Alt-Protein: Eating away climate change?

AN EUOBSERVER MAGAZINE EXPLORING THE TRANSITION TO A MORE CLIMATE-FRIENDLY DIET
Editor’s introduction
BY ALEJANDRO TAUBER

Just a few years ago, before the world moved on to talk seemingly exclusively about AI, the prevailing hype centred around the potential of alternative proteins – that is, proteins produced from sources other than livestock.

Companies producing meat alternatives from plants, fungi and insects sprouted all over the globe, attracting both consumer and investor interest.

The idea fits in nicely with a rapidly-growing world population needing both more protein and less reliance on animals to remain within our planetary ecological boundaries.

People stuck at home during the first year of the Covid pandemic (ironically enough, caused in part by our reliance on animal meat) were eager to try out new things to cook at home, driving sales of alternative meat products up 60 percent in Germany, for example.

While not a panacea, alternative proteins could provide a more sustainable and less vulnerable source of food for countries by both reducing demand on inputs and localising production.

Which is why we’re dedicating this issue of the EUobserver magazine to alternative proteins, to show the status quo in 2023, the hurdles we need to tackle, and the future opportunities for the EU and the world. Let’s keep up the hype.
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Mycelium food and EU regulation

In the 1960s, among fears of the so-called ‘protein gap’ – the idea that a growing global population would need an unsustainable amount of protein production to avoid malnutrition – researchers at British Petroleum made a remarkable discovery.

By ALEJANDRO TAUBER
Humans have used these metabolic capabilities for thousands of years, in the production of bread, cheese, soy sauce and alcohol, and have eaten the fruiting bodies for as far back as fossil records go.

Humans have used these metabolic capabilities for thousands of years, in the production of bread, cheese, soy sauce and alcohol, and have eaten the fruiting bodies (‘mushrooms’ for non-mycologists) for as far back as fossil records go. But for about a decade, interest in mycelium – the ‘roots’ of the fungus that grow beneath the surface in vast networks – has surged. By growing the mycelium on a specific substrate, and closely managing the nutrient and oxygen supplies, the structural properties of the final product can be tweaked to resemble materials like leather, or food like meat.

In nature, fungi act as mediators of waste. They break down organic matter, i.e. dead things, to grow, and in the process release back nutrients from the deceased matter into the soil.

### Mycelium and Protein Production

#### Agriculture

The mycelium product has to be treated to reduce RNA content, and should not be a top priority to keep food innovation from being smooth regulatory pathways should be free from toxins (such as herbicides or pesticides) and heavy metals. The mycelium product has to be treated to reduce RNA content, and should not be contaminated with other microorganisms.

### Fungi can play an important role in this process. And thankfully, not creating food from oil this time around.

Both investors and startups have told EUobserver that these regulatory hurdles, imposed by the EU through the European Food Safety Authority (EFSA) are both costly for fledgling companies, and slow down the innovation process.

Fungi can play an important role in this process. And thankfully, not creating food from oil this time around.

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### Additional Information

**About Alejandro Tauber**

Alejandro Tauber is publisher of EUobserver, and previously was editor at VICE’s Motherboard, and publisher of TNW, with a background in science and tech reporting.
Healthy people, healthy landscapes: a look into local food systems

Ghent’s policies represent an important idea: cities and their regions can become more connected and promote healthy and sustainable food systems.

By PAULA SOLER
Cities are the biggest polluters, but also the ones who have the upper hand in awarding public contracts for school and hospital meals, managing food waste, etc.

As both experts explain, proposals such as plant-based diets are not only about eating local, healthy, protein-rich food; they are focused on local, healthy, protein-rich and plant-based food. And its potential is there. This is also proven by a study showing that 10 percent of the production of legumes, roots and tubers, as plant-based diets are not only about eating local, healthy, protein-rich and plant-based food.

In this sense, the EU is also working on its farm-to-fork strategy to support member states in their transition towards sustainable food systems. And its potential is there. This is also proven by a study showing that 10 percent of the production of legumes, roots and tubers, as plant-based diets are not only about eating local, healthy, protein-rich and plant-based food.

Lupin – the high-protein legume

Another option that is increasingly gaining ground is lupin, a high-protein legume that, besides being a popular snack in Mediterranean cuisine, can also be used as a substitute for soya or as a base for creating plant-based meals.

“Lupins can be established as an alternative protein crop, capable of promoting socio-economic growth and environmental benefits in Europe,” concludes the article ‘The future of lupin as a protein crop in Europe’, published in the scientific magazine Frontiers in Plant Science.

However, its cultivation is not yet sufficient to guarantee a steady supply to the food industry, the piece also points out.

Lupin is mainly harvested on the oceanic continent, which accounts for three-quarters of total production, while Europe accounts for less than one-fifth.

In 2020, the world’s top ten producers included EU countries such as Poland, Germany, Greece, and France. On a smaller scale, it is gaining market share in other member states such as Denmark, where from 2015 to 2018 alone its production increased by more than 50 percent.

“Lupins have high commercial potential, especially in markets where consumers are focused on local, healthy, protein-rich and plant-based food,” notes one of the working documents of the European project PROTEIN2FOOD, focused on the development of high quality protein food.

In this sense, the EU is also working on its farm-to-fork strategy to support member states in their transition towards sustainable food systems. And its funding is currently boosting projects such as FoodSHIFT 2050, which have opened nine living labs across Europe to research citizen initiatives that can be scaled up, respond to social and environmental challenges, and be economically sustainable in the future.

