

The Plant-based Revolution:

How Plant-centric Diets Are Transforming Food

2022 Edition



Contents

- 03 Introduction to the plant-centric consumer
- 08 The global plant-based market
- 15 Technologies to watch out for
- 20 The forces driving the shift
- 23 In person: interviews with plant-centric stakeholders
- 27 Looking forward: what will the plant-forward movement possibly look like in 2030?



When citing data contained in this paper, Lantern must be cited.

Commercial use of the original study, as well as any derived content, is not permitted, and the distribution of any related materials must be carried out under the same license that regulates the original study.

Introduction to the plant-centric consumer



Image: Unsplash, Oriol Portell

A monumental global shift in diet preferences, of such unprecedented scale, does not come around very often.

At Lantern, we've taken a front-row seat to the development and growth of plant-forward diets, which has pushed us to continue exploring the importance of the economic, socio-cultural, environmental, technological, and political factors driving the movement and shaping its future.

Over the years, many have asked us whether this movement is a passing phase, but we have known from the beginning that this is a powerful shift that is here to stay. Throughout this paper, we analyze the penetration of plant-forward diets around the globe, as well as the driving forces behind this paradigm shift, and explore insights shared in interviews with agents of the plant-based ecosystem. We take a closer look at new frontiers in

such as plant-based cheese, eggs and seafood. For companies still defining their strategies in this space, we bring a scenario analysis based on our interpretation of the present signals that anticipate what the plant-forward future may look like. We finish off this thought piece in a more festive way, listing restaurants and shops not to be missed in order to experience the trend first hand, and taste delicious plant-forward food.

It is important to emphasize that Lantern, with this paper, is not trying to opine on the benefits of any specific diet. We will leave that to nutritional experts and each person's own convictions.

Our glossary of definitions

Although the definitions of vegetarian and vegan diets are clear, the definition of flexitarian can vary significantly between different sources. The strictest definition of flexitarian, which we used for our 2021 edition of The Green Revolution, defines flexitarians as those that follow a primarily vegetarian diet but only eat meat on occasion. Other, more lenient definitions, qualify anyone who puts some type of restriction on their meat consumption as flexitarians. For this paper, we will be using the following definitions:

- **Omnivores:** no restrictions on their consumption of animal products
- **Flexitarians:** those that follow a plant-based diet, with occasional consumption of animal products

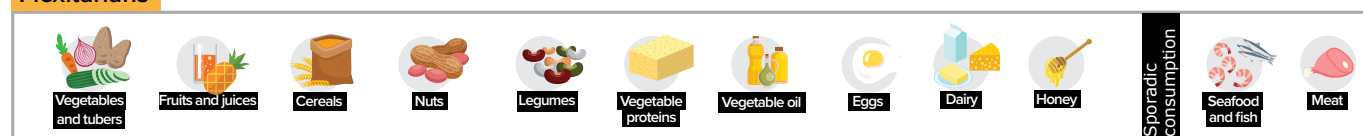
About the authors

Lantern is a strategy, innovation and design consultancy that works with leading Food & Beverage companies and organizations seeking to grow better and faster. We identify our clients' growth opportunities and activate them by defining new strategies and business models, designing products and services, and creating engaging experiences and brands.
Read more at www.lantern.es

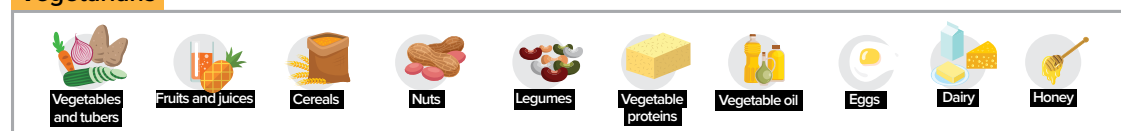
the expansion of this unstoppable movement, including precision fermentation & cell-based meat. We also bring light to exciting categories poised for future growth,

Types of plant-forward diets

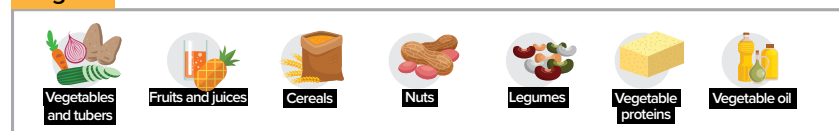
Flexitarians



Vegetarians



Vegans



- **Vegetarians:** those that eliminate meat and seafood, but continue to consume dairy products like milk or cheese, as well as honey
- **Vegans:** consume no animal products whatsoever

Throughout this paper we will be referring to flexitarians, vegetarians, and vegans as one collective group: plant-forward consumers.

Global Consumer data

Globally, plant-forward consumers are no longer a niche group. Although strict vegans and vegetarians are still a relatively small group, there is a significant, growing number of consumers that are decreasing or restricting their intake of animal products (flexitarians). This change can be driven by a variety of concerns including, environmental concerns, animal-welfare concerns, or health concerns.

According to a global study by Euromonitor, flexitarians accounted for 42% of consumers in 2020, while vegetarians and vegans accounted for 6% and 4% respectively. In this case, Euromonitor defines flexitarians as people who put a restriction on their consumption of animals. Although that study makes use of a more lenient flexitarian

definition than ours, the trend is still clear: more people than ever are looking to reduce their consumption of animal products in favor of a more plant-forward diet. Regardless of definitions, these figures offer evidence that more than half of global consumers are now trying to eat less animal protein.

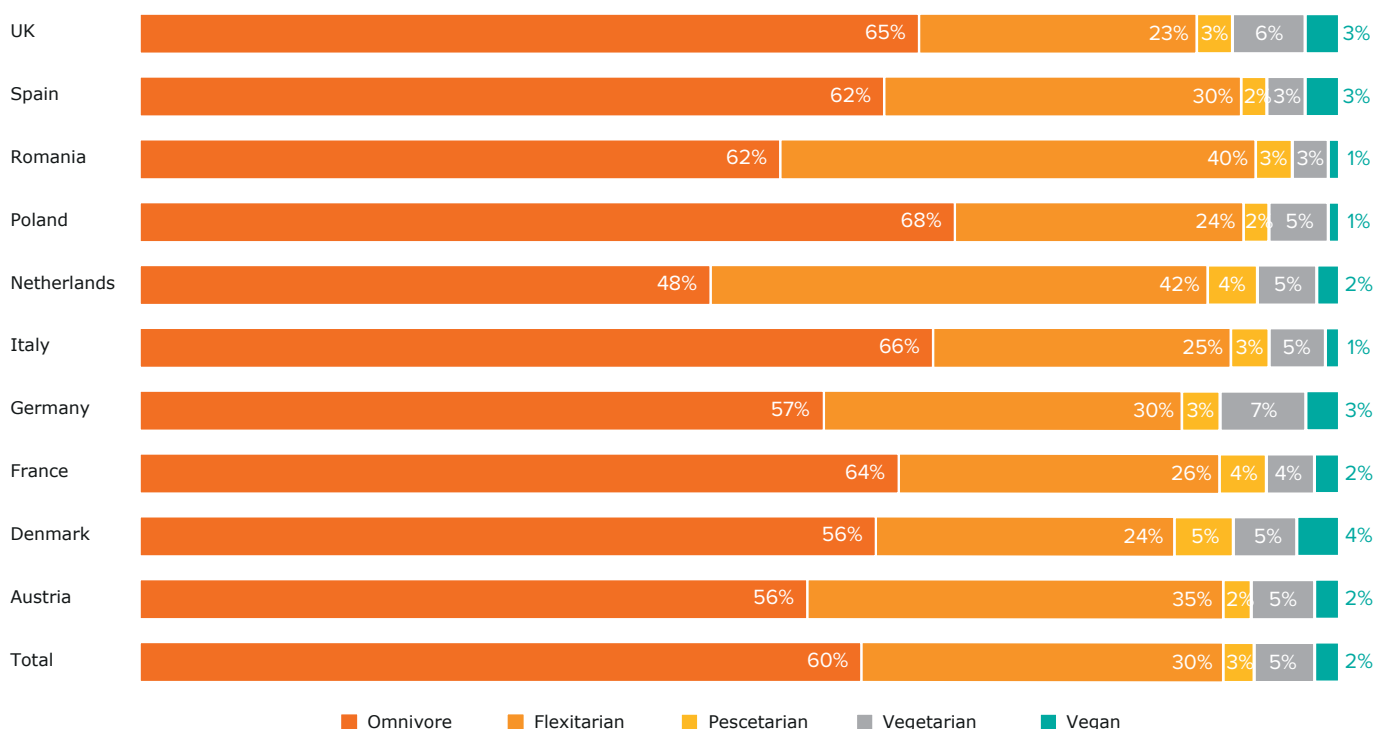
Looking at specific regions and countries, evidence of the plant-based trend can be seen all over the world.

A European study by ProVeg, a plant-based advocacy organization, that surveyed 10 European countries, found that 37% of Europeans identify as flexitarian, vegetarian, or vegan. Even more interestingly, 46% of people that allow meat in their diet (omnivores and flexitarians) said they would eat less meat in 2021 than they did in 2020.

In our study The Green Revolution 2021, which also uses a stricter definition of flexitarian, we found that about 11% of Spanish consumers and 9% of Portuguese consumers identify as flexitarians.

More than half of global consumers are now trying to eat less animal protein.

