite.

And in this sense, some of the lines that will determine where the evolution of retailing will take place are beginning to be drawn:

This extraordinary situation has generated new ways of thinking and new ways of working for many companies. Restaurants have reorganized duties, have modified services, have reinforced their protocols... but the expectations of their clients have remained the same. Consumers have continued to demand the same or higher quality products and have continued to seek an emotional connection with the brand/restaurant. This duality will continue to be reinforced in the future, making excellence and commitment key priorities for management as well as meeting diverse needs.

Service improvement will also be fundamental. We have seen how the pandemic has made technology companies develop solutions quickly. All of them have developed solutions designed to adapt to emerging needs. And this is achieved by actively listening and being able to anticipate needs that may arise. For example, when procedural safety was about becoming a top priority, Deliveroo pioneered functionality to deliver orders without contact, thus ensuring safety and hygiene for riders, restaurants and consumers.

We will continue to move towards an experience that increasingly intersects all channels. This implies the ability to offer similar brand interaction regardless of the channel, moving towards a practically infinite channel. Sometimes this will require digitalizing and sometimes the opposite. For

example, Deliveroo enabled a telephone service during confinement so that people without internet access could place their orders.

Of course, we cannot forget about the offerings that customers have access to variety, service and price will continue to be aspects to consider. This is happening in an environment where more and more establishments are joining. One of the great changes during this pandemic has been the incorporation of restaurants and stores that previously they didn't offer home delivery. Numerous local restaurants, renowned chefs or supermarkets and food stores are new players in this sector and, without doubt, there is a great way to continue moving forward in this area.

With these clues, we can see that tomorrow's food service will most likely be what the consumer decides at any given moment. But It is always accompanied by the banner of operational excellence and emotional connection”.

Carolina Pérez Rioja,
Communication Director at Deliveroo





Towards a more sustainable, healthy and affordable future

“30 million of people eat in our stores in Spain every year. In fact, our restaurant area -which includes our restaurants, bistro and Swedish Food Store areas- is a key part of the overall shopping experience we offer our customers. As IKEA founder Ingvar Kamprad said, ‘it is difficult to do business with someone with an empty stomach’. Therefore, although our main activity is linked especially to the world of decoration and furniture, at IKEA we are strongly committed to this part of the business and we strive to move towards healthier and sustainable foods that are affordable for most people. With our gastronomic proposal, at the same time we are bringing Swedish cuisine closer and making a visit to IKEA an ‘around-the-clock’ experience.

During the last few years, we have seen a changing trend in people’s diets. As consumers, we are more aware of how our decisions affect not only our health, but also the planet. We are increasing the importance of looking into the origin of products, animal welfare, plant-based products, sustainable business, waste management, among many other things, when making our consumption decisions.

At the same time, in a society more and more accustomed to consuming where, how and when it wants, experience is becoming a more critical factor for the food service industry in these turbulent times. At IKEA, we have been working for years in initiatives to approach the consumer from our vision: to create a better day-to-day life for people and the planet.

One of the projects that has had the greatest impact is related to responsible consumption. We realized how much food was being wasted in our restaurants and decided, through our ‘The Value of Food’ campaign, to commit to reduce the food waste. To do this, we installed smart scales in the kitchens of all stores that allow us to quantify, record and know the origin of food waste. Since 2017, when we started this ambitious project, we have managed to reduce food waste by 30% in our 16 stores in Spain, something we are very satisfied with. This reduction means that 150,000 kg less waste has been generated since we launched the project, which is equivalent to more than 500,000 plates of food and the non-emission of 800,000 kg of CO2. The most valuable component in this process is the awareness of the more than 8,000 people who work at IKEA. Our goal for 2020 is to reduce in-store food waste by 50% and not send organic waste to landfill; and by 2030 we want to be able to recycle 100% of all waste from our own operations, last year we managed to recycle around 80%.

Another focus in recent years has been expanding our plant-based offerings and sustainable products. We launched a vegetable hot dog, a strawberry vegan ice cream, two types of seaweed caviar and our most talked about launch, the new vegetable protein meatballs, with a texture like meat, but with only 4% of the carbon footprint compared with traditional meatballs. Little by little we have been expanding our sustainable and healthier food offerings. One of the keys to the success of these products is their taste. It is not enough just to get the product out, but to really get the consumer to change their choice for the taste.

Since 2015, all fish and seafood offered in our restaurants has been certified by the Aquaculture Stewardship Council (ASC) and Marine Stewardship Council (MSC), which ensure that products have been obtained through responsible and sustainable farming. Since 2008, all IKEA coffee and cocoa has been UTZ certified, ensuring sustainable agriculture.

At IKEA we are always exploring new proposals. One of the latest, which has not yet arrived in Spain, is the cultivation of lettuce and leaves that are served in our restaurants and in the workers’ canteen in containers installed in the parking lot of the stores. Our aspiration is to become self-sufficient in the cultivation of our own lettuce through vertical agriculture, this would be to offer products of greater proximity.

At IKEA, we like to show that things can be done differently and use our influence to inspire new solutions and improvements. We know that our daily behavior can have a positive influence on making this world a better place to live in and we believe that with our approach from the IKEA Food area we are achieving this, although we still have a long way to go together”.

Carlos Cocheteux,
Country IKEA Food Manager at IKEA Spain



Contrary to what seems to be the global trend towards digitalization, physical stores and supermarkets are still the preferred shopping channel for Spanish consumers. Local stores have achieved more importance during this crisis, as society has been focused on supporting the economic recovery of the surrounding area. In fact, local

stores have gained value: from a 15% market share to 19%. Direct-to-consumer platforms are also growing exponentially in the form of consumer communities of local producers.

Data will direct retail operations. Consumer adoption of digital has accelerated, making us advance in just months the adoption of these technologies applied to online shopping. We are talking about a consumer who demands convenience, who knows what he wants and isn't committed to any supplier.

As we mentioned in Fooduristic Covid-19 Special Edition, online sales have been significantly accelerated by the circumstances and solutions adapted to different lifestyles of consumers. Among them, click and collect, allowing consumer to make purchases online and collect in store, e-commerce in supermarkets, specialized marketplaces, channels like Amazon, Instacart... According to data from Nielsen, click and collect has invoiced five times more than last year.

We see why physical stores could assume a big role in which they act as virtual warehouses to make deliveries to local homes in a very short timeframe compared to the current waiting times for traditional e-commerce purchases.

As for the type of products that the consumer wants to find in the supermarket lines (on/offline), there are products that allow him/her to have a diet based on his/her lifestyle. According to the study: "How the Consumer Industry Can Drive Healthier Eating", conducted by Boston Consulting Group (BCG) and Nielsen Global Connect, 80% of consumers cite price as a barrier to buying healthy foods and 85% said they would buy more often from retailers that actively promote healthy solutions. Consumers will continue to look for convenient options to spend less time in the kitchen on a day-to-day basis. Meal kits for cooking, such as those from the American company Blue Apron, are strongly coming into play.

Of course, it is still expected that supermarkets be a space where hygiene and food safety are prioritized. On their part, consumers are willing to respect protocols. Geolocation technology, temperature control, robotics and artificial intelligence, will make protocol adherence more innate and therefore less uncomfortable.

Back-office management and intelligent management of food service and retail businesses will be increasingly important to keep these businesses afloat. Total automation in the management of warehouses will make them significantly more efficient and competitive.

BEST PRACTICES

Mo de Movimiento

Felipe Turell's restaurant puts sustainability at the center of focus in its value proposition: from the care of its suppliers, the materials chosen for the interior design, to the ingredients and recipes that play a leading role.

McDonalds, Walt Disney Resort

The fast-food chain aims to create a restaurant that is 100% self-sufficient with the energy it generates. It will become a hub for the company to test solutions for reducing water and energy use.

La Mare que Va

This social project promoted by the Asin-down Foundation works to integrate people with Down's syndrome into society by offering training in hospitality. The business world can currently connect with the project by participating in events, meetings and exhibitions, opening the door for future possibilities.





Carulla SmartMarket

“Consumers are increasingly demanding, avant-garde, and standard-bearers of environmental issues. They are always connected, and seek agile experiences, with payment facilities, quality in products and in time, in addition to variety and service. With them in mind, we created Carulla SmartMarket in Bogotá, a format developed to make everyone’s life easier; this is the only ‘smart commerce’ laboratory in Colombia. We find here new technologies that improve time and customer satisfaction, and we create new developments according to their tastes and needs, without dehumanizing the retail business.

Some of the technological initiatives at the service of the client

We work with suppliers, startups and partners to create technological initiatives to make the payment process easier such as Check & Go; where the customer registers and pays from his cell phone; Smile ID: payments using facial recognition technology; and payments through devices attended by Carulla employees who have mobility throughout the store. Other technologies that improve their experience: a 3D purchase route that guides them inside the store; an E- sommelier who is a virtual wine consultant, and other technological services where they can listen to music, load their cell phones, consult news websites and access service startups; as well as lockers to leave and pick-up keys, or e-commerce orders.

Conscious consumption in Carulla SmartMarket

Carulla seeks to provide customers consumption alternatives that help them be more responsible with respect to their environment. Among these initiatives is the elimination of the plastic bag; the elimination of plastic packaging in fruit and vegetable areas, products in which the plastic label is changed to bijao leaf and for those that require packaging, friendly packaging for the planet. We also have a digital invoice, solar panels and 22 electric vehicles (zero emissions) for homes and supplies”.





The Chicken

The first restaurant in the world to serve lab-grown chicken. Created by the Israeli foodtech startup SuperMeat, the restaurant is intended to serve as a pilot kitchen for an innovative product connected to the restaurant from which diners can observe the production process of this product in bioreactors.



FEATURED BEST PRACTICES

IoT at Mercadona

The supermarket chain uses IoT technology to analyze its sales in real time and be able to predict its needs by establishing more efficient purchasing strategies, storage systems and store supplies.



FEATURED BEST PRACTICES





T11

Human touch, store design, use of technology, a unique business model, and customer relations are the distinctive features of this Chinese supermarket. Part of a booming trend in “new Chinese retail”, this supermarket puts as much attention on the online experience as offline, with differentiated proposals in these two spaces. It is focused on offering hyper-personalized recommendations and a loyalty program to customers, thanks to purchase data records.



FEATURED BEST PRACTICES

IBM Food Trust at Carrefour

The supermarket has introduced the IBM Food Trust blockchain platform, allowing the client to track and know the journey of their product from the field to the supermarket.



FEATURED BEST PRACTICES



REGENERATIVE AGRICULTURE
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06

Regenerative agriculture and genetic editing

Agriculture has a strong impact on the economy, society and the territory of Spain, which generates wealth not only through its activity, but also in the rest of the economy thanks to its interrelationship with other sectors. It is the second most important industry in the country, very close to tourism, with a contribution of 10.6% to GDP and 14.2% to employment.

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Population growth in emerging economies will be accompanied by greater economic progress. This population increase and the rise in food consumption will have a direct impact on the global food and agricultural sector. According to the FAO, it is estimated that food production will need to increase by 70% by 2050 to supply the nearly 10 billion

people who will populate the planet at that time. The increase in global food demand will be a challenge for farmers. The area under cultivation is limited, so the increase in cultivation will have to be met through growth in productivity rather than through an increase in the area under cultivation.



FAO forecasts that only 20% of the increase in production in the future will come from an increase in farmland. 80% will come through productivity improvements.

The agricultural sector has a great influence on the environment, both in terms of the use of the resources and their maintenance. Agriculture is essential, for example, to preserve the soil from erosion, which is particularly worrying in Spain, one of the European countries with a higher risk of desertification.

Spanish agricultural activity provides 7 million hectares to cultivation, around a third of the country's surface area, making it the second largest country in the European Union in terms of agricultural surface area. It also ranks second in terms of production.



Conventional agriculture reduces soil fertility and biodiversity by requiring more water and large amounts of herbicides, resulting in the presence of these chemicals in our natural environments.

Regenerative agriculture is based on improving the soil, increasing biodiversity and controlling erosion, in short, improving soil through microbiology and organic matter. This approach presents an

opportunity to reclaim our agricultural system in the name of the planet and human health, while meeting the obvious need to feed billions of people around the world. We can produce what we need and revitalize the soil at the same time, thus sequestering the carbon that currently pollutes the atmosphere and warms our planet.

"Food production is the greatest threat to the planet: we must shift our emphasis from food security to nutritional security".

Howard Yana-Shapiro,
Senior Fellow, Center for International Forestry Research and the
University of California, Davis.



BEST PRACTICES

iFarm

This Finnish company offers a vertical farming solution that can be used in a range of different sizes and environments, from large storage farms to supermarket shelf-type farming modules. The company offers four different automated technologies: one for growing various foods on a vertical farm; another one for growing strawberries on a vertical farm; iFarm Cropper, a stand-alone module for growing vegetables; and iFarm Growtune, a SaaS platform to manage vertical farms.

EIT Food

With the mission of making food in Europe healthier and more sustainable, they promote research and help expand regenerative initiatives. The EIT Food network connects artisan farmers with the world's largest agri-food companies and makes learning from both scalable and accessible. During 2020 it offered a free support program to help farmers make the transition to regenerative agriculture.



According to The Carbon Underground, every hectare of farmland restored results in an annual reduction of three tons of carbon. With five billion hectares of farmland worldwide, restoration would result in a reduction of 15 billion tons of carbon.

One of the examples of success of this type of agriculture in our country is “La Junquera”. With an area of more than 1,100 hectares and located in the municipality of Caravaca, Murcia, the farm works exclusively in organic farming and has a rotation of four crops. A project in which volunteers and European students work to learn first-hand about this type of cultivation, as well as to scientifically verify all the processes. One of the projects they are researching is to make ditches following contour lines to reduce erosion and increase water infiltration, as well as small pools of sediment to retain the floods so that they increase humidity and recharge the aquifers.

“At Basque Culinary Center, as part of our commitment with a greater biodiversity and better use of the food resources, we are creating our own organic farming project. On the one hand, as an academic project of the BCC’s undergraduate and master’s program and, on the other hand, as an experimental garden to reinforce our link with the land and explore the ancient and contemporary varieties that thrive in our territory and climate”.

John Regefalk,
BCC Innovation

The technological advances will allow productivity to increase, reducing costs and improving profitability of the farmers; becoming the main way to satisfy the future demand of food considering the environmental impact.

A representative example of these advances is the Dutch greenhouses, which are modern and specially designed to minimize the consumption of resources such as water and energy and to optimize crop yields. These glass installations are powered with technology that allows light to be projected or diffused to adapt

to thermal needs: led lighting, with advanced ventilation systems that reuse CO2 as fertilizer, systems to reuse water, anti-insect nets and a high degree of automation. Thanks to these installations, the Netherlands produces per square meter 3, 4 and 7 times more tomatoes, peppers, and cucumbers, respectively, than the greenhouses in Almeria.