Their lab in Poland is creating a model that allows young people to create social gardens within cities, where they could implement circular economy solutions or plant-based diets.

The one in the Greater Copenhagen area of Denmark aims to create greater cooperation between urban and rural areas in the region, in order to transform current food systems into more environmentally sustainable ones.

“Lupins have high commercial potential, especially in markets where consumers are focused on local, healthy, protein-rich and plant-based food”

EATING AWAY CLIMATE CHANGE? ALT-PROTEIN

They are not the only ones. Other European projects such as SchoolFood-4Change work on an equally important part: education and social awareness of a new food culture.

Some changes are small. In Sweden, when the youngest pupils were presented with a ‘vegetarian’ option in their canteens, they turned it down. However, when the options were listed simply as one and two, instead of vegetarian and conventional, the children started to choose the meat-free option.

“We are also working on how to present these healthier options to the children, so they can become an equally conventional choice,” explains Tasse. ICLEI is the coordinator of the project which, in addition to introducing healthier diets in schools, educates new generations about the origin and impact of everything they eat.

And although each initiative is different, this and the previous ones have one thing in common: the seed (the concept) is planted from the bottom (or early on), and grows or scales up to where it can become a reality: be it at the community, local, regional or national level.

EATING AWAY CLIMATE CHANGE? ALT-PROTEIN

About Paula Soler

Paula Soler is EUobserver’s social affairs correspondent. She previously worked covering economic and financial affairs at Spanish newspaper El Confidencial.
Plants get boost from new food security worries

In Europe, affordability of food rather than access to food is a concern. Plant-based diets could make the entire system more sustainable, including prices.

By ESZTER ZALAN

The war in Ukraine brought into sharp focus that food security is not a given. Not even in Europe.

Countries highly-dependent on imports of Ukrainian and Russian cereals, like Egypt, Turkey and Middle East, faced shortages — which Russian propaganda has used to undermine the West’s sanctions policy.

While the shocks to the food system caused by the war mostly impacted countries outside of Europe, there is increasing concern about affordable food in the EU too.

Food prices have continued to rise, despite inflation dropping for a second consecutive month in December 2022, according to Eurostat, the EU’s statistical agency.

The inflation of food prices in the EU was 18.2 percent in December, with the highest price rise seen in Hungary at nearly 50 percent, Lithuania with 33.5 percent, followed by Estonia with 30.8 percent.

"Food security effects are minor, in an international perspective. [...] Availability of food in the EU is not impacted. Food-price inflation has been high, so affordability is critical for the poorest households," Rico Ihle from the Wageningen University in the Netherlands told MEPs last October.

He added that the EU was able to boost its wheat exports, contributing to smoothing the global scarcity caused by Russia’s invasion of Ukraine — with both countries being important exporters.

"The EU has been shown in simulations of the World Bank to be the largest global winner in terms of gains in export revenues due to the explosion of prices, but it is a net loser due to massive energy imports," Ihle explained.
These concerns over food security, which are not only exacerbated by the war but also by the increasingly extreme and unpredictable weather caused by climate change, underpin arguments for adjusting to a more plant-based diet.

**Meat = Heat**

The global production of food is responsible for a third of all planet-heating gases and the use of animals for meat causes twice the pollution of producing plant-based foods, a major study has found.

Animal agriculture’s impact on food security and climate change are expected to grow, if plant-based diets do not take on. The UN estimates that more people will consume meat as millions will adopt a middle-class, urbanised lifestyle along with its consumption habits.

Asia accounts for 40 to 45 percent of total global meat production, having taken over Europe and North America as the dominant producers, according to a UK government report on food security. The UN’s Food and Agriculture Organization (FAO) expects global meat production to increase by 13 percent over the next 10 years.

It remains to be seen if that trend would be impacted by growing prices and climate concerns. Europeans are tending to decrease meat consumption, but not by much, and very slowly.

About 1.5kg of meat is consumed per week by the average citizen of the EU-27, according to FAO data, which is twice the global average, Greenpeace argues. The EU Commission expects that the EU meat per capita consumption will drop from 69.8kg in 2018 to 67 kg by 2051. Beef and pig meat consumption is projected to go down in the next decade, but poultry and sheep are expected to grow. The EAT-Lancet diet, which sets out a healthy diet for a sustainable food system, recommends that people eat no more than 300 grams of meat per week by 2050.

The EU Commission data also show that around two-thirds of EU cereal production and 70 percent of oilseed production is intended for animal feed. Since 2012, there is no specific support for protein crops, and import tariffs are set at zero, the EU Commission said.

“As meat and energy intensive products such as greenhouse-grown vegetables become more expensive, consumers could look for alternatives, such as plant proteins, and seasonal, locally-available, products,” said Melchior Szczepanik from the Polish Institute of International Affairs, sketching out what he called a “positive scenario”.

“Smaller meat production would contribute to lower emissions and make it possible to use more cereals for food,” he said, adding, however, that larger farmer’s associations are now even less likely than before the war to accept pledges that would require them to change farming practices for the sake of sustainability.

Geneviève Pons, director general of Brussels-based Europe Jacques Delors think-tank warned that “we cannot look at the EU in isolation.”

She said global responses on food security should include keeping trade open, and better managing the utilisation of crops, addressing the “competition between biofuel production, feeding animals and feeding people”. “We need to encourage alternatives to animal proteins,” Pons said.