Diet Distribution by Country



Source: Smartprotein (ProVeg), What consumers want: A survey on European consumer attitudes towards plant-based foods, 2021

In the **United States**, plant-forward consumers are also a significant portion of the population. According to a report by the Hartman Group in 2021, plant-forward consumers represent 20% of the American population, with 10% of respondents being classified as flexitarians. Additionally, the Hartman Group breaks down consumer diets into very specific categories: 4% are vegan, 6% are vegetarian, 43% are omnivores, 9% are white meat eaters (no red meat), and 23% are carnivores (meat lovers that make a point of eating it regularly). It is important to note that this study uses the stricter definition of flexitarian (mostly vegetarian but eat meat on occasion), which likely explains why plant-forward consumers represent a smaller percentage of consumers than in other studies.

forward diets and this demand will drive the rapidly growing plant-based market to create new and innovative products.

Plant-forward consumer profile

Defining a specific consumer profile for plant-forward consumers can be challenging, as this trend has largely found its place among a variety of countries, cultures, and lifestyles. However, there are some demographic groups that tend to be more plant-forward than others.

Regarding age, younger generations tend to be more plant-forward than older ones. In a global Euromonitor study, it was found that 54% of Generation Z members avoid meat or other animal products, compared to 34% of Baby Boomers. This is also reflected in our The Green Revolution 2021 study, where we found that plant-forward diets have the greatest penetration in the 25-34 age range among Spanish consumers (16.5%).

Younger generations could be more plant-forward because they already perceive these products as more ethical, sustainable, and healthy. As younger generations grow up with more access to a variety of high-quality plant-based products, we will likely see an increasingly higher percentage of people adopting plant-forward diets with each passing generation.

A slight preference towards plant-forward diets can be seen among women in comparison to men. According to data from Gallup, 6% of American women are vegetarian, compared to 4% of men; additionally, twice as many women are reducing their meat consumption than men.

In a global Euromonitor study, it was found that 54% of Generation Z members avoid meat or other animal products, compared to 34% of Baby Boomers.

In some regions, like in Spain, the percentage of plant-forward consumers is beginning to even out between genders. Based on results from The Green Revolution 2021, men in Spain have gone from representing about 1 out of every 3 plant-forward consumers to representing nearly half, in just 2 years. While women have pioneered the adoption of plant-forward diets, we foresee going forward that men will also play an important role in driving growth.



Image: GOOD MEAT Eat Just

A survey by OnePoll, commissioned by the plant-based manufacturer Eat Just, found that nearly 60% of US respondents agree that their eating habits are increasingly shifting towards plant-based.

Plant-forward consumers also represent a significant part of the Asia-Pacific region. According to research conducted by DuPont and IPSOS, over a third (36%) of consumers in the region already consume a low or no meat diet, representing approximately 1.5 billion people. There is also evidence of a growing intention among consumers in this region, like we have seen in Europe and the US, to reduce meat consumption overall. Research from Kerry's APAC Consumer Study 2021 found that 32% of consumers are actively cutting their meat consumption, while 28% have already done so. That's a total of 60% of APAC consumers that are reducing or have reduced their consumption of meat.

Regardless of how diets are defined, there is without a doubt a global transition occurring in consumer behavior. More consumers are beginning to favor plant-

Motivations

In general, there are three principal motivations behind adopting a plant-forward diet: sustainability, health, and concern for animal welfare. However, when it comes to ranking these motivations by importance, there does seem to be a slight difference among flexitarians, vegetarians, and vegans.

Animal welfare

For vegans, animal welfare tends to be the most relevant concern, which makes sense as their diet eliminates animal products entirely. A global study by Euromonitor found that “animal rights” was the most common driver for following a vegan diet, as expressed by 37% of respondents. On the other hand, the most common driver for vegetarian diets was health reasons, with 42% of respondents claiming they are vegetarian because it “makes me feel healthier”.

Health

Health is also a very relevant driver for flexitarians as, in The Green Revolution 2021, it was the most commonly cited reason for following this type of diet, as expressed by 60% of Spanish respondents.

Seeing as how health is a major driver for consuming more plant-based foods, it is important for plant-based manufacturers to consider health when designing these products. Some plant-based products sacrifice health for taste, resulting in a product that is highly processed, which could be detrimental if we consider that many flexitarians, as well as open-minded omnivores, are mainly seeking plant-based products for health reasons.

Sustainability

Sustainability is another key reason consumers follow plant-forward diets: a 2020 study by Euromonitor found that environmental concerns were the 3rd most common motivation for both vegans and vegetarians. As climate change becomes more critical and consumers continue to become more aware of the environmental impacts of animal product consumption, meat & dairy reducing diets are likely to become more prevalent. According to Nielsen data, 62% of consumers in the US would be willing to reduce meat consumption due to environmental concerns.

Meanwhile, in some regions, plant-forward diets have played a relevant role that has remained rather constant over time, as consumers may be motivated by cultural or religious factors. For example, in India, nearly 80% of the country's population is Hindu, a religion where the consumption of beef is avoided. In the Middle East, pork is largely avoided due to religious reasons as well. Other, non-religious factors may also begin to gain importance in these regions and lead to further growth in the consumption of plant-centric products.

Barriers & Drivers for Plant-forward diet adoption

Main barriers to plant-based diet adoption:

- Currently, plant-based alternatives tend to be priced at a **premium** when compared to traditional products. For consumers that are curious about plant-based products but do not have a strong motivation to purchase them, this price barrier could prevent them from trying alternatives altogether. In that sense, achieving price-parity with animal protein will be one of the key areas of work for plant-based brands and retailers in the coming years.
- **Taste** is another important factor, especially when it comes to plant-based products that try to mimic the flavor and texture of traditional foods. Although plant-based products have made great strides in imitating animal products, few have succeeded in creating an indistinguishable copy.
- This requirement of direct imitation of traditional products can lead to the issue of **unnaturalness**, as some manufacturers have sacrificed healthiness and naturalness of their products in favor of flavor. This prioritization of flavor can result in plant-based products that taste great but are highly processed.

Drivers of future growth in the plant-based category:

- The most significant driver in the adoption of plant-based products will be **technology and process advancements**, which could greatly improve the flavor and texture of existing products. As we discuss later in this paper, innovative technologies like precision fermentation and cell-based meat production will allow producers to achieve products that are near identical to the real thing.
- **Emerging plant-based alternatives** like eggs, cheese and fish are poised to gain traction and further drive the plant-forward market, as we will discuss in the following section.
- Plant based diets are also expanding beyond their initial consumer segments to reach broader swaths of consumers. Many **new segments** are approaching the category, but perhaps the evening out of men and women plant-forward consumers will represent the most significant target expansion in coming years.

The Global Plant-Based Market

2



Image: Karmesano Karma veggie

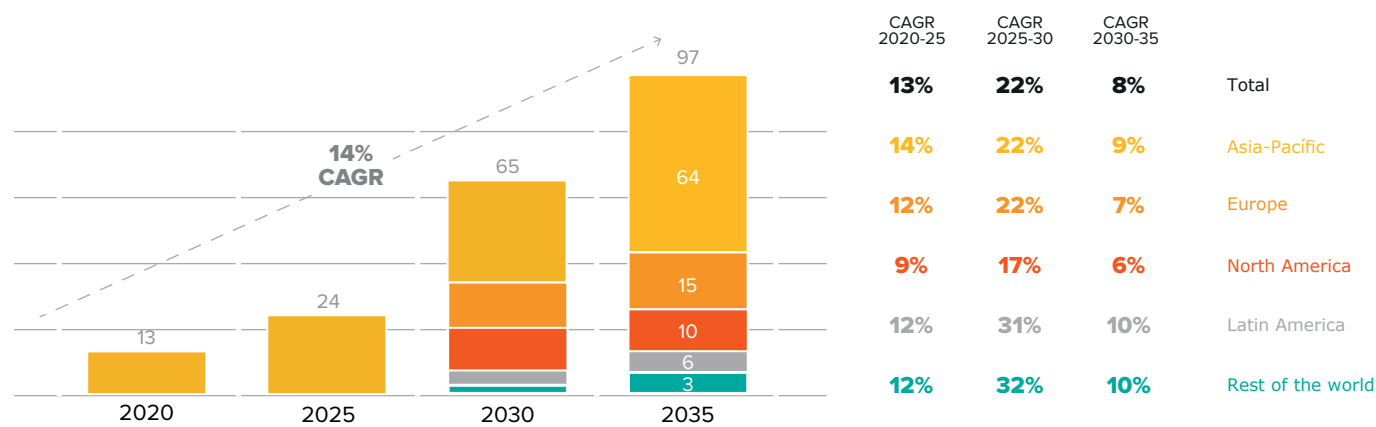
By no means a geographically confined phenomenon, the plant-based market is headed towards explosive growth at a global scale.

According to different sources, Asia will be the market with the greatest development in the coming years, although Europe will also show interesting growth and will be the second region in terms of consumption for these types of products, significantly surpassing the weight of North America in the plant-based market.