BEST PRACTICES

Danone

Is working to develop and promote models of regenerative agriculture that protect the soil, empower farmers and promote animal welfare.

Patagonia

The company has expanded its activity to include products from farmers, ranchers, fishermen, artisans and like-minded businesses that offer ways to eat well while vigorously protecting the environment. Through their marketplace “Patagonia Provisions” they propose an alternative to industrial agriculture with the mission to repair the broken food chain and avoid unsustainable practices that deplete natural environments and contribute to climate change.

AeroFarms

Developes aeroponic systems to grow at high yield densities in urban vertical farms.



The most outstanding innovation in the field will probably come from the new techniques of genetic engineering. Unlike the techniques of genetic modification, which combine genes from different species, the new techniques of genetic engineering are limited to altering the genes of the plant itself, a natural process, but with shorter deadlines.

Precision agriculture seeks to optimize the use of resources precisely through the use and combination of the main existing technologies and innovations such as GPS, drones, infrared sensors, HD cameras or radar controls, among others.



The farmer of the future will have to be a multidisciplinary professional, who knows how to operate machinery, knowledge of computers, robotics, meteorology, chemistry or biology.

BEST PRACTICES

Bayer

As a result of the collaboration with the UPV, Bayer has developed Allium, the first digital tool that predicts the appearance of blight (Stemfiliosis) in garlic and onion crops. This is an advanced integrated model, with climate data from the field itself, which anticipates moments of risk and optimizes treatments. Allium sends an SMS automatically when the predictive model reaches risk situations, making crop management and treatments more convenient for the farmer.

Farm to Crag

They create a map of local food and markets near the destination of climbing areas and offer community meetings where climbers can cook and eat together while learning about their food. The mission is to facilitate the search for local, organic and seasonal food wherever one travels to climb and to connect deeper with the surrounding communities.



BCC Innovation

“During these last years some local varieties of vegetable species widely consumed in the past, are being replaced by others with a higher yield or more standardized characteristics. As a result of this, some of the genetic wealth provided by varieties adapted to local and regional conditions may be threatened. That is why they have been developing a line of work with different projects focused on the recovery and gastronomic revaluation of traditional plant varieties in the Basque Country. The differential and singular character of some of these cultures could be of low interest for their industrialization, but it can turn out to be attractive for the gastronomic and food service sector”.



FEATURED BEST PRACTICES

TULIVAS & BOKARAS

Tuliva is a group formed by 5 UPV Fornejant Ciència students, who, after several training and learning workshops, were selected, among others, to represent the UPV in the national food innovation competition Ecotrophelia 2020. In Tuliva they were certain that they wanted to develop a product as sustainable as possible, so they used olive stone seed flour as a base. Tuliva is a cookie suitable for vegetarians, lactose intolerant, diabetics and coeliacs. In addition, it has great versatility in both the kitchen and on the palate, since it can be served as an edible packaging along with cold, hot, sweet or salty dishes.

Bokaras, another UPV Fornejant Ciència project that also participated in Ecotrophelia 2020, aims to use local products to promote trade and local agriculture, using the native crops of the Valencia Region. Bokaras use collaret cocoa as their main raw material. This variety of peanuts has been grown in the Valencian field for many years, but its cultivation is in decline. The snack is made with the remaining pulp from making a peanut drink, thus inserting this drink in the Spanish trade, a secondary project with great potential that could be placed in the horchata line.



FEATURED BEST PRACTICES





Desert Control

This company not only prevents the land from further degradation, but transforms arid, poor quality soil into nutrient rich, food producing soil. To do this, Desert Control has developed a substance, Liquid Nanocarbon (LNC), which coats the sand particles creating ideal conditions for plants to grow. The most surprising thing is that it only takes seven hours to transform a piece of land from arid to arable with the application of LNC. According to the Desert Control website, a field test near Abu Dhabi produced cauliflowers and carrots that were 108% larger than those in the control area, and field tests in Egypt documented a four-fold increase in wheat yield. Recently, LNC was used to grow watermelon, pearl millet and zucchini in the desert outside Dubai.



FEATURED BEST PRACTICES

Biome Makers

This startup has opened its technology of soil health modeling (based on DNA sequencing and computer technologies) to the agricultural and research community worldwide as part of the fields4ever initiative. As a result, researchers, farmers, agronomists and companies have access to advanced tools to measure soil health and develop projects that represent a significant advance in science, technology or the economic impact of agriculture and soil.



FEATURED BEST PRACTICES





PLANT ON DEMAND

FTALKS'20 AWARD WINNER - INNOVATION CATEGORY

Plant on Demand is a software platform created for local producers helping them to sell online and become more efficient and competitive thanks to their technology. It is an online platform where users can create their own sales space in less than 15 minutes, manage all their orders automatically (picking, invoices, logistics management, route optimization) and obtain valuable analyses of their business in real time. The platform also manages groups of producers, food hubs, cooperatives, or markets in a centralized way. The company was born with social purposes and with the aim to bring the latest technology tools, such as Big Data, Business Intelligence or AI in the most accessible and simple way to local producers so that they can digitize themselves, make more informed decisions and reach more customers without having to have great technological knowledge.



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“Climate change, water scarcity and biodiversity loss, along with the continued growth of the world’s population, are among the most pressing challenges of our time and are too great to be addressed by organizations or individual groups.

To help end poverty and hunger, protect natural resources and species, and control man-made global warming, it is essential that businesses, authorities, farmers, scientists, and other members of civil society work together to define how agriculture can have a global impact to be part of the solution.

That is why Bayer is investigating innovative solutions for more sustainable crops while increasing farmers’ yields and incomes, not only fighting for environmental sustainability but also the economic and social one.

Last year we set an ambitious goal of becoming climate neutral by 2030, which shows our responsibility as a leading life sciences company in the fields of health and nutrition, and announced our commitments to meet the UN SDG’s:

- We will reduce the environmental impact of crop protection by 30 percent by 2030.
- In partnership with farmers and customers, we will work to reduce greenhouse gas emissions by 30 percent by 2030.
- We will support more than 100 million small farmers in low- and middle-income countries by improving access to agricultural knowledge, products and services.

In the Bayer Agricultural Division, we are working to achieve a food production system that is both safer, more resilient, and more respectful of protecting the planet. Farmers need help, and we are convinced that an innovative, safe and diverse set of tools can help them to produce enough food sustainably”.



Protasio Rodríguez,
DG Bayer Crop
Science Iberia

HOW DO WE COMBAT FOOD WASTE?
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07

How do we combat food waste?

Every year, one third of the food produced for human consumption is wasted in the world, which has serious economic, social and environmental consequences. For FAO, “food loss leads to the waste of resources used in production, such as land, water, energy and agricultural inputs. Producing food that is not going to be consumed involves unnecessary CO2 emissions as well as losses in the added value of the food produced”.

HOW DO WE COMBAT FOOD WASTE?
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HOW DO WE COMBAT FOOD WASTE?
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According to the Swedish startup Karma, annual CO2 emissions from food waste amount to the equivalent of 3 million cars on the road. And not only that: the impact of food waste is 4 times greater than the impact of all flights in the world combined. Globally, \$750 billion is lost each year due to food waste.

It is a complex problem that develops unevenly throughout the food chain. EU Fusions and FAO estimates indicate that 72% of food waste in the EU is produced by the domestic, service and retail sectors, while the production and processing sectors contribute the remaining 28%.

Reducing food waste could increase efficiency throughout the food chain and is a priority within the UN's Sustainable Development Goals, which estimate that food waste will be halved

by 2030. As increased food production is needed to meet the demands of a growing population in a world with limited natural resources, solutions must be found not only to produce optimal food for all, but to reduce food waste once it is produced.





In Spain, according to the latest report from the Panel on Food Waste in Spanish Homes of the Ministry of Agriculture, Fisheries and Food (MAPA), there is a trend towards stabilization, as waste only increased by one percent in 2019 in contrast to an 8.9 % increase in 2018.

The situation generated by COVID-19, which has been so devastating in many ways, has at least been positive with respect to the figures for food waste in Spain. During the lockdown, it reduced by 14% compared to the same weeks last year. Without a doubt, this data reflects the changes in consumer habits during this period in which we are at home all day, having time to cook food and consume it at home, and being able to reuse the surplus.

The economic situation of many families has worsened and therefore the tendency is to save and cook to make maximum use of the shopping basket. Although for Spaniards the environmental challenge is more linked to food packaging and not to waste, the figures tell us 8 out of 10 people throw food away. According to the MAPA, Spanish households throw away 27 million kilograms of food per week nationally. Overall, in 2019 there

were fewer households that wasted, and more unprocessed products and fewer recipes were wasted.

Fortunately, there are many projects that are working to combat food waste, especially waste that is generated in supermarkets, cafeterias and restaurants, and that which occurs in the food industry. From smart labels to the generation of new food from by-products, the development of a circular and sustainable bioeconomy in the EU offers business opportunities, related to the use of wasted food.

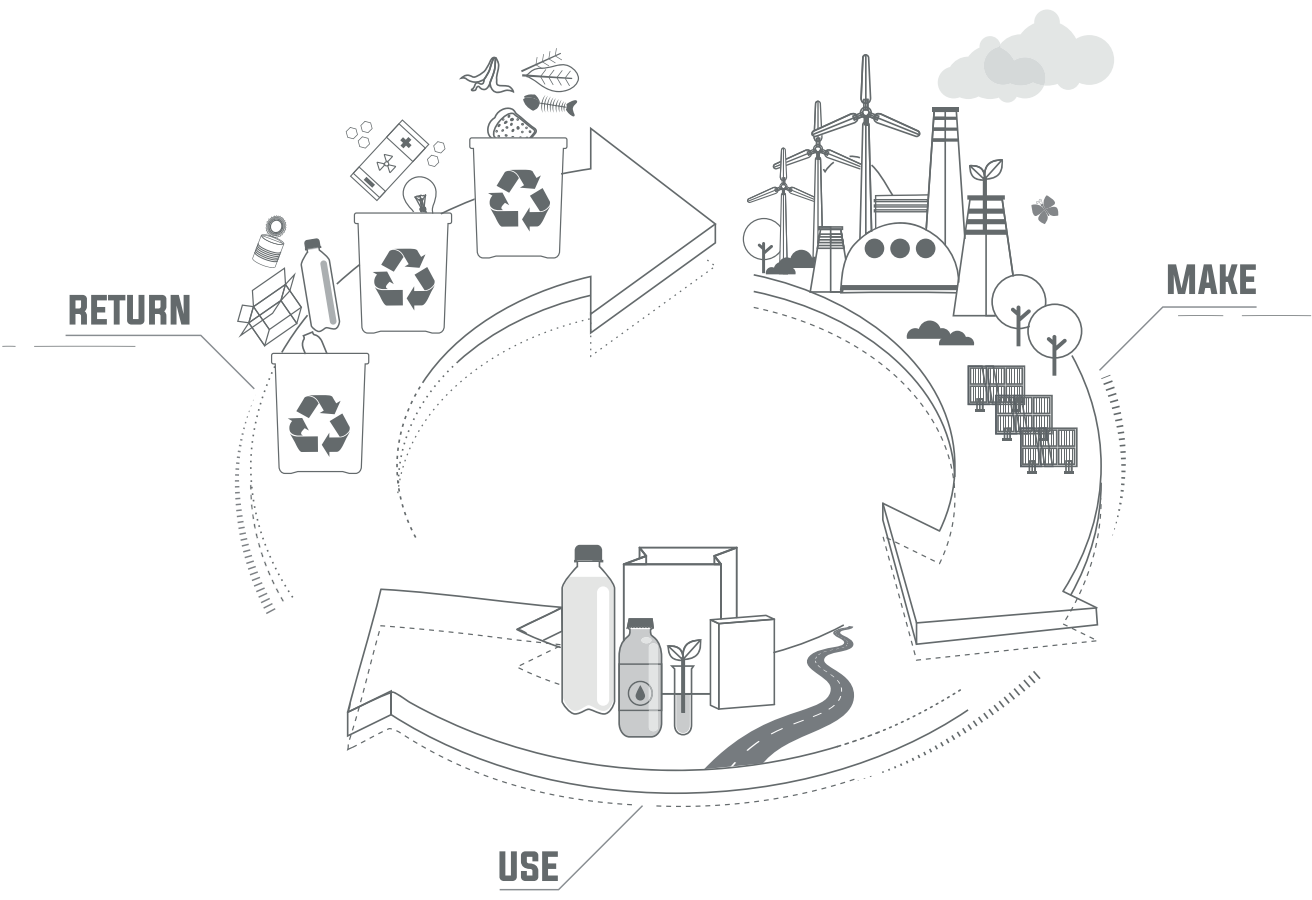
Although the trend is that as consumers we waste less and less, there is still an opportunity for innovation in this field.

We need to be more aware to reduce or end the problem of food waste, regardless of the social or economic situation we are going through. Will industry, with all its capacity to impact on the lives of consumers, help in the awareness to reduce as much as possible the waste at homes?

A committed industry

According to the study by the MAPA in collaboration with AECOC, Spanish companies are increasingly aware of the impact of food waste. More than 70% say they already have an internal strategy in this regard. Moreover, 80% have a stable collaboration agreement to donate their surplus and half of the companies surveyed say they will continue with this level of donations beyond the health emergency.

Proof also of the industry’s efforts is the recent signing of the declaration “For a planet without food waste” promoted by Too Good to Go, by 11 large companies: Danone, Unilever, Carrefour, OXFAM Intermón, Heura, Alcampo, Accor, Puratos, Sodexo, Masymas and Unibail-Rodamco-Westfield, which are joined by others like Biogran. Too Good To Go declared they will make all their resources available to companies to “drive change and help transform current practices, bringing us closer to a more efficient food system and sustainable consumption”.



Solutions from the circular economy and the revaluation of waste

Today, no one can deny the need to move from the current linear economic model to a more circular model which allows us to properly manage food waste, generate new more sustainable packaging solutions and therefore create new job opportunities. The circular economy has a lot to contribute to the food sector, and proof of this is the diversity of projects being carried out by industry, public entities and civil organizations, as well as the growing interest of investors in startups that are creating solutions from revaluation, to food packaging and smart labels.