**Veggies for security**

Replacing only 20 percent of meat with microbial protein could more than halve the rate of deforestation and reduce carbon emissions related to cattle farming by 2050, a study published in Nature found. It would also halve emissions from the global food system.

And moving to a plant-based diet in the EU and the UK could replace almost all the production losses from Russia and Ukraine, argued research in Nature Food.

Leiden researcher and co-author of that study, Paul Behrens, said plant-based options are “vitally important” to food security in Europe.

Behrens argued that consumers need to be taken onboard. “It is about giving options to people so they are not trapped,” he said.

Behrens argued that farmers need to be taken onboard. “It is about giving options to people so they are not trapped,” he said.

EU member states, particularly Austria and France, have called for an EU-wide protein strategy by the commission. Countries primarily want to reduce their reliance on plant protein imports, as for example 90 percent of the soy needed for EU animal feed is imported.

The commission is preparing a review of its protein policy. EUobserver was told by the commission’s spokesperson. “The aim is to increase food security while reducing the impact on the environment and climate both in the EU and globally,” the agriculture commissioner Janusz Wojciechowski told the European Parliament in February. The executive plans to deliver this review in the beginning of 2024.

**About Eszter Zalan**

Eszter is from Budapest, Hungary. She joined EUobserver in 2015. She reported on conflict and war zones for Nepszabadsag, the largest Hungarian daily, for several years, and has also covered Hungary for Agence France-Presse. At EUobserver, she covers issues around European democracy, rule of law, and populism. She is the co-founder of Eurologus, a Hungarian blog focusing on EU affairs.
The EU says a ‘novel food’ is food that has not been consumed to a significant degree by humans in the EU before 15 May 1997.

The last on that list, the mung bean, is a base ingredient for plant-made eggs produced by US firm Eat Just. In 2020, Eat Just submitted an application to get mung bean listed as an EU novel food. Two years later it was approved.

Before mung bean got the European Commission’s stamp of approval, it first had to go through a scientific review. That review is carried out by the Italian-based agency, the European Food Safety Authority (EFSA). “The team that is working on this has grown considerably,” confirmed EFSA spokesperson, Edward Bray.

The EFSA has received some 200 applications for novel foods since the EU introduced new rules in 2018. “That’s more than we received in the whole period from our foundation in 2002 up to this date,” adds Bray.

This scientific review can take up to nine months. In some cases, it may take longer. But Bray said that is usually because of missing data from the companies.

Antarctic Krill oil, protein extract from pig kidneys, magnolia bark extract and the mung bean. All these and many others are on a list of approved novel foods for sale on the European market.

By NIKOLAJ NIELSEN

EATING AWAY CLIMATE CHANGE?
Some 19 applications are pending, for instance, on cannabidiol (CBD) foods due to a lack of data.

“CBD is quite a specific case. We put all of the applications on hold at the same time. Our assessment of available studies showed data gaps regarding the safe use of CBD as food,” said Bray.

EFSA scientists say they need more data to determine the effect of CBD on the liver and gastrointestinal tract, for instance. But once EFSA gives a product the green light, the European Commission usually follows through.

**Novel food regulation**

The Brussels-executive says the 2018 novel food regulation means innovative foods can get onto the market quicker. And it defines novel food as food that had not been consumed to a significant degree by humans in the EU before 15 May 1997.

Prior to 2018, applicants would first go to a member state for approval and then to EFSA. The new regulation created a centralised authorisation system.

“An e-submission system has been developed to facilitate the online submission of novel foods applications,” said a European commission official.

Firms can also retain an exclusive right to sell their approved novel food ingredient for up to five years. After that, anyone can market it.

It means the process is more simple and efficient, said the official. But not everyone agrees.

Among them is Swedish liberal MEP Emma Wiesner. “I’m coming from a traditional farmer’s party, but I’m also an environmentalist,” said the 30-year old, who also holds a masters degree in science and engineering.

Wiesner is the European Parliament’s lead MEP on a new European Protein Strategy. “This will not be a strategy about human intake of animal protein. That’s not what it’s about. It’s not a farmer strategy,” she said.

Instead, she says the strategy seeks to increase protein crop production in Europe for use in novel technologies and novel foods.

This includes plant-based and alternative protein for human consumption, as well as animal feed. Compared to novel food technology in Singapore and Israel, Europe is lagging behind, she said.

Wiesner says getting authorisation and permits takes too much time in Europe. “So that can really hamper a lot of cool projects and new technologies,” she said.

Belgian MEP Tom Vandenkendelaere, who is working on the European Protein Strategy on behalf of the centre-right European People’s Party (EPP), drew similar observations.

“Providers of novel food continue to face too many administrative barriers to get their products on the market,” he said. For Vandenkendelaere, the 2018 regulation on novel foods already needs an update.

Do novel foods pose an existential threat to traditional farming? Not really, says Vandenkendelaere.

“I see novel foods mainly as an opportunity to get proteins from new sources and strengthen our diversity in food,” he said.

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**About Nikolaj Nielsen**

Nikolaj was born in Denmark but spent a better part of his life in Belgium, France and the United States. He joined EUobserver in 2012, where he primarily covers migration, human rights and transparency issues. His reporting for EUobserver has taken him to Algeria, Belarus, Egypt, Lebanon, Moldova, Russia, Transnistria, Turkey, Uganda, Ukraine and off the Libyan coast.
In 2016, the European Institute of Innovation and Technology (EIT) – an independent EU body established in 2006 – founded EIT Food, a Knowledge and Innovation Community (KIC) focused on tackling problems related to food and food production.