Considering that stricter vegetarians and vegans account for only 10% of the global population, it is important to consider which group is driving the significant growth we can see in plant-based product consumption. It turns out that the consumers driving plant-based sales are those who eat animal products as well. According to the Hart-

Sales of Plant-Based Foods by Region

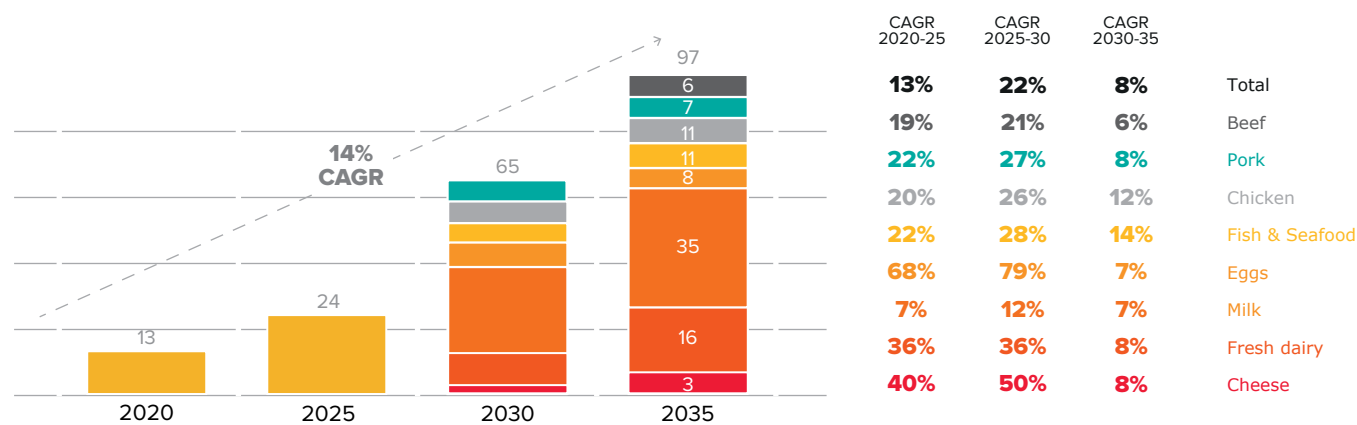
Consumption of alternative proteins by region



Sources: US Department of Agriculture; euromonitor; UBS; ING; Good Food Institute; expert interviews; Blue Horizon and BCG analysis.
¹North America includes only the US and Canada.

Vegetable-based drinks and other dairy alternatives will dominate the market, followed by chicken and seafood

Global consumption of alternative proteins by product



Sources: US Department of Agriculture; euromonitor; UBS; ING; Good Food Institute; expert interviews; Blue Horizon and BCG analysis.
¹North America includes only the US and Canada.

man Group, only 15% of American purchasers of meat-alternative products describe themselves as vegan or vegetarian. Similar data has also been announced by two of the most successful plant-based meat companies operating in multiple markets, Impossible Foods and Beyond Meat, who have found that more than 90% of consumers that eat their products also purchase animal products.

According to the Hartman Group, only 15% of American purchasers of meat-alternative products describe themselves as vegan or vegetarian.

Plant-based products are no longer being seen as products intended exclusively for consumers that restrict their intake of animal products, but rather as an alternative that adds variety to the existing products in supermarket aisles and restaurants. Plant-based offerings have the potential of broadening product ranges and generating higher rotation within categories, thanks to the wide

variety they generally entail. Among traditional animal milks, for example, most variation comes from different levels of fat reduction, whereas plant-based milks can be based on a wide variety of ingredients, and hence “flavors” (almonds, oats, soy, rice, pea, etc.).

According to the consulting firm BCG, very significant growth at a global level is still expected in several categories. While dairy substitutes will maintain their leadership in market size, followed by meat substitutes (beef, pork and chicken), the strongest growth is expected in vegetable alternatives for eggs and cheese (categories whose market size currently is not very large).

In this section we wanted to zoom in on categories where we think there are still some relevant challenges to growth and that are at an interesting point in their development and expansion. As such, we’ve narrowed in on developments in the world of meat substitutes, fish, eggs, and cheeses. The world of vegetable-based beverages, being the most prevalent, is well developed and continues to grow by creating new varieties and flavors, as well as improving its organoleptic qualities and nutritional profile.



Image: just egg

Image: Cocuus



Meat substitutes: from ground beef to filet

Plant-based burgers and vegetable chicken nuggets are already very common products with a growing presence in supermarket aisles: Beyond Burger (USA), Impossible Foods (USA), Garden Gourmet (Switzerland), Unconventional (Italy), NotBurger (Chile), Gut Bio (Germany), Heura (Spain) ...large corporations and new emerging companies have bet on these products and led to a plant-based market where achieving differentiation is becoming increasingly difficult.



The major challenges facing the “meat” category now lie in the search for cuts that imitate whole pieces, progressive improvements in terms of flavor and organoleptic qualities, and the reduction in the number of ingredients. Companies must also consider transitioning from a “product-focused” to a “brand-amplification” strategy, whereby consumers begin to feel truly connected to the brand's values and purpose.

The search for “whole cuts”. Up until now, a significant majority of meat substitutes have been developed by focusing on imitating processed meat products. Thus far, ground alternatives have been easier to achieve than whole pieces that convincingly imitate the muscle texture

of animals and the marbling of the fats. New technologies, like 3D printing, are already developing pieces more similar to an original, animal-meat-based steak.

Faced with this challenge, there are several food tech companies that are clearly betting on solving it. Spain is actually at the forefront of some interesting developments, with two start-ups working on new solutions. Novameat (Spain) is developing a pea, seaweed, and beetroot juice mix extruded into fine fibers that recreate muscle tissue, while Cocuus (Spain) claims that they can already print steaks, bacon, or ribs at a speed of 9 kilograms per minute, without sacrificing a single animal.

Another challenge in this category is the taste of the products: Fat, due to its organoleptic qualities, plays an essential role in this objective, since it can improve the texture and flavor of products like, for example, Iberian ham. A significant part of the funds invested in the plant-based world are dedicated to companies that are developing new fats made from vegetable products.

The final challenge, but by no means the least important, is the reduction of the ingredients list, looking towards products that are as clean-label as possible. Plant-forward consumers, as we noted, adopt their diet mainly for health reasons and that does not mesh well with ultra-processed products with long ingredient lists.



Plant-based alternatives to fish & seafood

The category of plant-based fish & seafood is growing quickly and represents a significant opportunity in the market, given that plant-based fish & seafood account for only 0.06% of the US seafood market. (Good Food Institute- Opportunities in Alternative Seafood, June 25-

Image: Newwave taco

2020). The global demand for fish continues to increase and this growth is being covered for now by traditional fishing and aquaculture.

“Plant-based fish in 2021 is what plant-based burgers were in 2019” The Beet

Although there is still a lag in demand from consumers, some actors have already begun to surface, calling for a reduction in excessive fishing due to its potential environmental impacts. Documentaries like *Seaspiracy* from Netflix remind us of the effects that the global fishing industry has on the environment, and this concern could act as a catalyst for category growth. In just the first 6 months of 2021, alternative seafood companies saw record investments reaching \$116 million.

The common goal of all new products in this space is, of course, to achieve the taste and texture of traditional seafood. The company Ocean Hugger Foods (USA) relies on chef James Corwell, a certified master chef, as one of its founders to aid in achieving this goal. The company's mission is to "Create delicious, sustainable, plant-based alternatives to the most common fish that delight even the most discerning palates" Their first launch in 2016 was a plant-based alternative to bluefin tuna that

they make from tomato. Tomato contains a high level of glutamic acid, responsible for the tasty flavor or umami of original tuna, which helps to create a similar effect in plant-based alternatives.

The Spanish startup Mimic Seafood has also decided to develop a vegetable alternative to bluefin tuna from tomatoes, which it has named Tunato. Other startups are betting on different seafood products: New Wave (USA), focusing on shrimp, the most widely consumed fish in US households; the French company Odontella and the startup Wild Type Foods (USA) for salmon in different formats, raw or marinated... Large companies are also



Image: Wild Type Foods

Animal-free Seafood Startup Landscape

Trellis Road

	North America	Europe	Asia
Animal-cell based			
Plant-based			

joining the wave, such as Nestlé, with its Vuna, a mixture of 'vegan tuna' made with 6 ingredients: water, pea protein, wheat gluten, rapeseed oil, salt, and a natural flavor blend.

Image: Les Merveilleux



Plant-based alternatives to eggs

Eggs are the most consumed animal protein in the world. Globally, average egg consumption is at 161 eggs per person per year, according to the FAO; some higher-consumption countries, like Mexico, Japan, and Colombia, consume about twice as much as the global average. Included in many traditional recipes, breakfasts and pastry preparations, plant-based alternatives to eggs come in different forms, liquid or solid, depending on their intended purpose or use.

Many of these products are based on aquafaba as a key ingredient. This product, discovered not too long ago, is nothing more than the cooking liquid of chickpeas and beans. Its content of proteins, starches, and other vegetable elements that are transferred to the cooking water

make it an ideal substitute for eggs, since, like eggs, it emulsifies and serves as a binder.

It seems even more difficult to create a plant-based egg that comes in a shell-like a real egg and that contains a yolk and egg white. Merveilleux is the proposal of the Parisian startup 'Le Papoudu', founded in 2017 by two women and whose



product is expected to hit the market very soon. This company has achieved a very similar aesthetic to that of an egg, with its egg white and yolk, which is distributed in an oval packaging, like an eggshell.

In Singapore, Float Foods is also working on their plant-based version of a whole egg, the OnlyEg, which is planned to be released in Asia in 2022, a market with a lot of potential.