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“At Tetra Pak, we work to protect the sustainable future of our planet and the long-term success of the food industry, as well as our own business. Our strategic objectives are to lead with low-carbon solutions for a circular economy, and to improve sustainability along the value chain, from sourcing to production to the end of life of our products. This includes minimizing emissions and waste, protecting biodiversity and ecosystems, maintaining freshwater availability, and promoting recycling and circularity. Through these objectives we contribute to SGDs 6, 7, 9, 12, 13 and 15. We know that only by working together with our customers, suppliers and other stakeholders can we lead the transformation of sustainability and drive the most significant positive change.

Our sustainability strategy is based on our commitment to a low-carbon, circular economy. And we believe that such an economy should consider not only recycling and reuse, but also the climate impact of raw materials and manufacturing, as well as impacts on biodiversity and the availability of clean water. In this regard, we can point to great achievements:

- We have already fulfilled our first commitment by launching the first paper straw in 2019. We expect to industrialize production to scale to meet global demand by 2025.
- We will incorporate a minimum of 10% recycled plastic content on average in our beverage packaging sold in Europe by 2025, provided that technically and economically suitable food-grade recycled plastics are available.
- We will use recycled plastics for secondary packaging and distribution material.

In addition, we measure our climate performance not only in our own operations, but across our entire value chain. Our climate goal for 2020 is to limit emissions across the value chain to 2010 levels despite the company’s growth, and we are making fantastic progress toward achieving this. According to our latest audited figures (in 2019), we have reduced total emissions by 11%.



Tetra Pak

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Optimize the supply chain from a circular model.

“Every year between 30% and 50% of the food produced is wasted on our planet, alarming figures that call for reflection and action to end food waste. At the same time, one in nine people in the world (around 821 million) suffer from malnutrition. What are we doing wrong?”

One of the main causes of this problem is that the current supply chain model is obsolete and inefficient, largely due to the centralization of production. Traditional factories are not flexible enough to respond to rapidly changing market demands and require large investments. At the same time, ingredients, which could be supplied locally, often have to be transported long distances from origin to production sites. This leads to high costs and consequently more expensive products, which do not reach everyone, as well as a higher environmental impact.

Food waste and the circular economy are closely related because, if we were to establish a true circular model in the management of supply chains, it would be produced more efficiently, safely and sustainably.

Blendhub has been involved in the development of food and powdered ingredients for the food industry for more than two decades. The company has evolved from production to a service platform. Blendhub's current model focuses on production location through a network of hubs, portable factories that are developed and installed, according to a unique replication model designed by Blendhub, which are transported in a 40ft container and can be

operational anywhere in the world within six months. The company currently has seven production centers in Spain, India, Mexico, Colombia and Thailand.

By optimizing the food supply chain, we help generate positive environmental and social impact. Producing closer to raw materials and end consumers creates more resilient supply chains, generates local jobs and wealth, and reduces greenhouse gas emissions by shortening transportation.

Blendhub's circular economy model is therefore twofold. First, circularity lies in the transformation of food into powder: discarded products are used in some phases of production and the life of the product is extended, thus avoiding waste. Secondly, location of production according to a replication model generates greater efficiencies and minimizes the environmental impact. Blendhub has recently been chosen by the Finnish Sitra fund, in collaboration with Deloitte, as one of the main inspiring solutions in the circular economy worldwide”.

Henrik S. Kristensen,
founder and CEO of Blendhub



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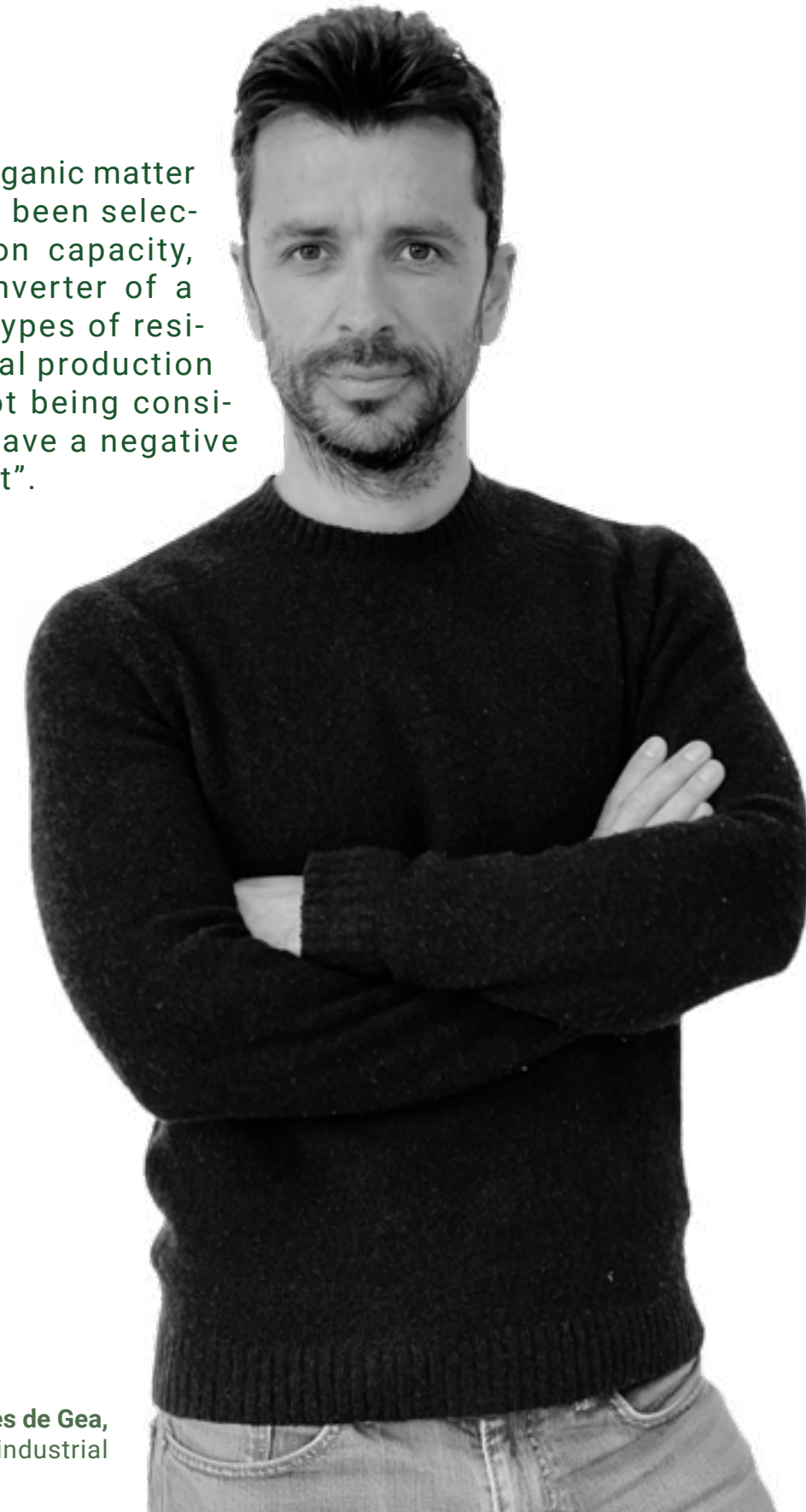
“The current consumption model implies the generation of a growing volume of waste by a growing population, which requires the implementation of strategic measures for the reduction of bio-waste produced by human activities and the damage that, to a greater or lesser extent, such bio-waste generates.

Given this problem, the trend in recent years has been to seek ways to improve the treatment of bio-waste by reducing both controlled and uncontrolled discharges, as well as the pollution resulting from some treatments, such as incineration. Within these ways, the use of bio-waste as a resource, through composting for example, stands out.

During the last decade, industrial insect breeding has aroused great interest in Europe, due to the increasingly pressing need to find new sources of high-quality animal protein. The use of insects as a source of food for animals and people implies multiple benefits both from an environmental point of view, and from a health point of view: in terms of waste treatment, insects stand out for achieving a high degree of conversion from a wide variety of organic matter sources, and as a food source they imply a lower production of greenhouse gases, as well as requiring less space than other protein sources, such as livestock.

The model chosen by Entomo AgroIndustrial to take advantage of the possibilities offered by insects consists of the industrial application of

the black soldier fly as an organic matter converter. This specie has been selected for its high conversion capacity, for being an efficient converter of a great variety of different types of residues, for allowing industrial production in high density, and for not being considered an insect that can have a negative impact on the environment”.



Diego Amores de Gea,
CEO of Entomo Agroindustrial

Sustainable and smart packaging

In recent years we have seen how in addition to the fight against waste, other initiatives are trying to reduce the use of plastic. 95% of the value of plastic containers and packaging materials is lost; most of these containers are only used once and only 14% are recycled, according to the Ellen MacArthur Foundation.

Concerns about the overuse of plastic hit a turning point at the start of the pandemic. A great social awareness generated by the knowledge that 9 million tons of plastic waste ends up in the ocean every year, seemed to be diminished by the measures taken to ensure the safety of certain foods during the COVID-19 crisis and our own safety.

Thanks to innovation, we work on solutions that, on the one hand, guarantee the safety of food, its correct conservation and convenience for consumers, and on the other, that are sustainable and do not generate a negative impact on the environment. European regulations will require that by 2030, all plastic packaging on the market is reusable or can be recycled cost-effectively. In the summer of 2021 in Spain some single-use plastic packaging will be banned such as cutlery (forks, knives, spoons, chopsticks); plates; straws and drink shakers. Now, the use of packaging with alternative materials to plastic will not only be a question of sustainability, but a legal obligation.



The topic of sustainable packaging is attractive to many researchers and startups who are creating solutions made from new materials from edible packaging based on algae and other natural elements, to platforms for the circulation and reuse of containers.



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“The management of food by-products and waste is a problem for companies, many of them being a source of high value compounds such as dietary fiber or functional compounds for food and health, with antioxidant, anti-inflammatory, anti-cancer or antimicrobial properties. The efficient treatment of these compounds in biorefineries allows the obtaining of high value bioactive compounds, together with renewable energy, biomass or fertilizers. Its biotechnological processing, with different bacteria, also allows the production of bioplastics that can be used in food packaging.

The development of biodegradable packaging materials, with bioplastics obtained from these renewable sources, allows an increase in the shelf life of food, reducing waste. These materials can replace, at least partially, conventional synthetic plastics, thus reducing their environmental impact on marine and terrestrial ecosystems. Although the availability of bioplastics in the market is limited, the developments made allow us to improve the conservation of food, being able to be incorporated to the trash can for its new integration in the cycle of the organic matter and production of biomass. The incorporation of active compounds (antioxidants or antimicrobials) into the packaging material improves the functionality of the package to extend the life of food, enhancing its conservation. Many of these active compounds can be obtained from food by-products or waste by means of efficient extraction methods within the framework of biorefineries.

From these developments, framed in the concept of circular economy, we contribute to the achievement of different Sustainable Development Goals (SGDs): Zero Hunger, Health and Welfare, Responsible Production and Consumption, Action for the Climate, Underwater Life, Life of Terrestrial Ecosystems. The commitment of the public and private sector to these studies, and their translation to the market, must be clear and firm because they constitute an effective tool to achieve the maximum objective: to preserve the planet and to adequately feed the population”.

Amparo Chiralt,
Institute of Food Engineering for Development.
Universidad Politécnica de Valencia



BEST PRACTICES

Too Good to Go

The startup has launched the “Waste Warrior Brands” initiative, an open community of committed brands that offer the strength of their businesses to combat food waste and its consequences while making a positive impact on the planet.

LeanPath

Leanpath invented a tracking and analyzing food waste system to help cooks understand what goes into their bin. They have just introduced Impact Suite, a set of tools that goes beyond tracking waste to guide kitchens through specific actions to reduce their greatest food waste problems.

Karma

It is an application that allows food retailers to sell surplus food to consumers for half the price. Together with Electrolux they have developed a refrigerator that speeds up storage and collection, eliminating the need for more employees to handle customer transactions.

SoundSafe

Innovative solution to reduce food waste and increase the shelf life of fresh produce after harvest using ultrasonic and microwave radiation.

Whywaste

The Swedish startup has a system for analyzing and managing the expiration date that helps stores keep track of products that will soon expire. It also has a food tracker on the counters to limit the amount of food that ends up as waste.

Feltwood

They develop technologies to produce ecological industrial materials, 100% vegetable fibers, from agricultural residues. A real alternative to plastic, wood and agglomerates with multiple applications. These materials are completely biodegradable, recyclable and compostable.

Naifactory Lab

This startup has created Reolivar: they use the olive stone as a raw material to develop biomaterials and their subsequent application to product design. Their pieces highlight the wide range of formal, chromatic and textural possibilities offered by these materials.

Vicky Foods

Vicky Foods is leading the shift to biodegradable packaging for all its Dulcesol brand products. It is estimated that this initiative will affect nearly 150 million packages of all its bread and pastry products and reduce the brand’s use of conventional plastic by 1,200 tons annually.

Bio2Coat

It develops and produces edible food coatings from natural sources that extends the life of food.

Crover

A small robotic device that can “swim” between bulk solids such as grain and seeds, constantly monitoring their condition while in storage.

Free Waste

Food waste processors convert organic waste into compost tea, which is easy to apply and has a high nutrient content.

Tsenso

B2B cloud solution that evaluates food freshness in real time based on an index called the “Freshness Index”, which analyzes the temperatures at which the product was stored and transported throughout the supply chain, from farm to fork.

Lyspackaging

The startup transforms bagasse, the dry fibrous residue that remains after extracting the juice from the sugar cane, into granules through a patented process. They obtain a material with manufacturing and use properties like plastic, which is completely vegetable, biodegradable and compostable.

Inuru

Startup ink technology prints organic light-emitting diodes (OLED) on packaging and marketing materials. The technology was used by Coca-Cola Singapore for a Star Wars campaign: when a consumer picked up a bottle, the character’s lightsaber would light up. This helped make the bottles stand out and created a memorable experience for the client.

BEST PRACTICES

Upprinting Food

They create valuable food concepts from food waste with 3D food printing technology. They are focusing on collaborations with restaurants to help them reduce their food waste streams and create a unique dining experience.

Oiomo

Startup that has developed a material based on algae, sugars and natural vegetable oils that is not harmful to marine life and is adapted to the machinery that companies already have to produce normal plastics, so companies would not have to invest in new machinery to use it.

Carlsberg

Carlsberg recently launched what they claim is the world's first paper beer bottle made from sustainable, recyclable wood fibers. The project has taken 5 years to complete, but will not yet be seen in stores, as it is still a functional prototype.

TIPA

TIPA packaging is as transparent, durable and waterproof as conventional plastic packaging with the difference that it is completely compostable. TIPA offers certified food grade packaging for fresh, dry, refrigerated, baked and frozen products.