The organisation, like all other KICs, brings together stakeholders ranging from industry to civil society to work together on funding projects, companies and individuals that show promise in helping to solve issues like malnutrition, waste and climate change. It’s funded in part through the European Commission, and in part through contributions from industry members.

In 2018, the organisation appointed Andy Zynga as CEO, in his first non-profit gig of his career. EIT Food sees alternative proteins, or ‘protein diversification’, as Zynga prefers to call it, as a promising avenue to address some of the shortcomings of our current food systems.

EUobserver spoke to Zynga about EIT Food’s mission, the promises of protein diversification, and the shortcomings of existing regulation in helping innovation in the EU flourish.

EUobserver: So what brings you to EIT Food, Andy?

Zynga: I’ve been in this role for something like four and a half years. After spending my whole career building or turning around businesses in the for profit sector, this is my first time in the non-profit. I’m excited because this role gives me a chance to have an impact on an entire ecosystem plus a whole industry and make doing something that has tangible value for both people and the planet. And I think at this stage, this is really what we need.

Tell me something about EIT Food’s mission.

EIT Food is a European Union co-funded non-profit that aims to transform the food system. What we aim to do is to make people and the planet healthier by creating impact in five particular areas; the reduction of the risk of non communicable disease through malnutrition, the reduction of the risk of obesity (with a focus on childhood obesity), reduction in the negative impact of the food system on the environment to focus on greenhouse gas emissions and water, a better circularity of the food system so as to reduce food waste and food loss, and then lastly, improvement in the conditions for better trust of consumers in the food system.

Ambitious.

It’s basically the pact we have with the citizens of Europe for the funds that we’re getting from the EU Commission. In effect, we identify the challenges in the system that need to be solved across four areas in which we work, one of them being innovation or product development, then also education, business creation and public engagement.

And how has that been going?

In the very beginning, in the original consortium, we had 50 partners. So these are fee-paying members in order to build a trusting relationship across that network. This network of partners has grown to about 100 over the years. We have many different partners, from farming cooperatives, to processors, firms like Pepsi and Danone and DSM to retailers like Colruyt in Belgium. We also work with some consumer organisations and NGOs like the Good Food Institute (GFI). We basically assembled all the different actors in the food system that can help us to create that impact that we owe to the citizens of Europe.

Let’s talk about alternative proteins, and how EIT Food has seen the space evolve.

Although we noticed over the years that while the interest in these sources of protein rose for a while, there’s still work to be done in communicating to the consumer that these options are actually a good source of protein.”

Andy Zynga
people will try things and through that education of sources, and just by mere fact of so we see this development as a diversification, because ‘alternative’ suggests replacing something else. What we believe is that animal meat itself as a protein source will most likely not go away. Now plant-based proteins, we’ve seen a very strong investor interest in that. There’s also algae, another area that’s been growing. And, of course, one of the strong ones now is fungus and such like, so mycoproteins and precision fermentation – everything that’s growing in a bio-reactor, also looks like a very interesting way to go forward. Then there are also edible insects, and I’m not going to leave them out of the picture. Although we noticed over the years that while the interest in these sources of protein rose for a while, there’s still work to be done in communicating to the consumer that these options are actually a good source of protein. So we see this development as a diversification of sources, and just by mere fact of more being available at the supermarket, people will try things and through that we believe that the mix of protein sources will actually expand. People try a little bit of this, a little bit of that, so that’s what we see now.

What are the main advantages of people moving to diversifying their protein diet? Protein diversification has several really important knock-on effects that are important to those five impacts that I mentioned in the beginning. One of them is of course climate action. I mentioned we try to avoid water use, and if you look at plant based protein, GFI is saying that plant based protein uses 99 percent less water. So that’s one, but secondly, also for human health. If you look at the EAT-Lancet report about planetary health diets, it shows that having more diversity in protein sources helps people’s health. Then there’s the environment and more diverse crops. If you’re not focusing just on those seven or eight main crops, but you’re diversifying that as well. And of course, it’s also got a very positive impact on the economy, because you have this growth of all these new startups that are trying things.

Can you give me some examples? Most recently, I saw a company called Cocoon Biosciences, that is growing growth factors for alternative proteins by injecting something in cocoons of some kind of larvae. We see those companies spring up like mushrooms — some of them actually literally working with mushrooms! There’s a lot of growth, a lot of interest of the investor community, but also by consumers, importantly, we see they’re very interested in protein diversification.

Now one of the limiting factors I’ve heard from many companies in the alternative protein space is that EU regulation is quite strict or slow-moving when it comes to diversification of proteins? There are a few. We most recently issued a white paper on protein diversification in which we make a few recommendations. One of them is that the regulatory approval for novel foods could be maybe a little bit faster, or so we hear from startups.

I most recently spoke to a startup from Hamburg making a lab-grown seafood alternative. So I asked them if they are being impacted by Germany. And he said, ‘we’d love to because we’re right here, but we cannot because we don’t have regulatory approval.’ So they’re going to Singapore, and then they go to the States. Those are the two countries that are actually quite advanced. We’re falling behind a little bit, is what I’m trying to say. And I don’t know what that means in terms of measures, from where I’m sitting. Maybe the teams in EFSA need to be bolstered!