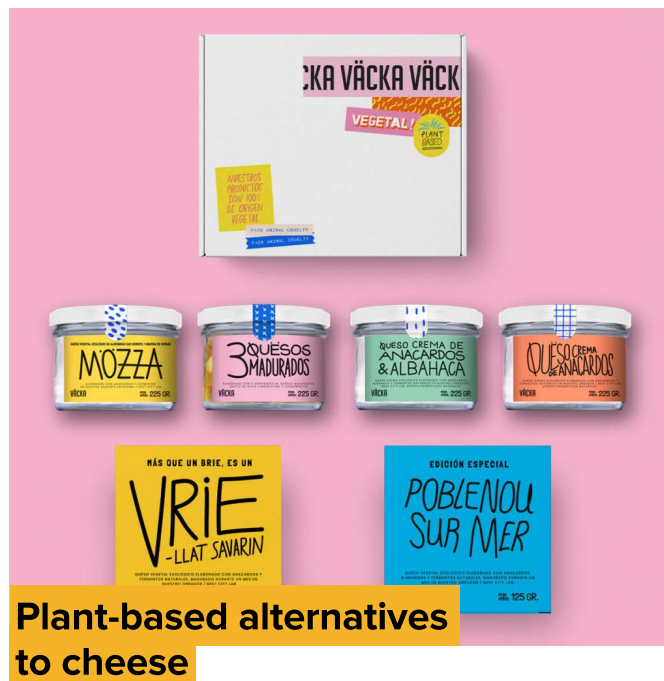
Meanwhile, the American company JUST, a pioneer in the category, has already sold the equivalent of 100 million eggs, in their plant-based version. This is a company with a strong mission, which goes far beyond just eggs: seeking to change the food system and make it better for every community. Just's team includes biologists, engineers, and chefs. They have studied the organoleptic characteristics of hundreds of plants and created a platform to mix different vegetables, each with their own contribution of properties, such as elasticity or gumminess, combining them to obtain the desired result.



Image: Papoudu

Just has a liquid version of their “egg”, an already cooked version in the form of a folded omelet, and vacuum-cooked ‘egg’ morsels of different flavors. In October of 2021, they received EFSA approval for their key ingredient, mung bean protein, paving the way for commercialization in Europe.

Image: Craft plant-based cheese-maker Väckal!



Plant-based alternatives to cheese

Cheese is a product deeply tied to indulgence and pleasure. According to Neal D. Barnard, author of the New York Times best seller "Cheese trap" we could call it "dairy crack" if we consider that the dairy proteins it contains, especially casein, can act as mild opiates and provoke the release of small doses of dopamine. Will "vegan cheese" become as addictive as original dairy?

The North American startup Nobell Foods has just received USD\$75 million in investment to complete the development of its vegan cheeses. To do so, they have managed to develop casein by modifying the soybean plant in order to produce it. This is how they get the main ingredient to replicate the texture and elasticity of the cheese. "The cheese is melty, mellow and elastic, everything you

"The cheese is melty, mellow and elastic, everything you expect from cheese," says Nobell Foods CEO Magi Richani.

expect from cheese," says CEO Magi Richani. The global market for “vegan cheese” was valued at

\$2.7 billion in 2019 and is expected to reach \$4.6 billion by 2025 (8.9% CAGR). According to Research and Markets, Europe represents approximately one-fourth of this market with brands like Violife (Greece), Tyne Cheese Limited (UK), and others at the forefront.

Violife is one of the most established companies in the sector with more than 30 years of experience and a mission to create a plant-based alternative to cheese. In fact, this company of Greek origin has been the protagonist of one of the most important movements in the plant-based cheese market in the last year, being acquired by the multinational Upfield (Flora, Vaqueiro...), controlled by the KKR Investment Fund. The transaction was valued at €500 million.



That is not the only major company that has taken an interest in this category. The French dairy company Bel Group (3.4\$b turnover), one of the leaders in the sector, has already announced that the cheese segment will be a very important part of its strategy. They have recently launched their global brand Nurishh (France) as the flagship of their plant-based offering. The giant General Mills, meanwhile, has also been investigating this area, piloting a brand mockup called Renegade Creamery until very recently. In November 2021, this project evolved into their launching the brand Bold Cultr, based on a collaboration with Perfect Day to develop products like cream cheese, shredded cheese and cheese slices.

Small producers of vegetable alternatives to cheese are also emerging, such as the companies Väckal and Veggut from Spain, which produce their products in an artisanal way. Their production process uses traditional



cheese-making techniques adapted to a new raw material: almonds. They use local organic almonds that are transformed into an almond drink

and then undergo a fermentation and maturation process that allows the development of deeper aromas and flavors. The final result is 200g almond-based pieces with different flavors: Provence, smoked, original, and rustic...The label of their products is very clean: 72.5% almonds, water, salt, fermenting bacteria, and herbs from

Technologies to watch out for

3

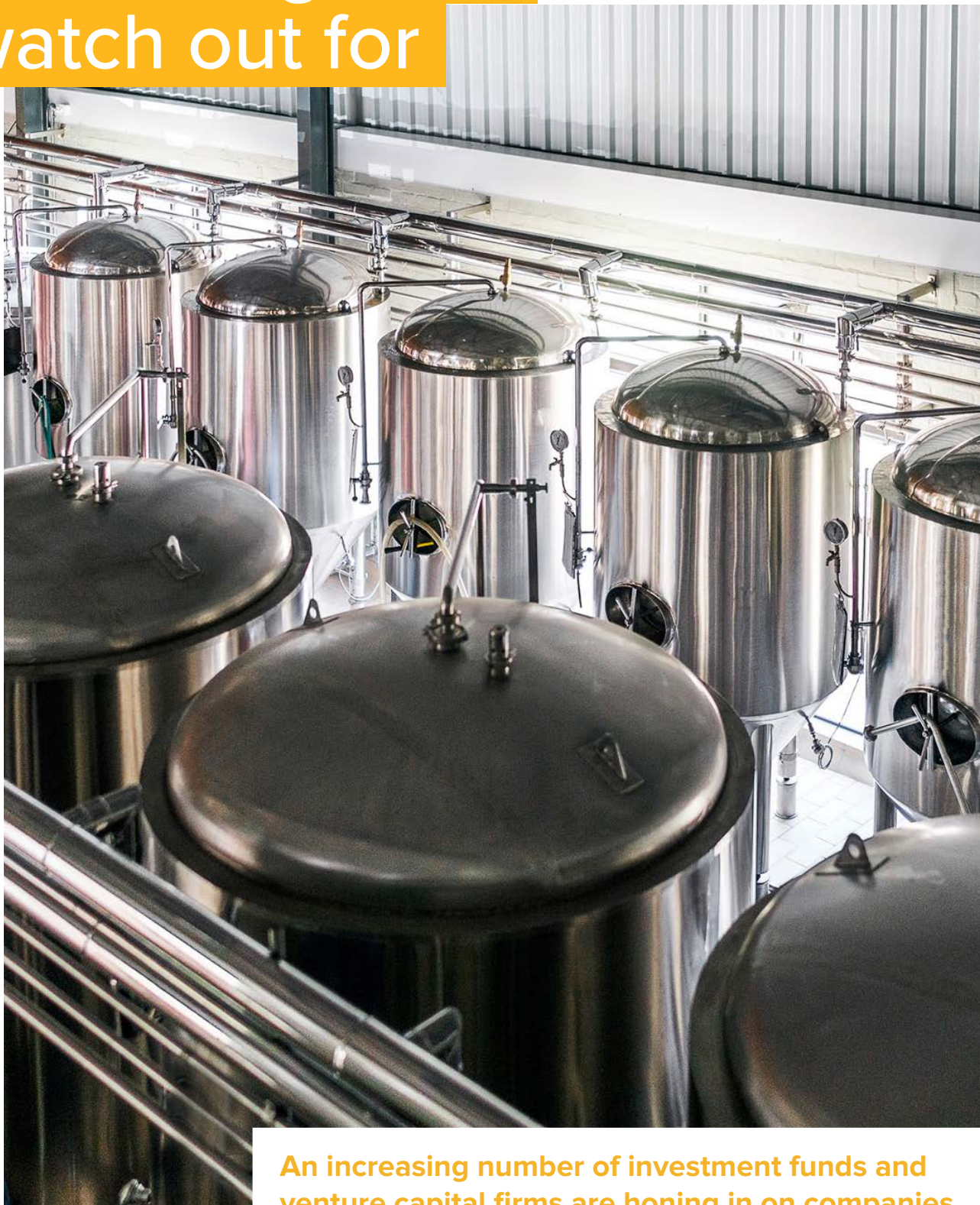


Image: GFI

An increasing number of investment funds and venture capital firms are honing in on companies and start-ups in this sector, adding financial fuel to a shifting paradigm.

In conversations we have had with members of some of the funds that are investing in plant-centric alternatives, they've identified a few key areas they are focusing on:



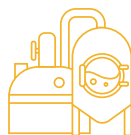
Plant-based: products made from vegetables such as soybeans, peas, oats, etc. The investors interviewed believe that there is still room for improvement in this area, especially in certain categories such as plant-based alternatives to fish, cheese, and eggs. The category is evolving towards more flavorful and, above all, more affordable products.



Vertical farming: an area that has been evolving for years but has not yet reached its tipping point. It needs to be scaled up and made available in more places.



Cellular agriculture: still under development, this technology promises to create meat and fish that is identical to natural meat and fish. It is based on stem cells of animal origin that, using bioreactors, are multiplied until the desired form is reached. The technology is already a reality; the next challenge lies in making it scalable and affordable.



Precision fermentation: a very promising technology that, through a fermentation process and the use of fungi or bacteria, is able to develop materials to create new ingredients with even better nutritional profiles than traditional animal proteins. A true revolution in the development of new foods.