Sorbos

SORBOS reinvents the way we consume drinks: they have developed the first 100% biodegradable and environmentally friendly edible straw. They have 8 flavors to choose from.

BlakBear

The company that created a smart label that warns if the food is in bad condition is working on a system called HoneyBox (a tupper) that incorporates the freshness sensor and then communicates with an application through Bluetooth. The device will send reminders and act as a countdown clock if the food is edible.

Loliware

This American company makes edible cups with or without flavors such as yuzu, matcha green tea or vanilla. Their packaging is made with organic algae and sweeteners and the flavor and color is derived from fruits and vegetables.

Polynatural

They have created Shel-Life: a 100% natural (plant-based) emulsion made with natural extracts, lipids and vegetable polymers that form a coating on the fruit. Its main function is to reduce fruit waste by controlling dehydration and the growth of microorganisms.

VEnvirotech

Biotechnology startup dedicated to the transformation of organic waste into bioplastics (PHA) that are characterized by being produced by bacteria, biodegradable in the environment and compatible with the human body. VEnvirotech achieves this thanks to its own technology which is installed wherever waste is generated, and which allows PHA bioplastics to be obtained.

ColorSensing

A spin-off of the University of Barcelona, their first product is a revolutionary intelligent packaging solution (a SAAS) to reduce waste of fresh packaged food and ensure quality and safety in this sector.

Mimica

Its mission is to radically reduce food waste caused by poorly timed expiration dates. Its first product, Mimica Touch, which has received several design awards, is a temperature-sensitive indicator label for food freshness.



Innovating Alimentary Machines

The young inventor Maitane Alonso has developed a new method of preserving food by means of packaging with treated air. Her technology increases food durability and drastically reduces potential waste. On the other hand, it minimizes the possible health conditions derived from the poor conservation of food since this technology significantly reduces the presence of pathogens and microorganisms. This system is cheaper, faster and more sustainable than all the existing supply in the market.



FEATURED BEST PRACTISES

MOA FOODTECH

MOA was born with the aim of solving two of the biggest problems our society is facing: satisfying the growing demand for protein by fighting climate change. MOA transforms the waste and by-products of the food industry into an alternative source of protein. Its biotechnological process produces food with high nutritional value in an efficient and sustainable way. It is free of antibiotics and pesticides, and consumes minimal water, energy and land.



FEATURED BEST PRACTISES





OSCILLUM

Oscillum develops sensors for the agri-food industry based on the application of biotechnological methods. Currently, they are developing intelligent labels that can indicate the state of fresh food by a simple change of color, going from yellow (optimal state of the product) to blue (not recommended for consumption), showing the freshness, quality and safety of food both inside and outside the package.

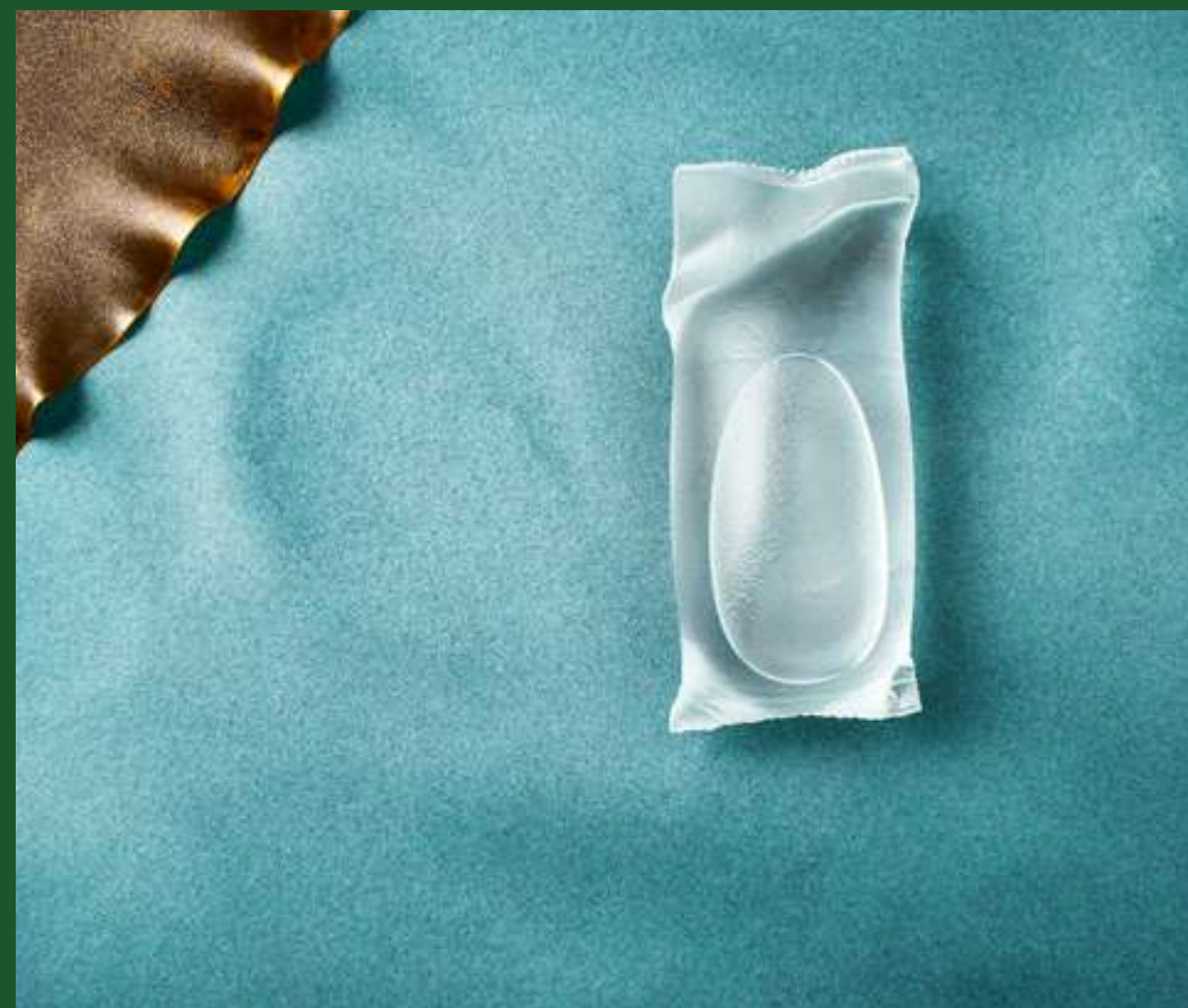
With this label, Oscillum aims to significantly reduce the waste of food that occurs both at home and in supermarkets, always maintaining consumer safety. The labels are 100% biodegradable.



FEATURED BEST PRACTISES

Notpla

Notpla is revolutionizing the world of packaging through Ooho, its product created from algae and plants that is edible and degrades within 4 to 6 weeks. Notpla collaborates with companies like Just Eat, for whom it has created edible sachets for its sauces. In 2019 they created with The Glenlivet a limited-edition whisky cocktail in Ooho capsules, which went viral.



FEATURED BEST PRACTISES



AGROSINGULARITY

FTALKS'20 AWARD WINNER - SUSTAINABILITY CATEGORY

Agrosingularity is an environmental impact company that has created a solution to mitigate the impact of food loss on production, specifically fruit and vegetables. Fruit and vegetables represent 45% of the total food that is lost annually in Spain, and focusing on the production, 1.3M of TN are originated. Agrosingularity transforms these valuable fresh foods into powdered ingredients that can be reintroduced into the food production chain, providing functionalities of color, flavor, fiber and protein, as its main uses.

To do this, the company operates in HUB mode, locating the production close to the origin of the shrinkage. It currently operates in Murcia and plans to scale up its model, with the launch of AsPlatform, a unique solution that combines software (for quality control, food safety and traceability) and hardware, with the development of its own production units, totally mobile with the capacity to operate in any environment, either “fixed” or totally “mobile”. In this way, the company expects to be able to expand its model in the next three years, creating a global network of hubs and making the way we feed ourselves more sustainable.





Towards a society without plastic pollution

“The European Union is committed to taking a leading role in implementing sustainable development policies, both within the Union and by supporting their implementation in developing countries.

To this end, in 2015 the European Commission approved the Action Plan for the Circular Economy, with the aim of moving from a linear economy (based on extracting raw materials, manufacturing products and discarding them) to a circular model that aims to keep the value of products, materials and resources in the economy as long as possible.

The content of this Plan, whose initial version allowed a review of the EU waste legislation, is in line with the objectives of the United Nations Agenda 2030 for Sustainable Development and the Paris Agreement on climate change and has been confirmed with the approval of the European Green Deal in 2019 and the new Action Plan for the Circular Economy last March.

The move towards this circular economy led the EU to identify plastic as a key element in the volume of tonnes produced per year to meet demand, mainly from the packaging sector, and in its negative impact on the environment.

Therefore, to comply with the set development strategy, it has been essential to establish policies to prevent the generation of plastic waste and increase its recycling, as well as to promote new designs, production and consumption systems, with the aim of making all plastic packaging reusable or recyclable in a cost-effective way by 2030.

This has led the packaging sector to opt for solutions based on eco-design, taking into account sustainability criteria in their manufacture, reducing the weight of the containers, extending their life cycle and facilitating their recycling, and researching, in turn, the use of alternative packaging, such as bioplastics and bio-packaging from vegetable waste.

Although this has meant an important transformation for this sector, we cannot forget that the goal is not to reduce waste, but to achieve “zero waste”, even eliminating wrappings that sometimes only have an aesthetic purpose.

Under this premise, the Draft Law on Waste and Contaminated Soils, which transposes into Spanish law Directive (EU) 2018/851 of 30 May, of the European Parliament and Council, which in turn amends Directive 2008/98/EC of 19 November on waste, proposes the creation of an excise duty on non-reusable plastic packaging.

This tax, of an indirect nature, will be levied on the manufacture, import or intra-community acquisition of non-reusable plastic products that serve to contain products or to wrap goods or food products to be introduced into the Spanish market. It is expected to come into force on 1 July 2021.

Those obliged to pay will be those who carry out these functions of manufacture, import, intra-community acquisition or irregular introduction of packaging in the territory of application, setting a tax rate of 0.45 euros/kg, as well as exemptions and deductions to be used.

While we cannot ignore that COVID-19 is having a negative effect on reducing the use of plastic, since the need to implement individual protection measures to prevent its spread has caused an increase in production and demand for the product, the truth is that the efforts of governments, employers and society are giving increasingly hopeful results in reducing plastic pollution”.

Sofía Cabedo,
Senior Lawyer in the Public Law
Department of BROSETA





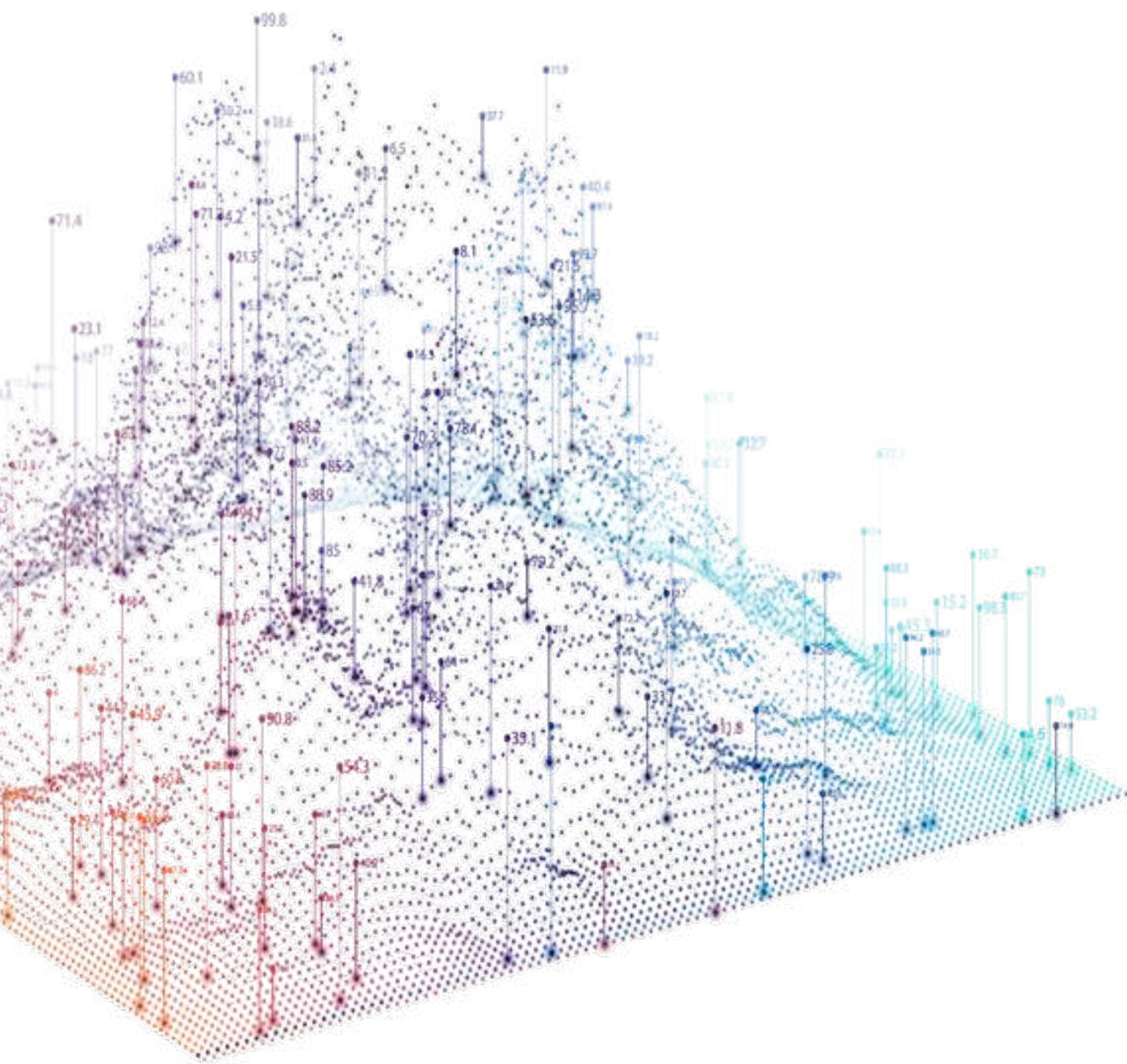
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08

Digitization, artificial intelligence and robotization

Digitization in the food industry has had a radical effect on production and distribution. In a world dominated by smart technology, Internet of Things devices and automation, it should not be surprising that companies are adopting new technologies to improve their processes and competitiveness.