Secondly, what I also hear is from startups that the EFSA when they submit applications, there are no hearings. And that’s what we hear is happening in the US. Startups submit applications, and oftentimes, the complexity of the matter, scientifically-speaking, is such that just looking at the paper is maybe not enough. I have to stress, I don’t know if hearings are actually taking place, but if they’re not, then maybe they should.

We also think that funding is a little bit behind in this part of the world, so we’re certainly talking to some European Union institutions about maybe setting up a fund of funds that we can be involved in for agri-food.

And is there anything else that might help? The EU legal framework for environmental food labelling. That’s a really interesting avenue for Europe because it leads to food majors reconfiguring their supply chains to have less environmental impact. That is one I’m really excited about and all of us here at EIT food. The whole environmental food labelling is an amazingly impactful piece of legislation, that’s going to lead to major impacts on the food production side, which will also impact plant-based protein sources.

There’s not a lot of time left until 2030. I think there’s some real urgency to scale up some of these diversified protein sources to mitigate the impact meat has on the environment. Mind you, the meat producers, they’re also working very hard on finding alternatives, reducing methane emissions and stuff like that. But like I say, it’s not up to any of these individual little things. It’s the whole mix of the whole basket of things.

The one thing that I haven’t seen is any kind of larger-scale analysis of the economic impact that having a diversified protein strategy for the EU might have in terms of, let’s say, bolstering exports or creating labour. Right, that’s an interesting point, to measure the economic impact of certain of these steps. I think that would probably ease the decision-making in some places. I’m hearing from some companies in the B2C also looking at that, you know, so I think they’re, they’re also actually coming up with a few of these impacts.

All in all, where do you see the alt-protein, or protein diversification going in the longer run? Every couple of years we create a so-called trust report. Tracking the trust of consumers to us is very important, and I think it’s important to the rest of the community as well. In the 2021 Trust Report we found that only about 37 percent of Europeans are going to adopt new innovations, indicating that the food system has a lot more to do in educating consumers in promoting trust in these diverse protein sources. On the positive side, the GFI found in a little bit of research, in advance of this conversation, they queried 4,000 consumers across Europe and 60 percent say, more alternatives to meat products need to be found. There seems to be a very strong interest.
How ‘Big Meat’ lobbies Brussels to keep carnivore status quo

“In China, they’re building skyscrapers of pigs,” says Greenpeace. And in Brussels, the Big Meat lobby is spending millions to stop so-called ‘vegan radicals’ from shaping EU policy.

By ANDREW RETTMAN

“It’s not about banning meat — that’s not the point,” says Marco Contiero, who works in Brussels on agriculture for Greenpeace, an NGO and leading advocate of more plant-based food.

“But in China, they’re building skyscrapers of pigs. It’s insane. That’s where things are headed, so we need to change direction,” he added.

Contiero grew up in Padua, in northern Italy, where meat is a time-honoured part of native cuisine. His favourite recipe is canederli (a kind of meatball) and he and his family eat organic meat once every 10 days or so, he told EUobserver.

But for all the Paduan’s love of traditional food, the scientific verdict is already in: eating meat once or twice a day — the way many Europeans do and Chinese people aspire to — is ruining the planet due to the methane, ammonia, and nitrogen emissions of the dystopian-scale farming required to feed our appetite.

And that’s on top of ruining your health and causing animal suffering.

If you thought oil and tobacco were influential, Big Meat is in a league of its own.

While Big Pharma firms spend some €36m a year in Brussels, according to Corporate Europe Observatory, Big Agri spends over €50m.
New Zealand, the Dutch Meat Association trade bodies such as Beef and Lamb. Most other meat-producers lobby the EU Brussels. It spends up to €500,000 per year. Of these in Brussels with combined spending of more than €1m a year — an Italian sausage group, the Istituto Salumi Italiani Tutelati, spends €500,000 alone. But that’s just the beginning. Big Pharma companies, which make the chemicals and medication that enable industrial farming, such as Bayer and BASF, are broadly pro-meat. Big Agri also generally lobbies for EU diets to stay the same. Big Pharma firms spend some €36m a year in Brussels, according to Corporate Europe Observatory, an NGO. Big Agri’s interests are themselves farmers or landowners, despite the “blatant conflicts of interest” that creates, Contiero noted. The biggest political group in Brussels, the European People’s Party, has also “clearly taken a decision that the farming and rural community are an important electoral base”, he added. They represent the EU establishment and their influence on Europe’s power structures is as old as its aristocracies. “Europe’s principle landowners are some of the same noble families that date back to feudal times. For more than 1,000 years these same people have had direct contact with power,” Contiero said. Meanwhile, on the other side of the world, China opened its first vertical (26-storey) pig farm last November. But if that’s not the direction you want the EU to keep following as populations grow, then you’re labelled a “vegan radical” in today’s culture wars, Contiero said. “It’s not about losing something we love. That’s really not the point. It’s about improving the quality of meat in European diets.” Marco Contiero