Plant molecular farming (PMF): similar to precision fermentation, but using plants instead of bacteria or fungi as cell factories, or recombinant protein production hosts, to produce ingredients that traditionally only exist in animal products.

In this section, we will discuss two of the most exciting technologies being developed in the sector: cell-based meat (also known as cultivated or lab-grown) and precision fermentation.

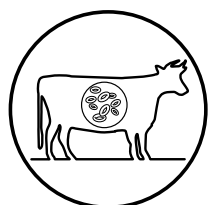
Cell-based Meat

Lab-grown, cell-based or "cultivated" meat is an emerging category in the meat-alternatives space. At the end of 2020, Singapore became the first country in the world to authorize the sale of cell-based meat: the American company Eat Just is the first company to commercialize its lab-grown chicken nuggets in this Asian city-state.

How does cell-based meat work?

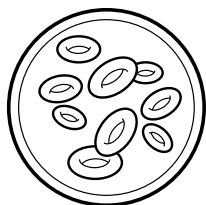
McKinsey
& Company

1 Cell lines are purchased/ developed for perpetual use



Developed/ purchased animal cell lines are preserved in cell banks; when producing a batch, the cells are thawed in small shake flasks and moved to seed train bioreactors

2 Cells grow in nutrient-rich media in seed train bioreactors



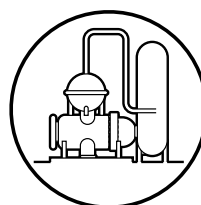
As cells grow in volume and increase in density, they get moved along the seed train into progressively larger bioreactors

3 Cells reach desired density in the main bioreactors



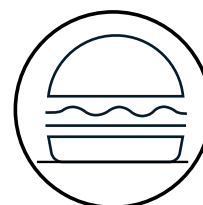
The optimal cell density strikes a balance between cell volume and batch time (ie, longer batch time, higher cell density); when cells reach a desired density in the main bioreactors, the bioreactors are drained into centrifuges for harvesting

4 Cells are harvested in a centrifugation process



Cells pass through a continuous centrifuge, which separates the media from the cells and achieves a low concentration of media in harvested cells

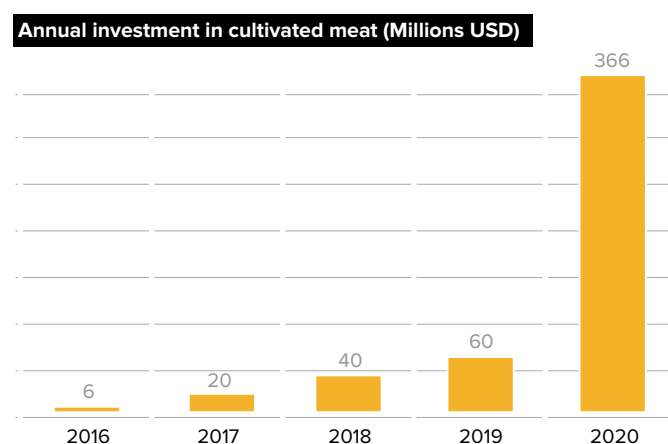
5 Harvested cells are prepared for distribution



Meat cells are prepared for distribution with processes varying based on end product; cells can be blended with other additives to achieve the desired texture before being formed and packaged for storage and distribution

Source: McKinsey ("Cultivated meat: Out of the lab, into the frying pan") & Good Food Institute cultivated meat overview

Although still in its infancy, this industry is looking to compete with the existing meat industry by using a process that addresses sustainability and animal welfare concerns associated with traditional meat production. There is already significant activity promoting its growth, with nearly 100 active start-ups having received funding of around USD\$300 million in 2020 and USD\$250 million in the first half of 2021 (McKinsey). However, the industry still faces many issues including costs, sales approval by governing bodies, and consumer acceptance.



SOURCE: GFI analysis of PitchBook data.

Note: Data has not been reviewed by PitchBook analysts.

Price point is an issue, but companies operating in this space claim to have found ways to significantly reduce their costs over time. According to McKinsey, companies have been able to reduce production costs by 99% compared to the first prototypes and could reach price parity with traditional meat by 2030. Recently, the Israeli company Future Meat Technologies debuted the first industrial plant for the production of lab-grown meat. The plant is capable of generating 500 kilos of meat per day and promises competitive prices, like a lab-grown chicken breast for \$3.90.

Although it will take time, obtaining regulatory approval is a challenge that will likely be overcome soon. As mentioned previously, Singapore became the first country to approve the sale of lab-grown meat. Other countries are following suit, and the United States is the most open country following Singapore. The Food and Drug Administration and the US Department of Agriculture have agreed to regulate cell-based product approval jointly but cell-based seafood, as opposed to beef or chicken, will likely be the first product to obtain approval, as it is the only category that will be regulated solely by the FDA. Products will be reviewed on a case by case basis and could be in stores very soon; the Israeli company Future Meats aims to have their cell-based products available in the United States in 2022.

Approval in Europe could be more of a challenge as regulatory bodies tend to be more conservative, but there is a path to approval through the EU's Novel Food Regulation published in 2018. Under this updated regulation, novel food authorizations are generic rather than specific. This means that once cell-based meat is approved, any company could commercialize their product in Europe without needing to go through the approval process individually, assuming the conditions of use, labelling requirements, and specifications are met. However, companies can also apply for individual authorization that lasts 5 years, in order to protect new scientific evidence or proprietary data. This encourages innovation but could hinder competitiveness in the European market for cell-based meat.

However, the biggest obstacle for the cell-based meat category could be consumer acceptance. Although cell-based meat offers a more sustainable alternative to red meat (particularly if produced using renewable energy) and essentially eliminates animal rights concerns across meat categories, most consumers today are not open to buying this type of meat. According to a study conducted by Nielsen in the US (2019), only 12% of consumers would be willing to eat cultured meat grown in a lab. This is not too far off from the results of our study The Green Revolution 2021, which found that only 17% of Spanish consumers would be willing to buy lab-grown meat. However, some studies are finding more openness when it comes to trying, rather than buying, cell-based meat: a 2020 paper published in the MDPI Journal of Foods found that 44% of French and 58% of Germans would be willing to try cultured meat.

According to a review published in the Journal of Meat Science, one of the most significant objections to cultured meat is the perception of unnaturalness or concerns of excessive interference with nature, along with taste, price, and safety concerns. The burden will be on manufacturers to convince consumers that cell-based meats are both safe and healthy, especially since most consumers will likely struggle to understand the process involved in producing them. While consumers may be willing to try cell-based meat out of curiosity, if they do not believe it is safe and healthy for day-to-day use, it is unlikely they will purchase it with frequency.

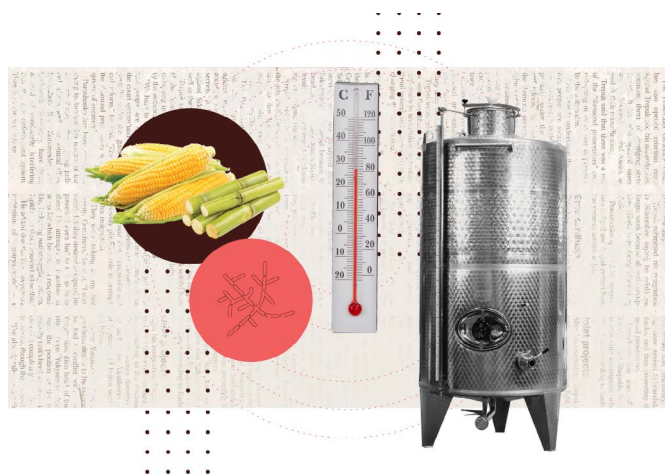
The name chosen to represent this industry could play a significant role in consumer acceptance. Currently, the most commonly used names are "cell-based meat" and "cultured meat". The industry is trying to move away from terms like "lab-grown" or "in-vitro meat" as these names have less-natural connotations. Ultimately, manufacturers in this space must educate consumers on their processes and demonstrate that their products are as safe as traditional ones. However, before focusing on issues of perception, companies must first make sure their

products taste good, are affordable, and are approved by the relevant governing bodies.

Aside from the challenges facing cell-based meat, this emerging technology holds a lot of potential when it comes to product innovation. Using cell-based meat processes, manufacturers could be able to achieve more accessible versions of meats that are currently less commercially viable or more expensive to produce through traditional farming methods. For example, the production of Wagyu beef with cell-based technology is being explored by the company Orbillion Bio (USA). A bit further outside the box, the Australian company Vow Food is looking into more exotic options, like cultured zebra or kangaroo meat.

Precision Fermentation

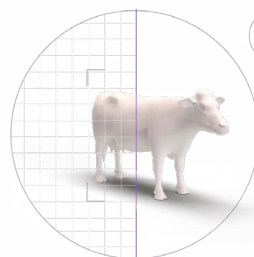
Fermentation technology has been present in human food processes for centuries, but may also be a defining solution for the future of food. Not only because of its diverse applications but also because of the reductions in cost and quantity of necessary inputs involved in its manufacturing; according to RethinkX (a think tank focused on disruptive innovations) "precision fermentation will be 10 times cheaper than animal proteins by 2035".



So how does it work?

Precision fermentation is the process of using microorganisms to create specific ingredients that enhance the taste or mouthfeel of meat-alternative products. Starting from an ingredient and using controlled fermentation and specific microorganisms, it is possible to produce enzymes, vitamins, proteins, fats, natural pigments... which can then be used for food manufacturing. The result of this targeted fermentation is even expected to improve the nutritional profile of alternative proteins over the originals.