DIGITALIZATION, ARTIFICIAL
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While distribution is seeing significant changes, the overall digital transformation in the food and beverage industry is changing rapidly, the environment through several technologies being implemented by companies and organizations.

Today, companies tend to sit on mountains of data without understanding how they can fully utilize it to improve their operations. Considering recent events, many organizations have found themselves in the need to catch up, trying to

implement makeshift cloud solutions to make up for lost ground, while their organizations see dramatic transformations and challenges in their supply chains

87% of organizations have low analytical and business intelligence maturity, which means that data is not being used.

Food and beverage companies that are using solutions such as ERP to help them identify previously “hidden” business opportunities are managing to reduce the products and features that analysis is showing are not driving business well.

It is difficult to discuss where digitization is heading in the food industry without mentioning automation. Many of the technology implementations mentioned benefit in one way or another from some type of automation

The latest report published by Salesforce reveals that seven out of ten Spanish companies have accelerated their digitalization in recent months.

According to the most recent data (up to June 2020) from the market consultancy firm The CMO Survey, Spanish companies increased their spending on digital marketing by 12.6%.

As for traceability, current technology provides transactional mechanisms in which each element of the value chain is recorded, with the disadvantage of inefficiency and the difficulty of maintaining consistency between them. Therefore, the application of Blockchain technology is allowing to optimize costs and improve the transparency of the entire value chain. One of the advances we will see in this sector, will be that the data will be accessible to consumers, to strengthen their confidence in the products. An example of application is the Traceable startup. Thanks to blockchain platforms, companies in the supply chain can share information, thus creating a single record with the entire history of a product. In this way the company has instant access to all the information in the chain.



Artificial intelligence is making great progress in its applications for the food sector. One example is the use of chatbots combined with artificial intelligence by the company IntelligentX. They use an algorithm called ABI that analyzes the ratings received and then converts them into suggestions for improving the next batch of beer.

BEST PRACTICES

Sustainable Shrimp Partnership

This startup, which is part of the IBM Food Trust ecosystem, will help provide traceability for shrimp from farm to table. The platform will use blockchain technology to provide greater responsibility and transparency to customers at each point of production and the path of the Ecuadorian premium shrimp, until it reaches the consumer.

Thank my farmer

This startup relies on IBM's blockchain technology giving traceability to the coffee. The main task of the application is to allow consumers to verify the path of the coffee they are consuming to verify its origin, quality and even to be able to support the coffee grower.

Siali

The startup has developed an artificial vision tool that offers solutions based on artificial intelligence aimed at the industry, with the idea that processes that until now involved visual inspection can be automated.



We are witnessing how robots have come to play a role in every step of the food supply chain, from farming to manufacturing, packaging and delivery. In fact, nine out of 10 food processing and packaging companies are using robots to improve food safety, reducing worker injuries and increasing efficiency, according to a recent study by the Packaging Machinery Manufacturers Institute.

In addition to automating repetitive tasks, in the hospitality industry, for example, we are seeing how robots are cooking like a Michelin star chef. This is thanks to artificial intelligence, they can track products and their demand to adjust production to this demand.

We also see more and more uses for 3D printers. They are currently used to produce certain objects, but some researchers have begun to explore how to develop customized meal solutions using this technology, so that older people, for example, can consume some products that they cannot enjoy in the traditional way. 3D printing allows you to deconstruct food, change its nutritional content, reconstruct it through the printing and present it in the desired form, so that it is more familiar for them.

BEST PRACTICES

Analytic Flavor System

This American company is the creator of the Gastrograph app, based on artificial intelligence, which is responsible for collecting data from individual users, with the aim of providing data to develop products in the food industry.

Chemometric Brain

Chemometric Brain is a tool designed by specialists in quality control, whose purpose has been to create a software or digital platform that allows the customer to control, in a precise, fast and replicable way, everything that is received and produced in their facilities, always under the most demanding standards of quality and control of food safety.

The Sifter

It is an online database that aims to record the universal history of cooking created by Barbara K. Wheaton, an 89-year-old woman who has dedicated more than half her life to building it.

Foodpairing

This website uses scientific techniques such as data analysis and machine learning to create algorithms that calculate the compatibility of food and beverages.

The digitalization of the food sector is just beginning and it will continue having a great impact on the system in the coming decades.



BEST PRACTICES

Food Innovation and Resource Center
It was born in 2007 as a joint initiative between Singapore Polytechnic and the government agency Enterprise Singapore, to provide food companies with technical expertise in the development of new products and processes, including packaging, shelf-life assessment, market testing and automation.

Anrich3D
This spin-off from Nanyang Technological University is developing a personalized nutrition project based on the nutritional preferences of people of any age. Users can obtain nutritional information through an application to convert them into ingredient requirements and shape preferences. The project seeks its target consumers among people who want to take care of what they eat and also focus on the production of food for children.

Chowbotics
This Californian startup has created Sally 2.0, a fresh salad dispensing robot for retail, thus offering contact-free alternatives to their ready-to-eat food services.



BEST PRACTICES

Macco Robotics
They develop solutions for the hospitality sector, such as robots that take care of the disinfection of spaces or that help sanitary control. In addition, they are designing smoke-noise robots to work with food and prepare hamburgers, pizzas, pokes, among other products.

Miso Robotics & White Castle
The oldest hamburger chain in the USA, White Castle is collaborating with the startup Miso Robotics to incorporate Flippy, its automated kitchen assistant that will be in charge of cooking hamburgers and frying potatoes.



Journey Foods
It is a machine learning software platform for food companies. They build business technology that improves monitoring and product development for CPG companies, ingredient suppliers and manufacturers. With a focus on saving companies money and time, Journey Foods' tools accelerate innovation.



NotCo

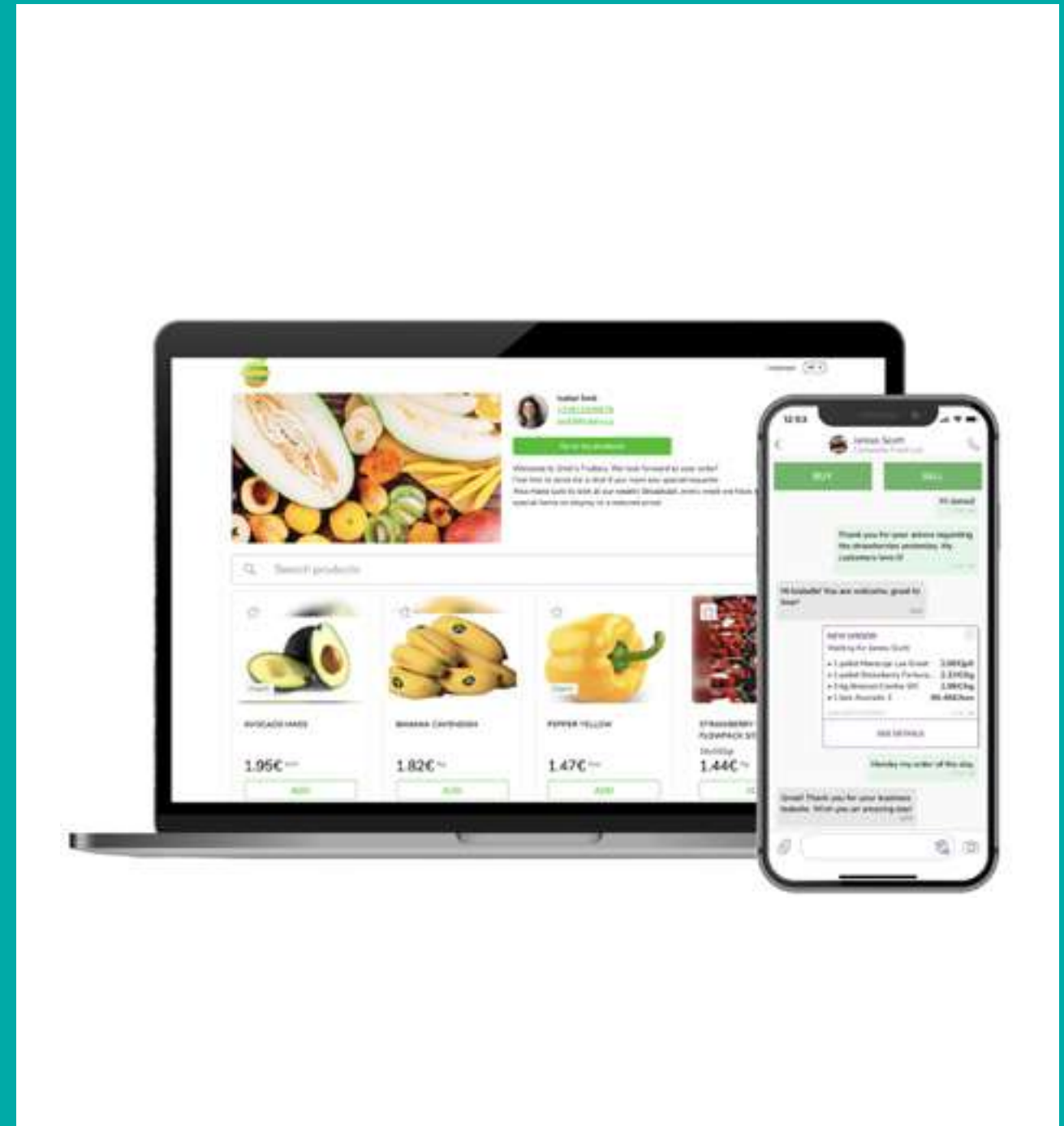
NotCo is revolutionizing the food industry, developing and marketing healthy and tasty plant foods, at an affordable price and produced with less impact on the environment. Recipes are made by an algorithm called Giuseppe that searches a database of plants - to identify which foods should be combined, and in what proportions - to produce the desired taste and texture of the food being substituted. The algorithm finds unusual links between plants that it has previously classified at the molecular, nutritional, sensory and physicochemical levels. The creations suggested by the algorithm are supported by a team of scientists and cooks who perfect the recipes.

FEATURED BEST PRACTICES



Consentio

It is an innovative digital platform for B2B commerce that leverages technology to streamline business processes. Creating a unique space, it provides users with immediate communication with a network of sellers and buyers, instant price updates and a personalized showroom, all from a single platform.



FEATURED BEST PRACTICES





AINIA & Vicky Foods

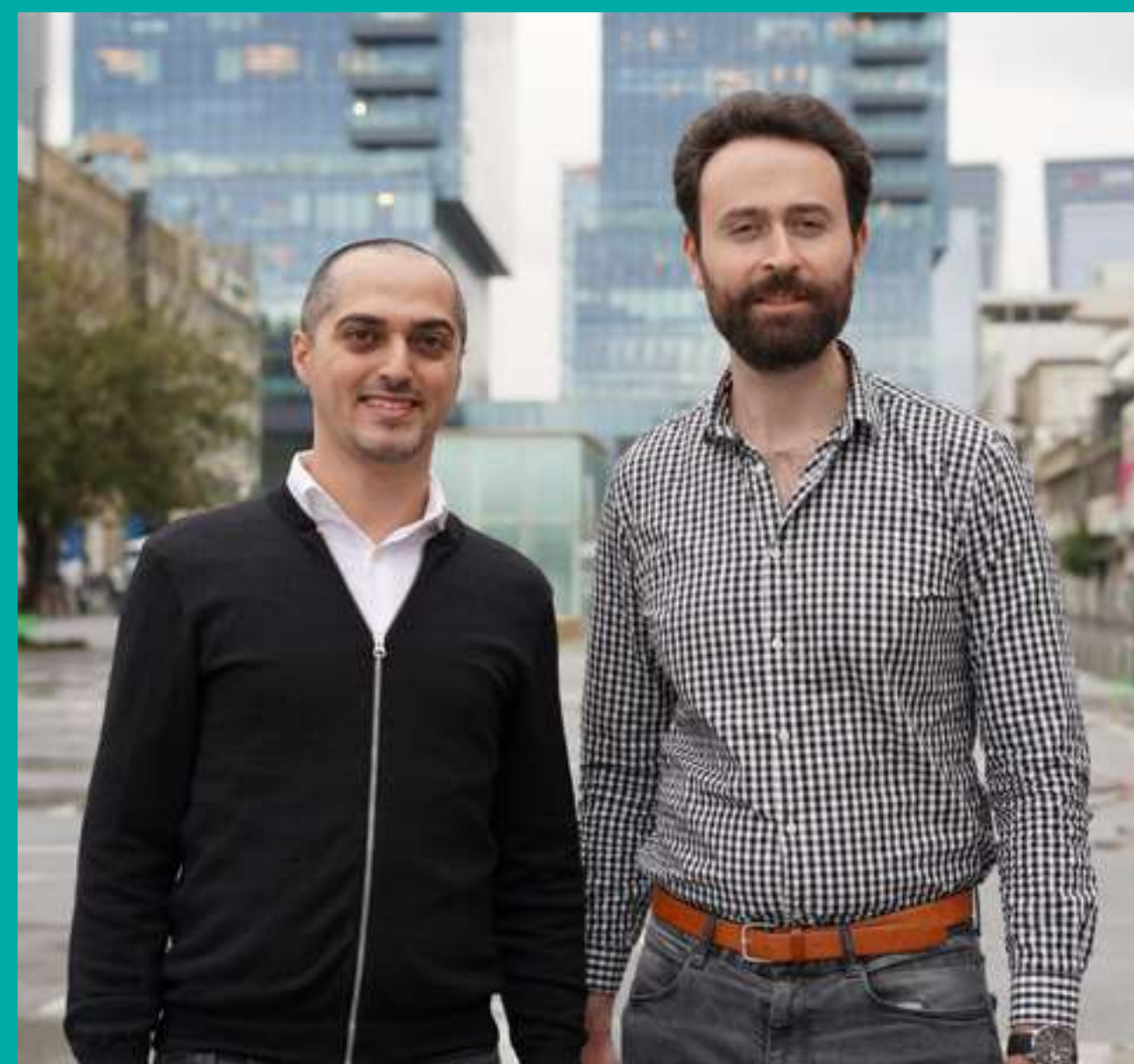
These two companies have collaborated to apply artificial intelligence technologies to the process of making different varieties of bread. These 4.0 technologies used in the framework of the SMARTBAKE project, allow the development of predictive systems for a better supervision and control of the resources and production processes of bakery and pastry as a better use of raw materials, a homogeneous product quality or the reduction of product losses.



CASOS DE ÉXITO DESTACADOS

TasteWise

TasteWise combines the largest data set in food intelligence with patented machine learning algorithms to analyze and extract information and predict consumer behavior. The result is a platform that provides rapid access to the information needed to make smart decisions for food brands and companies.