It’s been proved in studies by the Intergovernmental Panel on Climate Change (IPCC), Oxford University in the UK and Wageningen University in the Netherlands. And it’s been written about ad nauseam by the World Health Organisation and in prestigious titles such as The Lancet, a British medical journal. That makes the ‘Big Meat’ lobby in Brussels just as toxic as Big Tobacco or Big Oil and climate-change denial. But if you thought oil and tobacco were influential, Big Meat is in a league of its own. Only one of the world’s top 10 meat producers, Brazil’s Cargill, has an office in Brussels. It spends up to €500,000 per year. Most other meat producers lobby the EU via trade bodies such as Beef and Lamb New Zealand, the Dutch Meat Association, or the Danish Bacon and Meat Council. There are about 40 of these in Brussels with combined spending of more than €1m a year — an Italian sausage group, the Istituto Salumi Italiani Tutelati, spends €500,000 alone. But that’s just the beginning. Big Pharma companies, which make the chemicals and medication that enable industrial farming, such as Bayer and BASF, are broadly pro-meat. Big Agri also generally lobbies for EU diets to stay the same. Big Pharma firms spend some €36m a year in Brussels, according to Corporate Europe Observatory, an NGO. Big Agri spends over €10m. “All of industry suddenly goes up in arms if anyone says there’s a scientific problem with meat,” Contiero said. Taken together, the meat-axis message to EU officials, diplomats, and MEPs is that there would be economic devastation and famine if Europeans switched to plant-based foods. Just like Big Tobacco and Big Oil, they “greenwash” their sector via minor investments in sustainability, while at the same time paying scientists-for-hire to attack the IPCC or Lancet findings in industry-funded media. And it’s working. Most MEPs in the European Parliament’s agricultural committee are trying to water down an industrial-emissions directive that would impose new restrictions on cattle farmers and smaller pig and poultry producers. And a revision of the European Commission’s “promotion policy”, which dictates what kind of food it can advertise, has been blocked for over a year, meaning it’s still paying for projects such as the 2020 ‘Become a Beef-atarian’ campaign.

The lobbying is working not just because of the PR millions or the substance of pro-meat propaganda, which is easy to debunk. One Big Meat line-to-take, for instance, is that the Ukraine war means the EU should protect vulnerable meat producers for the sake of food security. But numbers show the war has a minimal impact on the sector — the EU uses 38.2 million tonnes of wheat a year for animal feed, but imported just 17 million tonnes of this from Ukraine before Russia invaded. The lobbying is working because it’s preaching to the converted. Several MEPs on the agricultural committee are themselves farmers or landowners, despite the “blatant conflicts of interest” that creates, Contiero noted. The biggest political group in Brussels, the European People’s Party, has also “clearly taken a decision that the farming and rural community are an important electoral base”, he added. They represent the EU establishment and their influence on Europe’s power structures is as old as its aristocracies. “Europe’s principle landowners are some of the same noble families that date back to feudal times. For more than 1,000 years these same people have had direct contact with power,” Contiero continued. The entrenched sense of entitlement is why when dairy farmers vandalise EU buildings in Brussels in booze demonstrations, the Belgian police treat them with kid gloves, he claimed. And Europe’s rightwing populists are even more carnivorous, pushing an ideology that bakes meat-eating into the same pie of identity politics that also contains nationalism, xenophobia, and homophobia.

Woke culture wars

In Contiero’s home country, the populist government of prime minister Giorgia Meloni proposed a ban on lab-grown meat in March — in the name of protecting the Italian way of life. “They portray new ideas [such as plant-based food] as an attack on traditional lifestyles, using the same rhetoric that hammers migrants or LGBTI people,” he said.

Europe’s principle landowners are some of the same noble families that date back to feudal times. For more than 1,000 years these same people have had direct contact with power.”

Andrew Rettman

Andrew Rettman is EUobserver’s foreign affairs and defence correspondent.
After the alt–protein hype: a venture capitalist’s perspective

To learn about the financing of alternative protein companies, EUobserver spoke to Marie Asano, who heads the food and nutrition team at the European Circular Bioeconomy Fund, which (despite its name) is an independent ‘dark green’ venture capital fund — focused on innovative companies that aim to bring bio-based foods to the general public.

BY WESTER VAN GAAL
Most of us by now have heard of meat alternatives, but lately they haven’t been in the headlines quite as much as they were a few years ago.

Founding a company in a market that is both relatively new and past the initial hype can be challenging — especially in the EU, where legislation is slow, and public funding often has to be mirrored by private investors.

Is the hype over?
If you mean raising huge amounts of money based on exorbitant three-digit million valuations, then yes: the hype is over.

What does that mean for the industry?
We’re excited because that means the market is maturing. That means more predictability in terms of performance. In German, there’s a saying that ‘everybody cooks with water.’

In the end, every investor — whether it’s venture capitalists or private equity — looks at the cold hard numbers. We look at revenue. We look at the potential for revenue generation. We look at profitability, and then we look at how realistic the chance is to achieve gains at the time of projected exit.

EU legislation is infamously slow. So how does this influence the industry, compared to, for example, the US?

The legislation most relevant for us is European novel food regulation, and indeed the pathway for approval for companies to commercialise their product still takes about two years, which has proven surprisingly stubborn.

In the United States, the process is faster, but there a founder is completely liable if something turns out to be toxic, which is not the case in Europe. It’s a different way of thinking.

How could the EU do better in the financing space for alt-foods?
Greater access to grants so founders can build their companies without giving up control. That or free access to infrastructure. Anything that takes the weight off of having to raise €10m-€30m just to build a pilot plan for something that may or may not be successful. That would also make my job easier because founders have less incentive to inflate the value of their company to raise money and still keep control of their company.