Companies like Perfect Day (USA) already use precision fermentation to recreate cow's milk and manufacture dairy products such as ice cream, yogurt, or milkshakes. They are able to produce milk with the same proteins as cow's milk, whey, and casein, which are what give this drink its creaminess, texture and flavor.

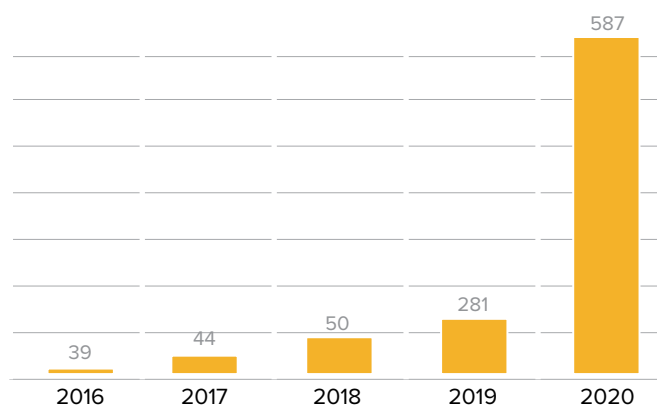


They achieve this from a genetic model that they add to a microflora, which is then fed sugar and ferment that it converts into a protein similar to that of cow's milk. The result is an ingredient that can be used to produce dairy products that are very similar to traditional ones.

Ingredients derived from precision fermentation could greatly enhance many plant-based alternatives, in terms of both flavor and function.

Ingredients derived from precision fermentation could greatly enhance many plant-based alternatives, in terms of both flavor and function. For example, the heme protein used by Impossible Foods (USA) to recreate the iron-rich feel of real meat was created using precision fermentation. The Protein Brewery (Netherlands), another promising company in this space, is producing the neutral "Fermotein", a fermented fungi protein that has no strong taste, odor or color, making it very versatile ingredient for use in a variety of products. The Every Company (USA) will be rolling out the world's first fermented egg proteins in 2022.

Annual investment in fermentation companies (Millions USD)



SOURCE: GFI analysis of PitchBook data.

Note: Data has not been reviewed by PitchBook analysts.

This industry is very new with a total of 51 companies focused on fermentation for alternative protein products, according to the Good Food Institute (GFI). More than half (28) of these companies have emerged very recently, being formed in 2019 or 2020.

Most of the companies in this industry are focused on developing B2B models and are not solely focused on fermentation. This could be great news for the industry as it will allow many companies to take advantage of process improvements and new technologies, rather than a single brand holding sole ownership of a specific technology or ingredient.

Despite being a relatively new space, investments in this sector are advancing rapidly. Compared to 2019, investments in 2020 doubled to a total of \$587 million, according to the GFI. However, much of this growth can be attributed to the success of Perfect Day (USA), which raised USD\$300 million in their Series C funding.

For a clearer picture of the cell-based meat and fermentation start-up landscape, we have compiled a non-exhaustive list of start-ups in the space that have received significant funding.

Most funded cultivated meat and fermentation start-ups of 2020

	America	EMEA	Asia-Pacific
 Cultivated Meat	   	    	   
 Precision Fermentation	    	   	

Funding data sourced from: GFI – 2020 State of the Industry Report Cultivated Meat and 2020 State of the Industry Report Fermentation

The forces driving the shift

4



Image: Unsplash, Carl Campbell

Never before has food been so relevant to all aspects of life. Regulators, media and other stakeholders have placed their focus on not only what we eat, but how we eat it.

The plant-based trend we are discussing in this paper is, without a doubt, one of the biggest movements that the food system has undergone since industrialization and the emergence of food brands. And, as in any system, there are multiple actors shaping the future of this change.

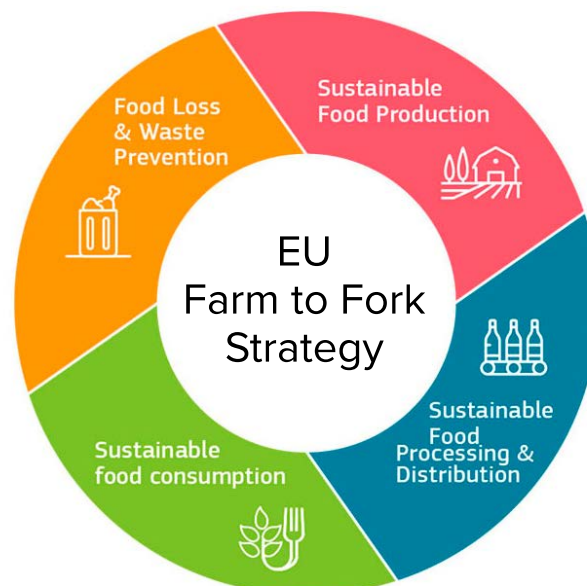
The industry and manufacturers are, of course, one of the driving forces and the one that has had the most weight in defining and developing the foods we consume now and will consume in the future. In addition, there is the consumer, who, through their purchasing actions, are determining how offerings are evolving. But within this trend, they are not the most relevant or even the strongest voice in defining the direction of the plant-based movement. There are other actors and external forces that have a lot to say and are generating a shift towards a more sustainable and healthy system.

Among the stakeholders defining this shift, we have identified four as the most relevant and most determined to make our diet evolve towards being more plant-forward. These actors are public institutions, mostly international, the ecosystem of startups and investors, the plant-forward lobbies and, finally, the retailers. Each of them, from their own position, is driving a change with a global scope, but for the time being, focusing on more developed economies.

The administration

Large international organizations like the United Nations and its agencies (FAO and WHO) have already identified the food system as one of their fundamental areas of activity, with the goal of moving towards healthier and more accessible food for a growing population, as well as fighting climate change. While we have yet to see other public institutions in the Americas or APAC adopt similar legislation, one of the most relevant global initiatives promoting plant-based diets is being carried out by the European Union and the European Commission, within the scope of a new strategy called the Green Deal and its food component, From Farm to Fork.

The European Green Deal sets a course for Europe to become the first climate-neutral continent by 2050.



pesticides and antimicrobials, reducing excess fertilizers, increasing ecological farming, improving animal welfare, and reversing the loss of biodiversity. To this end, they identify a change in the diet of Europeans as one of the key factors, which also seeks to reverse the increase of excess weight and obesity on the continent. Their proposal entails an evolution towards a more plant-based diet with a reduced consumption of meat and processed meat products.

The Commission will work in 3 key areas: (1) empowering consumers by providing them with more information through better food labeling, (2) improving the availability and price of healthier food by assisting local governments in finding the best sources of supply to achieve this, and finally, (3) providing tax incentives that support this more sustainable and healthy system.

The lobbies

We can also find different lobbies and organizations that support and try to accelerate these types of initiatives, seeking a transition towards a more plant-forward society that is less dependent on the use of animals.

In Europe, these associations form part of the European Vegetarian Union, that seeks to introduce vegetarian issues into the political agenda of the European Union. They are also the managers of the vegan/vegetarian V-Label, the most established label on European shelves.

Among the organizations that make up this Union is ProVeg, an international organization created in 2017 whose mission is to reduce the global consumption of animal products by 50% by 2040. Their work focuses

on collaborating with the different stakeholders in the value chain to make plant-based lifestyles more attractive and accessible.

This organization is active in several countries, working closely with companies, the media, and public institutions to support achieving its goal. One of their main objectives is to facilitate the transition to plant-based products and, to this end, they point towards access, price, and convenience as the determining factors.

In the United States, the most prominent non-profit association focused on plant-forward diets is The Good Food Institute (GFI). The GFI was founded in 2016 with the goal of promoting plant-based and cell-based alternatives to animal products. This organization is active globally, with additional affiliates in Brazil, Europe, Israel, India, and Asia-Pacific.

The GFI performs a wide range of activities to promote animal protein alternatives including research grants, providing free access to industry data, entrepreneurial support, and policy advocacy.

Retailers

Large retailers are usually the first to observe trends and see how consumption is evolving thanks to their sales data. As a result, they are no strangers to the plant-based movement, and many have found in it a way to differentiate themselves from other brands.

In addition, most retailers have made improving the health of their customers through better food a key part of their CSR activity and efforts to promote the UN SDGs. It is an objective that shifts their focus, in part, towards healthier products, better labeling and also offering more plant-based alternatives.

The level of dialogue that retailers have with both administrations and manufacturers makes them a very relevant player when it comes to this change in the food industry. They are also a determining factor in setting prices within the category.

In some countries, retailers are beating brands in developing plant-based products.

Globally, we have seen how retailers such as Lidl, Whole Foods, Carrefour, and Trader Joe's have even launched their own brands of plant-based products. Retailers in countries where this trend is more developed have identified this business gap and have begun, almost before brands, to develop plant-based products. Additionally,

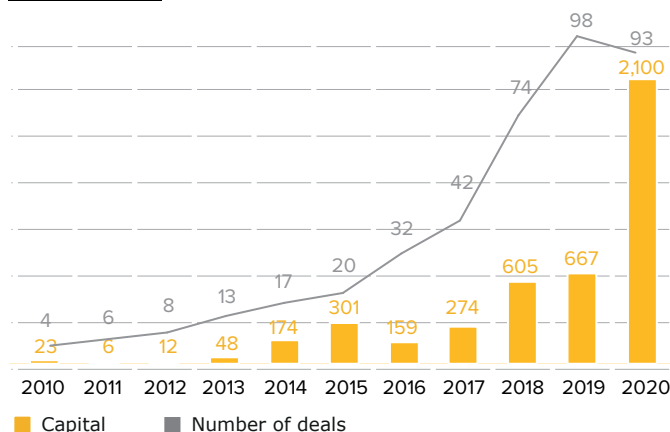
in response to growing demand, specialty vegan online marketplaces like Veji have begun to emerge.