CASOS DE ÉXITO DESTACADOS



“

“During the last 10 years, there are many technological-digital solutions that have substantially changed each part of the value chain of companies in the agri-food sector.

The use of drones or artificial vision applied to precision agriculture, robotics and artificial intelligence in production processes, as well as to optimize logistics and distribution operations, the digitalization of points of sale and many other solutions that make the agri-food tech ecosystem very diverse and dynamic. It is not only a question of digitalization or the use of a portfolio of technological solutions, but many companies are already moving into new markets, in the case of B2B models, creating new channels to address the final consumer, in search of new market segments and have a direct relationship with consumers, or in B2C companies, generating B2B value proposals.

It is more important than ever for companies to be close to consumers and understand how they interact with their products and brand, through which channels they prefer to be able to generate better experiences at the time of consumption, and especially in a new decade where the consumer is more informed and global.

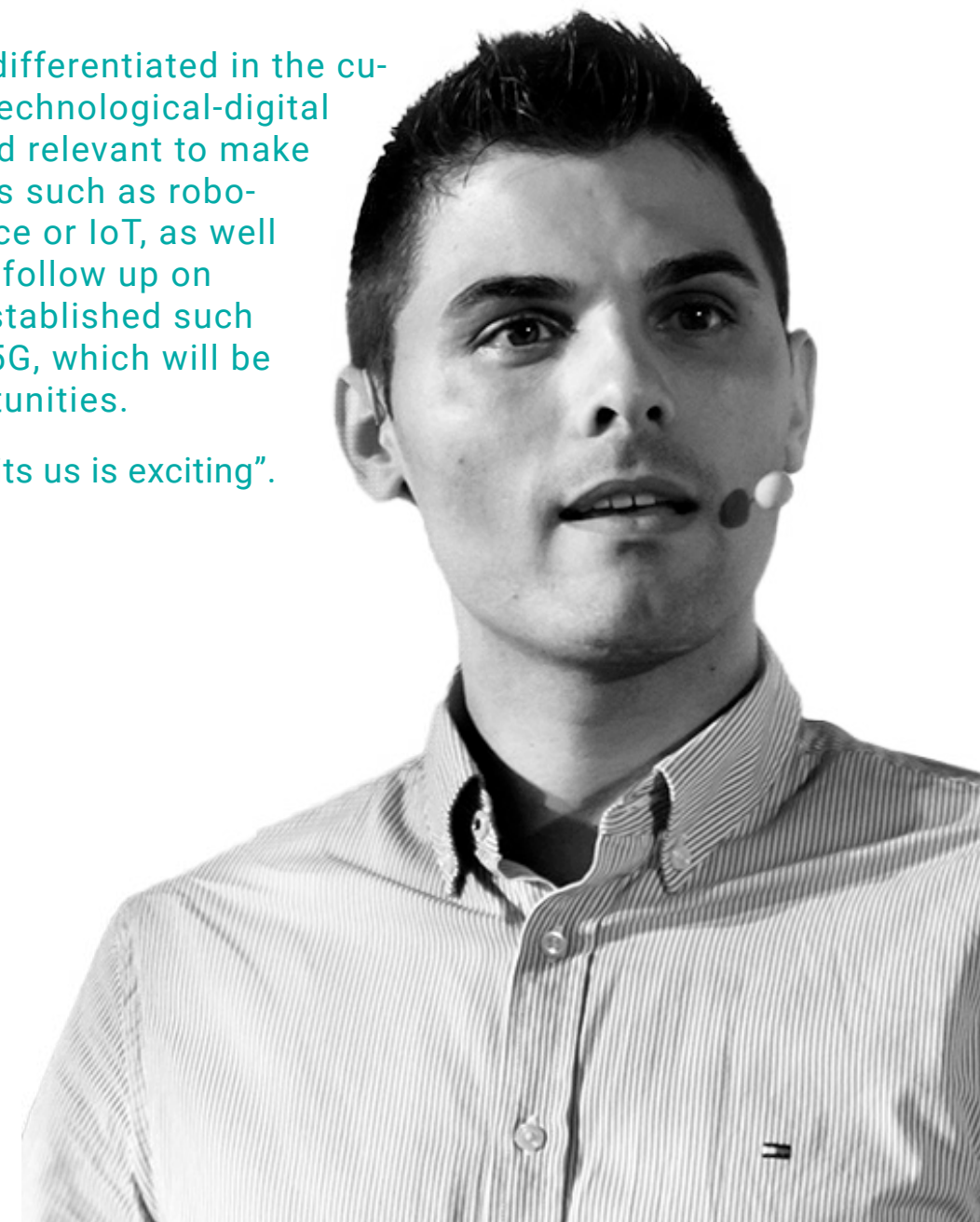
In the next few years, we are going to see a lot of companies betting more on digitalization in relation to their clients and consumers, and we will see a growth in the number of solutions offered by startups. More and more innovation initiatives are growing in the market to solve challenges or capture opportunities in a market as alive as this one, alternative proteins or personalized nutrition.

In Spain we have a relevant position. According to data from the latest report of ‘Agri-food Ecosystem in Europe Startups’, elaborated by the World Business Angels Investment Forum (WBAF) and the European Foundation for Innovation and Application of Technology (INTEC), Europe is the second place in the world with more volume of investment in agri-food tech, in the same time Spain is in fourth position within Europe.

To be competitive and differentiated in the current market, having a technological-digital strategy is essential and relevant to make use of new technologies such as robotics, artificial intelligence or IoT, as well as to pay attention and follow up on others that are being established such as Edge Computing or 5G, which will be the basis of new opportunities.

The near future that awaits us is exciting”.

Gerard Gracia.
Head of Digital Business
Innovation Estrella Galicia





SUSTAINABLE LOGISTICS
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SUSTAINABLE LOGISTICS

09

Sustainable logistics and the last mile challenge

The trend to seek out increasingly personalized and locally sourced products, through different channels, and the need to acquire them quickly, has laid the foundations of the current supply chain model, and for this reason, logistics must continuously adapt and innovate, reducing the environmental impact of its activity

& THE LAST MILE CHALLENGE
& THE LAST MILE CHALLENGE
& THE LAST MILE CHALLENGE
& THE LAST MILE CHALLENGE



The reduction of CO2 emissions, route optimization, automation, traceability, omnichannel clients and the last mile delivery are just some of the challenges faced by one of the most important links in the chain: logistics.

“While there has generally been an adequate food supply, this pandemic has set out numerous challenges, including logistical disruptions to supply chains, labor shortages, loss of certain markets, and changes in consumption habits, all of which impact the functioning of food systems”.

European Green Deal,
“From Farm to Fork” Strategy

In addition to a consumer who seeks speed, convenience, personalization and local products, there is an environmental awareness that makes sustainability a decision criterion when purchasing a certain product or service and becoming loyal to a brand. It is not only important to know how a product was made, but consumers also want to know how it is packaged, how it is transported and the environmental footprint it generates.

This is why sustainability is key in the logistics strategies of the food industry. It is no longer possible to understand efficiency without taking this factor into account. In addition to environmental imperatives, new consumer habits make it necessary to adapt e-commerce, which has increased in Spain, according to the Global E-commerce 2020 report by eMarketer, by up to 20% in 2020. This increase has stressed the supply chains that were not fully prepared for this peak in widespread demand that increased by the crisis of COVID-19.

BEST PRACTICES

El Corte Inglés

El Corte Inglés has begun to offer a complete logistics system to brands that sell from its marketplace, taking advantage of all its capabilities. Like Amazon does, they take care of the entire process, from the showcase where the products are displayed, to storage, delivery and customer service.

Alibaba

Alibaba has introduced an autonomous logistics robot aimed at reducing the cost of last mile deliveries by boosting automated deliveries. This robot can deliver up to 500 packages per day to a designated community or campus and can carry 50 packages at a time. It can also cover 100 km with a single charge.

Amazon Prime Air

The U.S. Federal Aviation Administration (FAA) has approved Prime Air, Amazon’s system for safely delivering packages to customers in 30 minutes or less using drones. The packages, which cannot exceed 2.3 kg, will be loaded onto a self-contained electric drone with a registered route that will carry the order to the customer, guided by GPS and flying about 120 meters above the ground.

To meet these needs, sustainable logistics relies on continued investment in technology that can help automate production and delivery processes. We see more and more autonomous deliveries, fresh vending concepts and other new technologies that can reduce the cost of food production and distribution while ensuring food safety.

For example, the Geever last mile home delivery startup bases its strategy on proximity, having a sorting center every 750 meters to speed up deliveries. Its distribution centers are in parking spaces or storage rooms. On the other hand, for companies like Glovo, managing peak demand at specific times is

vital, and for this they use a fleet management and dark store management algorithm, in addition to data-science and inventory prediction technology.

The investment in last mile projects is growing thanks to the increase of this market. A boom can be observed in this type of startups that to stand out and succeed will have to generate a disruption and not only make improvements in digitalization of models already seen.

Direct to Consumer (D2C)

Although it is expected that when the COVID-19 crisis passes, consumers will return to the behaviors of previous times, direct to consumer sale is an alternative that has come to stay. These platforms will be complementary to the existing channels since we are increasingly talking about an omnichannel customer. And to continue to satisfy these customers, it is necessary to adapt. Beyond Meat has opened an e-commerce to sell directly to its public, after seeing the

massive closure of restaurants in the USA and to explore a more direct way to reach their consumers, launch offers and obtain feedback. Deliveries are made through UPS and its zero-emission fleet.

Large companies such as Nestlé, Heinz and PepsiCo also opened direct channels to their consumers and what has been demonstrated is that D2C e-commerce is not only for startups that do not



want retail sales and large expenses on a general level, but it is for all brands that seek preference, loyalty and recurring sales through a direct relationship. And above all, data of your consumers, their preferences and needs.

Quick Service Restaurants (QSR)

The pandemic has also meant that the restaurant industry has had to adapt and, in many cases, reinvent itself. And we are not just talking about food service, but about the fact that restaurants found food delivery to be the best option to continue offering their experiences.

In this sense, we see how new formats of virtual restaurants or in the cloud, (cloud restaurants), which do not open their doors to the public, but only prepare their dishes to be delivered either through kiosks or pop-ups, are emerging and growing at an unstoppable rate; for example, in the Latin American market the startup MUY has increased its model by 200% and is already present in Mexico and Brazil.

According to Jihad El Eit, founder of Kaykroo startup, the pandemic has contributed to increased consumer demand for delivery, but the transition both globally and regionally had begun much earlier. In an interview with SME10, he believes that investors are actively looking at this sector because of the high level of scalability it offers, as, according to him, it is the only business model within the F&B industry that can support this growth.

BEST PRACTICES

Freshket

The platform helps Thailand's fragmented agricultural supply chain by bringing together processing centers and suppliers and connecting them directly to farmers. Freshket tells its network how much produce they will need to provide daily, so they can plan their supply chains.

AllreadMLT

It has created an algorithm that allows any camera device to automatically find and process any text, symbol, or value code (number of a container of goods, license plates, symbols of dangerous products...) found in the images with which a supply chain works.

Scoobic Urban Mobility

Spanish startup that develops totally electric vehicles and, therefore, zero emissions that combine the agility and speed of a motorcycle with the possibility of charging a van and that, in addition, clean the air of cities through an aspiration system that filters carbon particles and emits clean air.

The rise of local product platforms

“Now more than ever, people are looking for value in food. Even as societies become more urbanized, they want to feel closer to their food. They want it to be fresh, less processed and from sustainable sources. In addition, calls for shorter supply chains have intensified during the current pandemic. Consumers must be empowered to choose sustainable food, and all actors in the food chain must see this as both a responsibility and an opportunity for them”.

European Green Deal,
“From Farm to Fork” Strategy

Another consequence of the pandemic has been the increased demand on direct sales platforms for local or proximity products. Initiatives such as La Colmena que dice Sí increased their sales by 300% during the lockdown period. This growth is due in part to that widespread feeling of support among society for local initiatives during the difficult time we are going through.

Although the tendency to value the local production is not new and in many countries the locavore movement (those consumers who eat only food that is grown or produced in their locality or in their proximity) is spreading. In the wake of the pandemic we have seen an increase in the emergence of similar platforms in several cities and towns in Spain. For example, 20% of the startups that applied for the Ftalks’20 Awards were direct sales platforms for local products.

However, distribution remains one of the most important challenges for these projects. When the volume of orders

increases, working under sustainable transport criteria and adding the restrictions of COVID-19, shipping becomes more expensive, directly impacting the consumer. Not to mention the obstacles inherent in distribution in certain areas of city centers that are more difficult to access.

We see how more and more formulas like click & collect or ship from store are implemented, while new logistics centers, order picking hubs and last mile delivery services and dark stores are emerging.



“Last mile delivery is the most expensive and inefficient part of the entire supply chain”.

Jeff Zhang,
President of Alibaba Cloud Intelligence



BEST PRACTICES

KaiosID
Its invisible technology is completely integrated into the design of the package or label and can be easily scanned and identified with a smartphone. Thanks to individual product identification, information such as batch, origin/production date, destination market, field reports, or suspicious activity alerts, for example, can be accessed.

Revoolt
The Madrid-based startup unites sustainable and connected mobility with a cloud platform to offer the first all-in-one solution focused on last mile deliveries. Most of its fleet is zero emissions, helping to improve air quality in cities.

Fliity
German platform that connects food companies with transporters to enable optimal capacity utilization, greater flexibility and transparency. They ensure transparency and performance by providing access to panels with tracking of all key KPI.

“

More local, more sustainable and familiar

“Why do people know the neighborhood shoemaker or the bus driver, but don’t know who has grown their vegetables? This question was posed to us by a producer, talking about kilometer foods, those foods that travel long distances before reaching our tables. An example of this is it is common to find apples from distant countries in supermarkets, while being produced in our country. The result: these travelling apples consume 4 times more energy with transport being the determining factor, than a local apple. But there is another question: we will never know the producer behind it?

For us, the future of food can be viewed through this premise: “more local, more sustainable and familiar”. In La Colmena Que Dice Sí! the average distance of the products from the field to the “Colmena” (collect points) is 50 km. This average includes what we call “Special Guests”, producers who sell their product at a greater distance than usual because the food is not produced in the region, and instead is part of the basic basket. In Madrid, for example, special sales of fish and seafood from artisanal fisheries in Galicia are accepted to complement the offer, as well as more variety of fruit such as oranges. But they are all part of the network of 600 reliable producers and processors of the “Colmenas”, small projects with name and surname, which you can meet.

The world of food has long been sowing change. And it is accelerating with the pandemic.

‘What we must ask ourselves is not whether local and organic products are expensive, but why conventional products are so cheap?’

We end with another reflection from another producer so that, together, we can change the chip of our form of consumption”.