You’re an ‘Article Nine’ fund. Explain what that means?
That means we are a very ‘dark green’ fund under the EU’s sustainable finance disclosure rules, which quantifies how green and sustainable you are as a financial service. There is a whole rainbow of venture capital funds out there: We only invest in technologies that reduce emissions and social and environmental impact.

Let’s get stuck in the alt-protein stuff: what are you focusing on?
We prioritise investments in bio-based technologies. Nature has a wonderful way of recycling carbon. Specifically, we focus on novel proteins and novel materials. If you break down food and taste to the molecular level, it becomes the science of what people like eating. How does it taste? What’s the chewiness? How does it perform under heat? Does it gel? What is the stuff that excites you?

We invested in lupine proteins, a new upcoming raw material, and marine proteins like algae. I’m excited about precision fermentation, which means producing specific cells from mycelium [the root system of mushrooms] or novel bacteria.“

Marie Asano

How does this improve the food system that we have?
What’s cool with precision fermentation is that it can be localised. So instead of contributing to deforestation in Brazil to build soy fields, it becomes possible to produce protein locally in a region that would not typically be a proteins producer. Plus, mushroom cells are cool, right? You don’t have to say: hey, what you’re eating now is made from bacteria or bugs, essential for something to become acceptable for people. I don’t want to eat insects. No way!}

I’m excited about precision fermentation, which means producing specific cells from mycelium [the root system of mushrooms] or novel bacteria.”

Marie Asano

About

Wester van Gaal

Wester is a journalist from the Netherlands with a focus on the green economy. He joined EUobserver in September 2021. Previously he was editor-in-chief of Vice, Motherboard, a science-based website, and climate economy journalist for The Correspondent.
The plant-based meat market is starting to sizzle in Europe

Drivers of this plant-based shift tend to be young, liberal, educated, female, city-dwelling, and environmentally-conscious, but not necessarily vegan or vegetarian

By BJÖRN JÖHANN ÓLAFSSON

Meat alternatives aren’t going anywhere. According to a new market report commissioned by the Good Food Institute Europe and compiled by Nielsen IQ, the European plant-based food market is now worth over €2bn, having grown every year since 2020.

The report, which analysed markets in 13 EU countries, primarily western and central Europe, also found that plant-based dairy is the most widely consumed alternative product, with the animal-free seafood category growing the fastest. Germany, the UK, and Italy are the leading consumers, while the Netherlands, Germany, and Sweden spend the most per capita.

This news shouldn’t come as a surprise to anyone who’s kept their eye on grocery store aisles. A decade ago, vegetarians were limited to limp lentil burgers or tofu nuggets. Now, meat abstainers are swimming in options – Spanish brand Heura boasts vegan chorizo in multiple flavors, landmark British fast-casual chain Gregg’s sports vegan sausages, and the Netherlands is home to over an array of over 60 plant-based companies.

Still, it’s unlikely that plant-based meats will surpass animal protein anytime soon – across the continent, animal farming still dwarfs meat substitutes by about 100 to 1 – but the increasing growth of the plant-based market is nothing to scoff at.

The category growth comes at a time
when meat consumption is stagnant or falling in many European countries. During 2022, plant-based meat alternatives grew one percent in unit sales while animal meat dropped by four percent.

In some European countries, veggie proteins are already starting to displace meat. Germany, with its affordable and convenient plant-based options, has convinced plant-based products, providing another PR hurdle for alternative protein brands to overcome.

Plants, even processed plant-based products, don’t commit the same climate sins. In a meta-analysis of 26 peer-reviewed studies, researchers at the University of Bath found that plant-based products emitted up to 120 times less greenhouse gases as compared to beef and up to 10 times less when compared to pork. They also use far less land, energy, and water.

The plant-based meat companies that are thriving are doing so because they can successfully relay this message to eco-conscious consumers. Heura, a popular Spanish brand, is particularly adept at tapping into this – their billboards and ads frequently tout the carbon footprint of meat to directly appeal to consumers’ ethical sensitivities. And so far, the message seems to be working – the Barcelona-based company reported revenue growth of 80 percent in 2022.

The healthiness of plant-based products is also a major draw – nearly 60 percent of Europeans who eat plant-based products are doing so for the supposed health benefits. Swapping red and processed meat out for plant-based alternatives can be helpful for reducing risk of heart disease and cancer.

Critics of plant-based meats often point to the long ingredient lists and decry the products as ‘ultra-processed.’ And while it’s certainly a stretch to call plant-based burgers a ‘healthy’ food, most health professionals would argue that they’re some-what healthier than the foods they’re intended to replace – after all, few people are eating burgers for the health benefits.

Still, the meat industry often runs ads pointing out the artificial additives in plant-based products, providing another PR hurdle for alternative protein brands to overcome.

It’s not all rosy for the industry. Marketing of the plant-based products have resulted in unexpected challenges, like what they can even call their products. While the European meat industry failed to ban the words ‘veggie burger’ in 2020 – claiming the term misled consumers – they’re still debating language. Plant-based milks must market themselves with vague phrases like “oat drink” or “soy milk alternative.”

Cost is still a major hurdle for those on the fence. In almost all EU countries, plant-based products still cost more than their meat counterparts, sometimes by large margins. In Spain, a veganchorizo will cost you about a euro more, while a classic British mince will cost an extra €4 ($4.5) a kilo.