Venture capital and its support of startups

As we've mentioned, venture capital is fully focused on expanding this category. While total investment in startups in the agri-food sector reached just over \$30 billion, the novel foods area alone, which is mainly comprised of alternative proteins, reached over \$2.3 billion with a total of 260 transactions. When it comes specifically to plant-based products, total investment reached \$2.1 billion globally with a deal count of 93. The growing interest in this space is clear, there was more than 3 times as much investment in plant-based products in 2020 compared to 2019.

The moment is clearly ripe for investment. The area of pure technology has already reached a level of maturity that makes it difficult to achieve the returns of the past. However, food is an area that has undergone very few significant changes for many decades and calls for a

Global annual investment in plant-based companies (Millions USD)



SOURCE: GFI – 2020 State of the Industry Report: Plant-Based Meat, Eggs, and Dairy, GFI analysis of pitchbook data.
Note: Data has not been reviewed by PitchBook analysts

thorough overhaul. And finally, as we have seen, governments are supporting this transformation through financing, incentives, and strategic regulation of the sector.

Additionally, these VC funds are investing in the rest of the supply chain. There is still a need for more and better technology and machinery to develop these new products, as well as ingredients to achieve the right organoleptic characteristics and cost targets. One example is the cost associated with the use of reagents and substrates needed for cultured meat production, which are currently too expensive to make the product economically viable for a majority of the population.

In person: interviews with plant-centric stakeholders

5



Image: Abbot's

Tobias Leenaert



Co-Founder ProVeg

Proveg is an organization founded in 2017 that seeks to achieve a plant-based world and more specifically reach the objective "that 50% of the population follows a veggie-diet by 2040". In conversation with Tobias, he expresses: "we want food to be sustainable and compassionate and that is why we exist and why we work with different entities: media, consumers, companies To advance this mission."

This organization identifies developing countries as the main barriers to achieving the objective of a plant-based diet majority, as they are the countries that are currently increasing their meat consumption. On the other hand, in the West, making the product more accessible by working on price and convenience, as well as taste in some of the categories, are the main barriers. Availability is also a challenge, as right now people who want to follow this type of diet have to make an extra effort to find these foods. "Good should be the easiest thing to do," says Tobias.

"Good should be the easiest thing to do," says Tobias.

Convenience and ease of use will be key so that the population incorporates more and more plant-based products into their diets. It is a process that takes time: "Vegetarianism started with vegetables, legumes, lentils... and then the plant-based industry developed because of the demand for something more". Another breakthrough that will have to happen in this market, according to Leenaert, is the development of a product story. Beyond helping the planet, new products will have to elaborate more storytelling regarding why they are more attractive and interesting than other alternatives (the origin of ingredients, craftsmanship, etc.).

Regarding cell-based meat, Proveg sees it as an interesting alternative to the use of animals in food and possibly more suitable for meat consumers. Tobias understands that there are some perceptual barriers to overcome, but considering the total volume of meat consumed, with only a percentage of consumers adopting this product, the impact can be very relevant.

The next step is the entire process of legal and sanitary approvals, which ProVeg expects to be gradual and will depend on each country and region.

Frank Cordesmeyer



Founder&Managing Partner Good Seed Ventures

Good Seed Ventures is a family-owned venture capital company that invests exclusively in sustainable food solutions. "We can no longer produce food the way we do now, we have to change it globally," says Frank Cordesmeyer from Tel Aviv. To do this, "we need to diversify the protein portfolio, taking into account the three pillars of Price, Convenience and Flavor, which have to be up to the task."

Some of the areas in which they are currently investing are precision fermentation (Formo - Germany), insect-based foods (Illucens - Germany), yogurt alternatives (Yofix - Israel), meat substitutes (Planted - Switzerland), cell-based meat (Meatable - Netherlands), cell-based fish (Finless Foods - USA), and vertical agriculture (Lite+Fog - Germany). Always with a focus on reducing the environmental impact of food.



Image: yofix.co.il

Among the main barriers he identifies in the development of the sector is consumers' perception of what they see as healthy and nutritious. "It has been instilled for many years that animal protein helps us to be stronger and that has had a big impact on our purchasing decisions," says Cordesmeyer. Today though, he points out, that's already being questioned, and it could lead to a big change.

Cordesmeyer also believes that subsidies received by livestock farmers should start shifting towards more sustainable solutions for the planet, as well as creating more infrastructure and support for the development of startups in this area.

"It has been instilled for many years that animal protein helps us to be stronger and that has had a big impact on our purchasing decisions," says Cordesmeyer.

Regarding the plant-based startup ecosystem, he believes that not enough is being done in Europe, there is a need for more funds and more investment in basic research by universities. There is still a long way to go to improve the ecosystem compared to Israel, where he is currently located, where they manage to integrate research hubs, startups and venture capital funds in an efficient way.

Kristen Rocca



Senior Associate at Unovis & New Crop Capital

Unovis Asset Management is the world's leading investor in the alternative protein sector. Its investment focus is on the development of plant-based and lab-grown substitutes for animal products such as meat, seafood, dairy and eggs. Through its fund, New Crop Capital Trust, and now The Alternative Protein Fund, it aims to transform the global food system by investing in solutions that enable sustained behavioral change and eliminate the consumption of animal protein products. To do so, they focus on the entire value chain. Their portfolio includes well-known brands like Beyond Meat (USA), Heura (Spain), Good Catch (USA), Oatly (USA), Aleph Farms (Israel) and Mosameat (Netherlands).

One of their main focuses is on the infrastructure needed to make cell based meat scalable. Precision fermentation is the other relevant area for their company, as it will allow them to improve the nutritional profile of many plant-based products.



Image: Eatplanted

Finally, they are also focused on making plant-based products more adapted to local needs. The replacement of minced products such as hamburgers and sausages is already a reality, making it increasingly necessary to look towards the whole piece and more country-specific adaptations or uses, such as meatballs for pasta or chorizo for a stew.

In terms of the barriers they identify, in the cultured meat section there is the regulatory issue, especially in Europe where they are much stricter than other regions. Likewise, for plant-based products as a whole, Kristen believes that making them more affordable and palatable remains a major barrier to growth.

In the future, Kristen sees potential surrounding hybrid products: products that integrate lab-grown and plant-based elements. There is also still a lot of development ahead in the world of fat, which is key in adding flavor to products. By categories, vegetable alternatives to fish and eggs, together with fat, are the ones that still have the greatest room for improvement and where they are focusing when it comes to their investments.

Inderpal Kaur

Founder at Plant Futures, Ex-Plant Based Lead en Tesco

Inderpal Kaur, Indy, has been involved in new food product development for over 15 years in various positions in food companies. Her most recent position, before becoming a consultant specializing in plant-based products, was at Tesco, where she led the plant-based product and trend identification area. All this gives her a very interesting insight into the plant-based movement.

A plant-based diet can be affordable and inexpensive, but it has the added complication of having to know how to cook it so that it is not monotonous and boring.

From her point of view, a plant-based diet can be affordable and inexpensive, but it has the added complication of having to know how to cook it so that it is not monotonous and boring. Eating a more plant-based diet requires an effort that today's society is not willing to make. For that reason, in the development of new products, convenience and price are key. Here, distributors have a very important role to play in helping to set the price of these products.

In her experience in product launches, she has identified several barriers that make it difficult for consumers to adopt this new diet. On the one hand, the vegan product icon often generates rejection in non-vegan consumers because they do not feel included, and many assume that it is not going to be a product that will satisfy them. Likewise, the number of ingredients and the lack of knowledge or recognition of many of them are also a barrier to consumption.

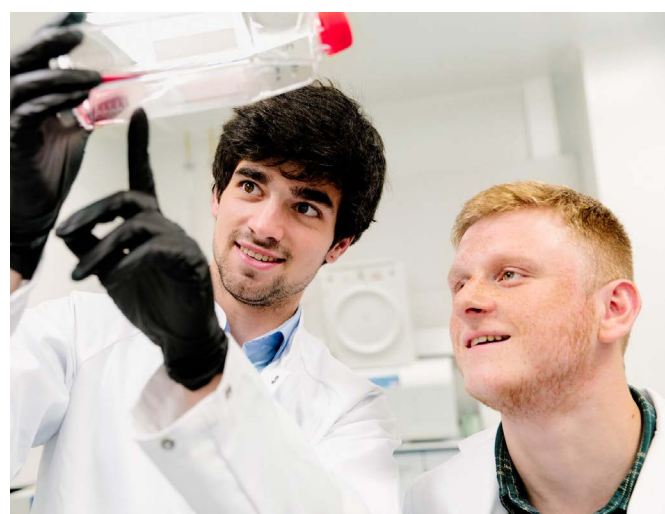


Image: Mosa

On the other hand, social pressure is also relevant among the barriers to adopting a plant-based diet. On many occasions the adoption of this diet is identified with activism that generates a tense situation in social environments. Additionally, in family environments, it generates a relevant logistical complexity if a family member is the only one to adopt this type of diet within the household.