La Colmena que Dice Sí.





TRUCKSTERS

Spanish startup that optimizes the world of logistics and long-distance transport of goods with an innovative relay system. Based on Artificial Intelligence and Big Data, it allows drivers to sleep at home, since a professional drives 4.5 hours and exchanges with another truck to drive the goods in the opposite direction for another 4.5 hours. This reduces the time professionals spend away from home thanks to the relays, and improves the transport service, being faster and more cost efficient than traditional services.



KAYKROO

The startup operating in the UAE region has created a network of 15 smart kitchens and brands focused on delivery and take-away, including kiosks and pop-ups. Kaykroo's broad geographic reach, combined with data-based technology that uses AI and machine learning to increase speed and efficiency, gives its customers the opportunity for a personalized experience, without compromising quality, taste, or freshness.





NURO

Is one of the main companies of autonomous distribution in the USA, with autonomous cars that move around the city with the shopping basket and which can be accessed with a password and without human contact. According to a study conducted by Steer, autonomous delivery cars will generate an estimated \$4.1 billion in value for the USA.

SMARTPAC

SmartPac is an active film for the packaging and preservation of fresh fruit. It allows a slow and controlled release of preservatives from the entire surface of the packaging, achieving a homogeneous and 100% recyclable distribution. This all-in-one system for fresh fruit packaging optimizes the use of labor, minimizes the use of transportation, storage and cooling time of the fruit. Today Smartpac is available with SO₂ emission and other preservatives are being developed.





The future of logistics

“When was the last time you shopped at a supermarket? Any online clothing orders? Doctor’s visits? Food delivery? These are all situations that we experience daily. What is the common denominator? What do sectors and activities such as food distribution, e-commerce, and the health sector share? All of them require processes that have a good or service within our reach, logistics.

Historically, logistics has had a negative connotation, however, like our society and organizations, it is in the process of transformation. A transformation from complicated to complex, from being a cost to being a competitive lever. The question is, what attributes do we want to provide to a logistics-oriented future? How do we want the logistics of the future to be?

1. Collaborative

Logistics has traditionally been understood as a chain. This term must evolve, just as the relationships between the different agents that collaborate in it. We define it as a network, in this case, a supply network. A series of interrelations between people, companies and processes that facilitate the transit of consumer goods from intermediate locations and states to the points where the moment of consumption occurs. Transactional logistics in which the different parties act as unconnected nodes is inefficient by nature. Logistics must integrate, as if it were a gear, under a collaborative approach to all members of the network, eliminating inefficiencies and exploiting synergies.

2. Digital

Horizontal collaboration between the agents of a network produces a better use of new technologies. Thanks to its implementation we can achieve visibility and knowledge. Data allows us to discover opportunities for improvement and tools will automate decision making in processes such as planning, route management or prediction according to variables appropriate to our model. Digital platforms, IoT, Blockchain

and other solutions will allow us to evolve our supply networks towards more efficient, flexible and agile models.

Currently the level of adoption of these technologies in mass in other sectors is a reality, we cannot pretend to be competitive without being digital.

3. Circular

A digital collaborative network naturally becomes sustainable and circular. Collaboration, and the use of digital tools, allows us to maximize the use of resources, making processes more efficient in their way through the exploitation of the generated data.

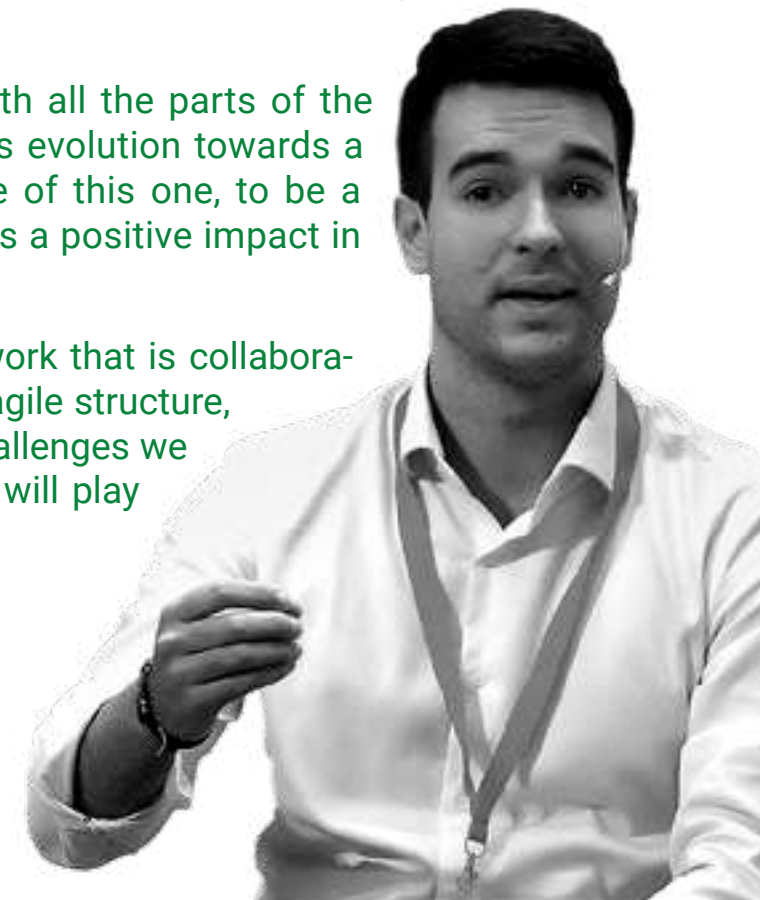
The correlation between collaboration and network digitization is directly related to network sustainability. Circularity allows us to eliminate inefficiencies such as empty transport, eliminate inefficient routes and maximize the use of assets, gradually reducing our impact on the environment.

Nowadays, talking about logistics implies talking about sustainability. Either you are sustainable, or you are not.

Our mission is the active collaboration with all the parts of the logistic network; our vision is a continuous evolution towards a digital logistic network, being the purpose of this one, to be a circular, sustainable network that generates a positive impact in our environment.

We are building a connected logistics network that is collaborative, digital and circular with a flexible and agile structure, because even though we don’t know the challenges we will face tomorrow, we know that logistics will play an essential role in them.

Cristian Ull.
Head of Innovation at Logifruit



FTALKS FOOD SUMMIT 2020
FTALKS FOOD SUMMIT 2020
FTALKS FOOD SUMMIT 2020
FTALKS FOOD SUMMIT 2020

10

Ft talks Food Summit 2020: A bite of the future

After the success of the first edition of Ftalks, we have gone one step further by offering a much more experiential hybrid event, adapted to current circumstances, where attendees could smell, touch, taste and savor the foods of the future through 3 experiences: Future Box, Future Market and Future Dinner.

A BITE OF THE FUTURE
A BITE OF THE FUTURE
A BITE OF THE FUTURE
A BITE OF THE FUTURE



Ftalks'20 shows the rise of the foodtech sector and food innovation worldwide.

This Ftalks'20 edition was celebrated in Valencia on October 15th and 16th, coinciding with the World Food Day, gathered the main actors of the global food sector, including: startups founders, innovation managers, and directors of pioneering companies, journalist and researches. Together we have co-created the Fooduristic'21 report.

Sustainability and the circular economy, the revolution of robots in food service, cultivated or 3D printed meat, personalized nutrition and feeding the cities of the future, were some of the topics presented, analyzed and debated by the most notable voices in the sector. In Ftalks'20, who have highlighted the boom that FoodTech and innovation in the food industry are experiencing.

Raúl Martín, CEO of KM ZERO, underlined during the opening of Ftalks'20 that investment in agri-food tech in the first half of 2020 has moved \$8,800 million in 798 operations - although the estimated projection once all the data are completed would amount to \$10,500 million - according to the latest AgFunder report. Martín stressed the importance of continuing to back this upward trend with Valencia being the center of food disruption.

The Ftalks'20 initiative is promoted by KM ZERO with the support of more than 25 industry partners, public entities, startups and sector leaders. The event has position the city of Valencia as a global reference in food innovation by attracting more than 50 international speakers and over 40 innovative projects. Online attendance reached more than 40 thousand people, over 75 mentions in the media and a great impact on social networks.



For two days, we had more than 50 international speakers, representing the transformation of the sector, and a wide sample of local and global FoodTech projects that are paving the future of food.



“The agri-food sector is paramount to recovery at this time and there are two key elements within the transformation that will take place from the COVID-19 crisis: health and sustainability. These are the two main themes of Ftalks’20”.

Jordi Juan
Autonomous Secretary of Innovation of the Generalitat Valenciana.

“To position Valencia as the Spanish and European city that is a pioneer in promoting innovation in the food ecosystem, capable of addressing current and future challenges and working to solve them, is one of Ftalks’ main objectives”.

Raúl Martín,
CEO of KM ZERO

Ftalks’20 was adapted to the current circumstances, creating a hybrid encounter with in person and virtual attendance, where representatives from industry, food service, technology and research centers, universities, public entities, startups, incubators, accelerators and investors, as well as specialized media and opinion leaders could interact.

On the first day, one of the most outstanding interventions was performed by Didier Toubia, founder and CEO of Aleph Farms. Mr. Toubia presented on cellular agriculture and the future of meat and highlighted that the company intends to launch a high quality product on the market in the near future.

“Aleph Farms is starting to build a facility to begin pilot production of cultivated meat and thus be able to launch the first thin-cut meat fillet during the second half of 2022”.

Victor Martin, founder and CEO of Macco Robotics, has addressed in Ftalks’20

the revolution of the robots in food service presenting two robot dogs that perform the functions of a waiter. He also announced that the company plans to open the Macco Food Experience, a fully robotic restaurant where it will deploy all its technology and will also be open to startups and other companies so they can try it and test it with real customers.

The representatives from institutions took the leading role in the Ftalks’20 round table “What will we eat in the cities of the future?” in which have participated José Miguel Herrero, General Director of the Food Industry of the Ministry of Agriculture, Fishing and Food; Vicente Domingo, director of CEMAS, a joint initiative of the City Council of Valencia and the UN for Food and Agriculture FAO; and Lidia García-García, a technician of agriculture and food of Las Naves, with the moderation of Fernando Martínez, director of Revista Alimentaria.

All of them have stressed that it is essential to promote sustainable food po-

licies at a local level and to work hard to reduce food waste. At present in Spain, 26 million kilos of food are still being wasted every week. They have also pointed out that health, convenience and set the foundations for food trends in 2050.

At Ftalks'20, the prestigious researcher and biologist, VP R&D Health & Wellness at ADM, Daniel Ramón, and Lisa & Alana Mcfarlane, founders of The Gut Stuff, participated online. They spoke about the relationship between well-being, gut health and food, among other aspects.

Javier Sirvent, one of the leaders in technology and digitalization in Spain who is defined as a technology evangelist, has highlighted in his inspiring speech at Ftalks'20 the current three most exponential technologies: artificial intelligence, synthetic biology and quantum computing.

Sophie Egan, author of the book "How to Be a Conscious Eater" and founder of Full Table Solutions, shared with us her guide to becoming more conscious as consumers: to ask ourselves if what we eat is good for ourselves, for others and for the planet.

In Ftalks'20 we learned about the collaboration between a great company like Manufacturas Ceylan with the startup Malferida, which produces and commercializes a cola drink with natural ingredients, along with Carlos Valero, responsible for Quality and R+D of Ceylan and Lucía Mompó, CEO of Malferida. A collaboration in which they developed the concept,

the aroma and the complete formula of the drink.

Other cases of open innovation and collaboration between startups and industry were CAPSA FOOD and Entomo Agroindustrial, Estrella Galicia's The Hop and Trucksters and Dacsa Group with SINBLAT.

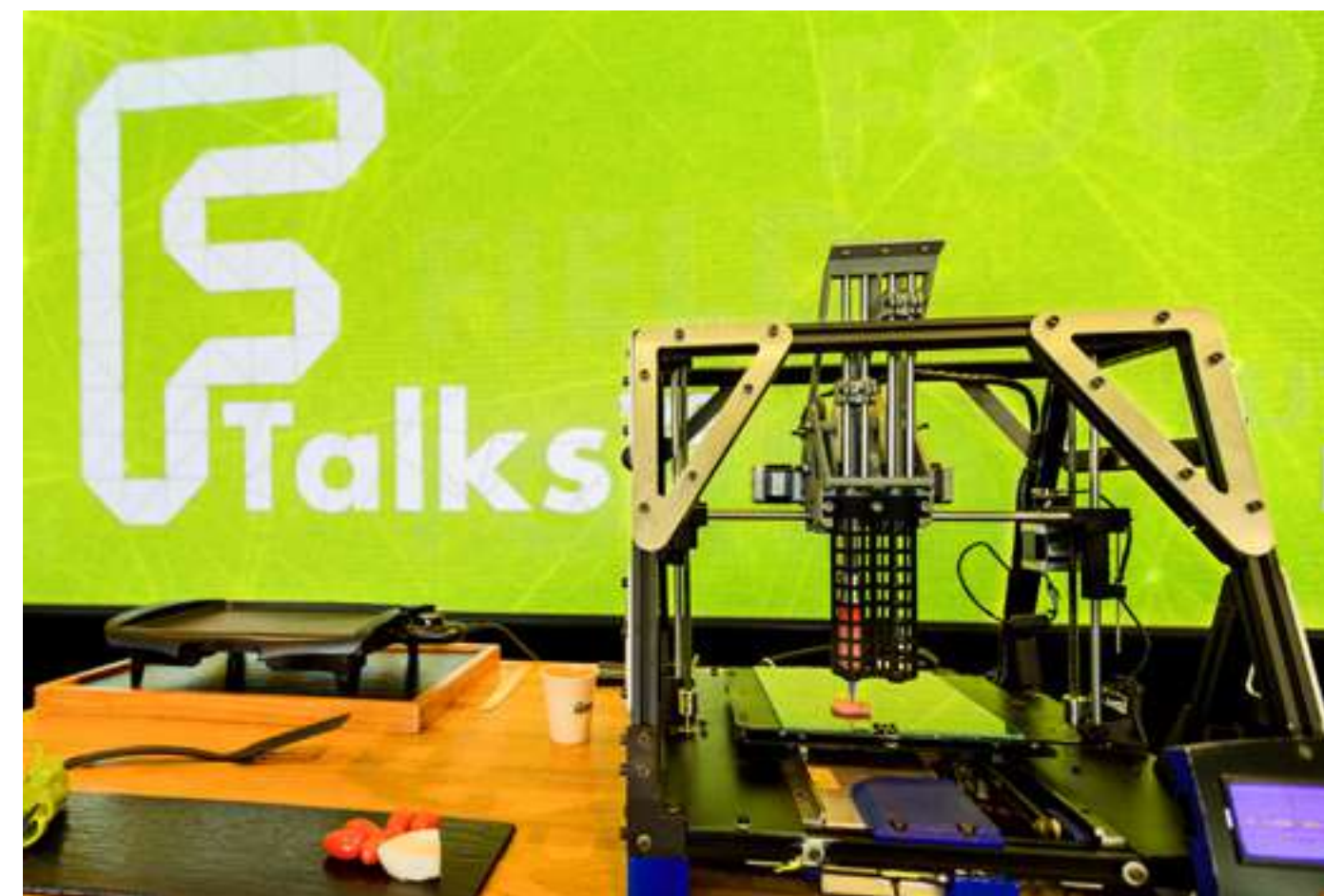
One of the most memorable moments of Ftalks'20 was the participation of Giuseppe Scionti, CEO of Novameat. The startup creator of the first vegetable steak printed in 3D offered a live demo on the steak production and a tasting to attendants. **Giuseppe has highlighted that by 2030, a 10% of the meat global market sales will be based on alternative proteins, which is why big companies are investing, according to a study by Barclays.** He has also announced that his product will soon be on the market; by 2021 he hopes to have it in restaurants and in 2022 he wants to land in supermarkets in collaboration with a partner.