From her experience in retail, Indy observes that retailers will be very relevant participants in this change. Most of them are making commitments to reduce their impact on the planet in terms of their carbon footprint, but also looking towards improving the health of their customers and helping them make better choices. It is also important to note their close relationship with the administrations, with which they maintain a high level of dialogue.

Finally, in order to make progress in the development of a gastronomic culture around plant-based diets, Indy points out the need to make them more attractive. In this aspect, the role of influencers will be fundamental to achieve a "cooler" image within new generations.

Looking forward: what will the plant-forward movement possibly look like in 2030?

6



Image: Unsplash, Bakd&Raw by Karolin Baitinger

A broad view of the various layers of analysis included in this paper provides several clues regarding the plant-forward future. From this vantage point, Lantern has developed a few foresight scenarios.

What we're including here is a small summary of a more complete and in-depth future foresights exercise, that dissects and analyzes the signals, trends and axes of change that could become pivotal for the future of the plant-centric movement.

A caveat: this exercise's intention is not to predict, but rather to facilitate meaningful reflection, foster strategic thinking and lay a foundation for decision making in the medium and longer term.

As we've seen, the next 10 years will play a vital role in determining the fate and scope of the plant-forward movement, which is why the time horizon for this analysis is 2030. Let's get started...

Scenario 1: It's not easy being plant-forward

Let's imagine that no major changes occur in the structure or organization of the plant-based market. What comes next?

Hypothetical headline: "Consumers keep expressing need for better plant-centric products and producers can't seem to keep up"

Consumers: Under this "status quo", plant-forward diets will continue growing at a healthy rate, driven primarily by consumers' personal motivations, but eventually reach a plateau (without becoming a majority). Animal and alternative proteins co-exist in supermarket aisles and in households, according to each consumer's personal preferences.

Producers: Plant-centric growth plays out on a trend curve of rapid maturity, meaning that some new and many established brands enter the space and, because alternatives are not technically advanced enough, develop differentiation and build value based mainly on brand and storytelling. Following the initial hype, consolidation puts 3-5 brands, including private label, in control of each major category.

What's in it for me? If at this point you don't yet have a meaningful retail presence, consider other business options, unexplored plant-based categories or new routes to market. For those already in the market, press on the gas pedal!

Scenario 2: Race to the top

Let's imagine that certain companies within the sector develop innovative & proprietary technologies that allow them to achieve a truly viable (organoleptically adequate and price competitive) plant-based or cultivated product. In addition, they are able to build and scale a global brand.

Hypothetical headline: "New Gen Meat, the undisputed leader in the cultivated meat space, displaces Coca Cola as the world's most valuable food brand"

Consumers: Growth in the plant-based market is consumer-driven, maintaining a steady curve that is boosted by relevant innovation and product launches: "perfect copy" plant-centric products or even "better



Image: Unsplash, Devi Puspita Amatha Yahya

than natural" (plant-centric products with an even stronger nutritional profile than their animal alternatives).

Producers: This grants a first-mover's advantage to producers and brands that manage to gain a relevant competitive advantage ahead of others in this space, most likely leading to a less competitive, monopoly or duopoly plant-centric market structure.

What's in it for me? Consider investing in research or start-ups working with proprietary technology, or alternatively developing capacities for a fast-follower strategy.

Scenario 3: Eat your veggies

Let's imagine that governments begin to impose stricter "plant-forward" regulation, through fiscal policy that incentivizes or facilitates production/consumption of plant-based or cultivated products and/or disincentivizes production/consumption of animal products.

Hypothetical headline: "The EU sets a 'meat tax' on processed meat products and red meat."

Consumers: If producers have not yet achieved an offering of amazing plant-based alternatives, consumers will tend to gravitate towards more "vegetable focused" products. Which is to say, demand will be driven less by a "less meat" mentality than by a "more veggie" mentality, leading towards natural and convenient vegetable products, either fresh or semi-prepared (rather than processed).

Producers: Producers that have not achieved a "winning" plant-based alternative will focus on promoting the vegetable components of dishes, launching products that traditionally do not include vegetables with more vegetables (for example, vegetable or legume-based pasta), and looking towards international cuisines with new and attractive plant-forward dishes. Animal meats become further premiumized, as loyal consumers will be willing to pay more for them, and producers will need to demonstrate very elevated animal welfare conditions and strong storytelling.

What's in it for me? Lean into the plant-forward space, that way you'll be eligible to benefit from this type of regulation! Regarding NPD, consider developing formulas that emphasize the vegetable or plant-content as an added value, beyond just plant-based simulation of animal products.



Image: Unsplash, Russ Ward

leads plant-forward diets to grow significantly, even reaching the majority. However, mass adoption of this type of diet also leads to a minority contingent of consumers who reject these products, most likely for their lack of "naturalness", focused especially on cultivated meat.

Producers: Significant demand leads to a dynamic and competitive market, with producers addressing a range of consumer needs through segmentation and more complex and differentiated value propositions: functional, craft, etc.

What's in it for me? Developing or laggard brands can begin laying the foundation for their approach to plant-based, focusing on a broad range of key attributes and differentiation regarding the plant-centric space.



Image: Unsplash, Brooke Lark

Scenario 4: We're all plant-forward

Let's imagine that companies within the sector develop innovative & proprietary technologies that allow them to achieve a truly viable (organoleptically adequate and price competitive) plant-based or cultivated product AND that governments begin to impose "plant-forward" regulation, through fiscal policy that incentivizes or facilitates production/consumption of plant-based or cultivated products and/or disincentivizes production/consumption of animal products.

Hypothetical headline: "Plant-based & cultivated market overtakes traditional animal-based in value and volume."

Consumers: Plant-based alternative products become the "easy" or "win-win" choice: consumers can select the superior or preferred product (taste-wise, due to technological advancements and price-wise, due to regulation) while also having a sense of making consumption choices that contribute to the greater good. This

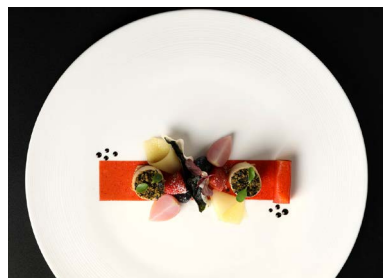
List of top plant-forward restaurants

The plant-forward wave is present in restaurants around the world, both in fine dining and in the most everyday restaurants. Based on the Michelin guide and Tripadvisor, we have made a selection of plant-forward restaurants spearheading this trend in the restaurant industry.

Michelin Star Plant-Forward Restaurants



Eleven Madison Park (New York, USA), Eleven Madison Park (New York, USA), one of the first 3 Michelin-starred restaurants to have an exclusively vegan tasting menu.



King's Joy (Beijing, China) is a three-star Michelin-starred vegetarian restaurant led by young chef Gary Yin.



ONA (Arès, France), Origine Non Animale, was in 2021 the first French vegan restaurant to be awarded a star by the Michelin guide.



Joia (Milan, Italy) is a Michelin-starred vegetarian restaurant that also holds the new Michelin green star.



El Invernadero (Madrid, Spain), holds both a Michelin star and a green star and offers tasting menus where vegetables are the protagonists.

The best plant-forward places picked by consumers



Cosmic Kitchen
(Plymouth, UK),
a vegan bistro run by the
Evan-Gelou twins.



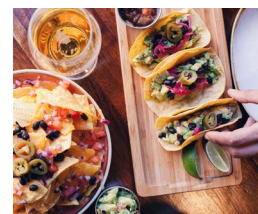
Scoop'n Dough
(Lisbon, Portugal),
specializing in sweets
and ice cream



Twelve Eatery
(Bournemouth, UK),
menu plant-based and
organic menu and brunch
restaurant.



Vegan Beat
(Athens, Greece),
ufast street food with
gyros and hamburgers.



Blu Bar
(Barcelona, Spain),
offers a range of pizzas,
tapas, bowls and sand-
wiches.



Flax & Kale
(Barcelona, Spain),
offers healthy and sustain-
able food with a focus on
the flexitarian diet.



City o City
(Denver, USA)
sources locally and from
their own urban micro
farm.



EFE Macrobiotic World
(Rawai, Thailand)
offers clean & healthy
macrobiotic fare.



The Land of Kush
(Baltimore, USA)
specializes in tasty "on-
the-go" vegan soul food
options.



Plant Miami
(Miami, USA)
is a modern take on plant-
based and eco-conscious,
sourcing their organic
ingredients locally.

Highlighted Sources

Boston Consulting Group (2021) Food for Thought: The Protein Transformation

DuPont Nutrition & Biosciences and IPSOS (2020), Plant-based Meat Alternatives Set to Thrive in the Next Five Years

Euromonitor (2020), Going Plant-Based: The Rise of Vegan and Vegetarian Food

Good Food Institute, 2020 State of the Industry Report: Cultivated Meat

Good Food Institute, 2020 State of the Industry Report: Fermentation

Good Food Institute, 2020 State of the Industry Report: Plant-Based Meat, Eggs, and Dairy

Good Food Institute- Opportunities in Alternative Seafood, June 25-2020

McKinsey (2021), Cultivated meat: Out of the lab, into the frying pan

Nielsen IQ (2019), The F Word: Flexitarian is not a curse to the meat industry

Smartprotein (ProVeg), What consumers want: A survey on European consumer attitudes towards plant-based foods 2021

If you would like to discuss this trend further or
request any additional information, please reach out
to hola@lantern.es

Lantern[■]



**Unlocking growth
to design the future**

T: +34 91 08 08 138
C/San Bernardino, 14 Ppal. C
28015, Madrid, Spain

www.lantern.es