The boom in the foodtech sector is evident not only because of the growth in investment, but also because compared to other sectors, it has been less affected by the pandemic. And this was confirmed at a roundtable discussion by four of the most prominent foodtech funds in the world, which also focus on sustainable startups that are changing the sector. "Driving Impact Investment in the Food Sector" featured Blue Horizon Ventures, Quadia, Big Idea Ventures and PeakBridge.

"The speed of change is faster than our response" is the statement on which

Howard-Yana Shapiro, Senior Fellow at the Center for International Forestry Research and the University of California, Davis, focused his talk. Shapiro said we must change the way we view the challenge of food security, focusing on nutrition security. Food production today is not sustainable and we must find ways to grow more food on less land.

Along the same lines, Santiago Cerdà, Head of Operational Marketing at Bayer Crop Science, talked to us about how to promote biodiversity without undermining food production and how Bayer is doing this through the Baydiversity initiative: Bayer supports farmers in the transition to a more sustainable practices through innovation, in line with the strategy of the European Green Deal.



Beatriz Romanos, founder of The Tech Food, showed us the growing interest of investors in foodtech in the last 2 years, and how in 2020 it was maintained and even grew in some categories, despite the pandemic. While delivery was the focus of investments years ago, in this last year we see alternative proteins and ag-biotech gaining ground. According to Nadav Berger of PeakBridge,

“Nowadays if a startup does not say how it will improve the world, it will not get investment”.



Food has a direct impact on many of the Sustainable Development Goals and that is why in Ftalks'20 we talk about how companies are carrying out strategies and actions to reach the goals set for 2030. B Lab Spain, Quién es el Jefe, Too Good to Go and Bayer discussed this.

One of the most urgent challenges in the sector is related to the sustainability of packaging. Renata Monteiro, Marketing Manager of Tetra Pak Iberia, addressed this topic from Tetra Pak's experience in her talk: How can packaging help the food industry accelerate the transition to a circular economy?

The round table on the new generation of alternative proteins and fats brought together Marc Coloma, founder and CEO of Heura, a pioneer in the production of vegetable meat that emulates meat; Giuseppe Scionti, CEO of Novameat; Gabriel Vicedo, founder and CEO of Trillions, a startup dedicated mainly to the production of sports supplements with insect flour, and Andrés Montefeltro, founder and CEO of Cubiq Foods, dedicated to the production of sustainable cultivated fat, which has recently received €5 million in funding from Blue Horizon Ventures and Moira to scale up and expand its business model. All of them have emphasized that alternative proteins do not come to replace meat, but to be a complementary food to it.

At Ftalks'20 we have also tackled the future of the restaurant industry with Germán Carrizo, a cook and advisor at Tándem Gastronómico, who during the

COVID-19 pandemic coordinated the initiative of the NGO World Central Kitchen in Valencia, feeding 140,000 people affected by the crisis, with the help of KM ZERO and other partners.

In his speech he explained that together with 11 other Valencian chefs they are developing a business model for local delivery through an application, with sustainability as one of its main pillars. Nathalia Ordóñez, Partnership Lead of Take a Restaurant, an initiative dedicated to transforming your home into a restaurant, has highlighted that thanks to projects like hers, great chefs can have direct contact with customers, bringing them their know-how, so they can experience local cuisine from a new perspective.



“The agri-food sector is very important for the city and events such as Ftalks’20 position Valencia as the center of innovation in food at the international level”.

Pilar Bernabé,
Councillor for Economic Innovation and Entrepreneurship, Valencia City Council.



The discussion panel focused on innovation to solve challenges in the food industry was particularly relevant. With the participation of **Danone, PepsiCo, Vicky Foods and Logifruit**, the companies have highlighted the importance of seeking disruptive solutions throughout the value chain to develop products that are local and sustainable. They also draw attention to their collaboration with local and global startups to benefit from their know-how. Something we always talk about at KM ZERO is the importance of innovation to be able to lead the transformation of the sector, developing solutions to the most urgent challenges.

Rodrigo Garcia, Co-founder and Co-CEO of Notpla, dedicated to the creation of sustainable packaging from natural materials derived from algae, showed participants his laboratory and production area located in London.

To reflect on the positive impact on food service we had IKEA Food, The Cooking Clubster and Leanpath. At Ftalks’20 we also had participation of Chef Bosquet and the vision of innovation from the universities and research centers in a panel with AINIA, EDEM, the University of Valencia and the UPV.

The best foodtech startups, awarded in Ftalks'20

At KM ZERO, we launched a call for startups to choose a group of startups to make their pitch during the event. These startups had the opportunity to be chosen as one of the two best startups in this edition of Ftalks, in addition to being able to present their project to investors, heads of public institutions, food industry professionals, the media and opinion leaders. Finally, we selected 8 startups from which an expert jury chose the best in the **Sustainability** category, for offering a solution that generates a positive impact on people and the planet; and the best in the **Innovation** category, for offering a solution that stands out for its technological development and business model.



Agrosingularity, a decentralized platform to produce raw materials based on agricultural by-products for the generation of powdered ingredients, thus contributing to the circular economy, won in the category of Sustainability. The other award-winning startup, in the Innovation category, was **Plant on Demand**, a digital platform that

facilitates the daily work of small producers and local retailers, providing greater efficiency and performance of their resources.

Both startups have been selected by Marta Ibañez, CEO and Founder of Capital Singular, Pedro de Álava, Senior VC & Fund Manager of Clave, and Leandro de Oliveira,



Founder Motus Management, and have received a trophy designed by Naifactory Lab, the Spanish startup creator of a bio-compostable material made from olive stones: reolivar, which also exhibited in the Future Market other pieces made from this material.

Thanks to the award, Agrosingularity and Plant on Demand will have access to KM ZERO's customized mentoring program and will also be able to be presented to investors and have visibility on Fooduristic, our original content online platform, through interviews and participation in future events.

The other 6 startups participating in the contest - Oscillum, Salsy, Robin Good, Innomy, Vegaffinity and FoodStories - have become part of the KM ZERO community and will have access to future networking opportunities.

Ftals'20: hybrid and experiential event

We developed a hybrid event, adapted to the current circumstances, which was much more experiential than the previous one, where attendees have been able to smell, touch, taste and savor the food of the future through 3 moments: Future Box, Future Dinner and Future Market.

Future Box:

The box with the most innovative products to live Ftals'20 at home

At KM ZERO, we designed a box with a careful selection of innovative products, provided by the main players in the transformation of the sector, including companies and startups, which we previously sent to the virtual assistants so that they could also be part of the Ftals'20 experience.

The Future Box is a sample of new solutions and products for the challenges of the food sector, adapted to new consumer habits.

- **TASTRY** Panettone Jars: Artisanal pastry without additives using natural and local ingredients. They use the vasocottura technique, in week glass jars.

- Agua de Selva **AUARA**: Organic lemon and pomegranate refreshment with functional properties and without sugar. With organic and fair-trade ingredients.

- Agua de Oceana **AUARA**: Organic lemon and lime soft drink with functional properties and without sugar. With organic and fair-trade ingredients.

- **BONIAFIT's** Sweet Potato Chips: Snacks without colorants or sweet potato preservatives. 100% handmade.

- Hummus with 3 garlic and roasted tomato from VEGADENIA: Hummus from organic agriculture with products of KM0 and 100% eco-responsible.

- Fig chocolates covered with ruby chocolate from **BOMBONES LA HIGUERA**.

- Edible **SORBOS** straws: Edible straws of multiple flavors, without allergens or gluten. Personalized for Ftals'20.

- **TRILLIONS** cricket protein energy bars: Flavored bars made with insect flour.

- **HUMAN FOODS** Functional Bars: The world's first organic daily nutrition bar, made specifically to support a vegan diet.

- **BIOGRAN** Clipper Teas: Organic teas rich in antioxidants. Packaged in unbleached bags without metal staples.

- **BIOGRAN** Vitaseeds seed bag: Organic flax seeds ground with buckwheat, hemp, sunflower, pumpkin, sesame and blueberry.

- **RAW** Isotonic Drink: Organic sports drink, with ecological and healthy ingredients, suitable for vegans and coeliacs, which recovers electrolytes and achieves sugar-free hydration.

- **BEPLUS** bioactive smoothies: cold-pressed bio-produced vegetables enriched with different functional properties; in convenient pouch format.



Future Market:

The first floor of Veles e Vents becomes the supermarket of the future

Throughout the two days, attendees found a diverse sample of the foods that will gain more and more ground on shelves in the coming years. Some of these products which were also in the Future Box, like water from Selva and Oceana from Auara, the original size jars of Panettone from TASTRY, the Trillions bars and the sweet potato chips from Boniafit. Other products from the Future Market include:

- **Tulivas:** Cookies made from olive protein. Suitable for vegans, coeliacs and lactose intolerant.
- **Bokaras:** Snack for sports people made of “Cacau del Collaret” in two varieties: sweet and salty.
- Milk from **QUIÉN ES EL JEFE:** Fair pay milk for farmers. It belongs to a marketplace where members vote the type of product they want to consume.
- **QUIÉN ES EL JEFE** olive oil: Product of 100% Spanish origin, also voted by the members of the marketplace. It also provides fair remuneration to farmers and supports olive-growing areas at risk of depopulation.
- New **TETRA PAK** Packaging: Compostable and biodegradable multilayer packaging.
- **VEGADENIA** product range: Among the main products exhibited by the firm, the “sobramisada” with “cacau del Collaret” stands out, made from organic agriculture with KM0 products and 100% eco-responsible.
- **Agrosingularity:** Raw materials transformed into powder for the food industry, contributing to the development of the circular economy.
- **TRILLIONS:** cricket protein energy balls: Flavored balls made with insect flour.
- **KOROKO** flavored eggs: Eggs with truffle, blue cheese, garlic and ham flavors.





- **Aldous Bio:** Certified organic and vegetarian products of the highest quality. Chlorella, spirulina, maca and coconut oil, among others.
- **Ceratonia:** Natural sweeteners extracted directly from the fruit of the carob tree, which are marketed as a syrup for the final consumer or as an ingredient for the industry.
- **Oscillum:** Intelligent label that allows to see the freshness of the products through color changes.
- **Mochi Luxury:** Handcrafted mochis of various flavors.
- **Human Food:** Nutrition bars made from organically grown whole foods, with biodegradable packaging and carbon neutral shipping.
- **Naifactory:** New line of circular materials that use the olive stone as a base.
- **Biogran:** Leading Spanish producer and distributor of packaged organic food.
- **Okao:** Special variety of cocoa that has recently been introduced in the market in the form of ruby, the “fourth category of chocolate”.
- **SEAMORE** seaweed nachos: Nachos made with 35% seaweed. They are vegan, gluten-free and rich in iodine.
- **Hola Plate:** Porcelain plate with small holes on its surface through which up to 25% of the fat in the food is filtered.
- **Ositos & Co:** Gummy bears with alcohol. Gin, rum, vodka, tequila and whiskey flavor.
- **Carlota Organic:** Range of vegan and organic products such as stews, creams, hamburgers, sauces and patés.

Future Dinner:
SDGs dinner endorsed by Chefs' Manifesto

The first day of Ftalks'20 was full of content, networking, innovative products and experiences, and it ended with the dinner of the future. The menu, designed by KM ZERO, had innovation and sustainability as its main themes. In this way we tell the story through dishes, that future food does not have to be too different to what we already know, provided that it is healthy, nutritious and tasty.

For the dinner we sought advice from Chefs' Manifesto, an initiative backed by the UN where cooks and professionals linked to gastronomy share and promote concrete actions with the aim of aligning with the Sustainable Development Goals (SDGs). They endorsed our menu certifying that it met the conditions of their Manifesto: local product, zero waste and nutritional qualities, among others.

Paul Newhman, founder of Chefs' Manifesto and the chefs Alejandra Schrader, Natalia Restrepo, Palmiro Ocampo and Daniel Kaplan gave us a tour of several of the ingredients we were going to taste at dinner and told us about their origin and their way of consumption.



GOOD FOOD MAKES PROGRESS POSSIBLE



Our global Ftalks initiative continues to bring together projects and people who are developing solutions to face the most pressing challenges in the food sector. The aim is rethinking existing models and moving them towards more sustainable, open and inclusive alternatives.

We know that, in order to generate a great impact we need to be united. That is the main reason why we want to continue being a link between the different actors of the sector that facilitates interactions through Ftalks, the Fooduristic platform and also through these pages.

In order to continue nurturing our network we require commitment, responsibility and action. We believe that only through the decisions we make today, we will be able to build that tomorrow we dream about. Our invitation is to continue creating the future of food together.



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PARTNERS AND COLLABORATORS





Food Innovation Hub

KM ZERO is the open innovation hub that is dedicated to generating talent, products and solutions for the food ecosystem, collaborating with startups with the aim of promoting their development and consolidation.

As a link between knowledge, society's needs and industry, it co-creates solutions to tomorrow's challenges with innovative and sustainable projects to help companies in the sector successfully face the future.

KM ZERO creates and promotes Ftalks, the global and collaborative initiative that reflects on the future of food with the leaders of the sector, which includes Fooduristic, the multimedia content platform with podcasts, webinars, videos, articles and the annual report on Fooduristic'21 trends and best practices.

KM ZERO identifies, connects and fosters collaboration among the people and initiatives that are driving the transformation and working towards a more sustainable food future.

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