Plant-based meat companies are still chasing after price parity – the economic tipping point when a soy-protein burger is the same cost or cheaper than a regular hamburger patty. Last year, the Netherlands made headlines when it was revealed that plant protein alternatives were now universally cheaper than meat. It should be no surprise that, even though only one percent of their population is vegan, the Dutch have been reducing their meat consumption for over 10 years now. Most countries can’t claim the same.

Inflation is helping to close the price gap between imitation and animal meat. Within the last few years, meat’s costs have been hiked up by about 15 percent, while veggie burgers’ costs barely budged. Most analysts believe price parity will occur throughout Europe sometime this decade — although the jury is still out on exactly when.

While the pea and soy burgers have come a long way in the flavour department, not all of them are tasty enough to sway consumers. Some products were rushed to market, eager to cash in on the plant-based craze before R&D had finished creating an enticing product. Many consumers are unlikely to ever try any soy burgers, associating them with gross, processed food.

Some people will likely never become convinced. For many, meat offers a sense of comfort and tradition that will never be replicated by soy protein. Plant-based products consistently poll poorly among older, rural, and conservative EU residents.

But within a few years, another contender will likely arrive on the European alternative protein scene: cultivated meat, an innovative and sustainable food grown from the cells of animals in bioreactors.

Cultivated meat still isn’t approved for sale in the EU, so don’t expect to see lab-grown chicken breasts on your local menu anytime soon. But the industry’s progress in Singapore, Israel, and the United States, and the UN’s Food and Agriculture Organization’s cautious endorsement of the products’ safety earlier in 2022, indicates that a cultured meat factory will likely land in Europe within a few years.

Even though the new-fangled invention is already facing pushback from Italian lawmakers, the product polls surprisingly well, especially among carnivorous men. The product resembles animal meat far more than a pea-based Beyond Burger in taste and texture, which means it may be able to capture audiences who aren’t convinced by plant-based imitations.

But until lab-grown meat hits shelves, plant-based alternatives will likely continue to sizzle, finding a home within a changing Europe.
I believe precision fermentation is the most important environmental technology ever developed. It might be all that now stands between us and Earth systems collapse.

By GEORGE MONBIOT

Precision fermentation is a refined form of brewing, a means of multiplying microbes to create specific products. It has been used for many years to produce drugs and food additives. But now, in several labs and a few factories, scientists are developing what could be a new generation of staple foods.

The developments I find most interesting use no agricultural feedstocks. The microbes they breed feed on hydrogen...
The food ‘footprint’

The first is to shrink to a remarkable degree the footprint of food production. One paper estimates that precision fermentation using methanol needs 1,700 times less land than the most efficient agricultural means of producing protein: soy grown in the US. This suggests it might use, respectively, 196,000 and 157,000 times less land than the least efficient means: beef and lamb production. Depending on the electricity source and recycling rates, it can also enable radical reductions in water use and greenhouse gas emissions. Because the process is contained, it avoids the spillover of waste and chemicals into the wider world caused by farming.

If livestock production is replaced by this technology, it creates what could be the last major opportunity to prevent Earth systems collapse, namely ecological restoration on a massive scale.

By repurposing the vast tracts now occupied by livestock (by far the greatest of all human land uses) or by the crops used to feed them – as well as the seas being trawled or gill-netted to destruction – and restoring forests, wetlands, savannahs, wild grasslands, mangroves, reefs and sea floors, we could both stop the sixth great extinction and draw down much of the carbon we have released into the atmosphere.

The second astonishing possibility is breaking the extreme dependency of many nations on food shipped from distant places.

Nations in the Middle East, north Africa, the Horn of Africa and Central America do not possess sufficient fertile land or water to grow enough food of their own.

In other places, especially parts of sub-Saharan Africa, a combination of soil degradation, population growth and dietary change cancels out any gains in yield. But all the nations most vulnerable to food insecurity are rich in something else: sunshine. This is the feedstock required to sustain food production based on hydrogen and methanol.

Precision fermentation is at the top of its price curve, and has great potential for steep reductions. Farming multicellular organisms (plants and animals) is at the bottom of its price curve: it has pushed these creatures to their limits, and sometimes beyond. If production is distributed (which I believe is essential), every town could have an autonomous microbial brewery, making cheap protein-rich foods tailored to local markets. This technology could, in many nations, deliver food security more effectively than farming can.

There are four main objections.

The first is “Yuck, bacteria!” Well, tough, you eat them with every meal. In fact, we deliberately introduce live ones into some of our foods, such as cheese and yoghurt. As for disgusting, take a look at the intensive animal factories that produce most of the meat and eggs we eat and the slaughterhouses that serve them, both of which the new technology could make redundant.

The second objection is that these flours could be used to make ultra-processed foods. Yes, like wheat flour, they could. But they can also be used radically to reduce the processing involved in making substitutes for animal products, especially if the microbes are gene-edited to produce specific proteins.

This brings us to the third objection. There are major problems with certain genetically modified crops such as Roundup Ready maize, whose main purpose was to enlarge the market for a proprietary herbicide, and the dominance of the company that produced it.

But GM microbes have been used uncontroversially in precision fermentation since the 1970s to produce insulin, the rennet substitute chymosin and vitamins. There is a real and terrifying genetic contamination crisis in the food industry, but it arises from business as usual: the spread of antibiotic resistance genes from livestock slurry tanks, into the soil and thence into the food chain and the living world. GM microbes paradoxically offer our best hope of stopping genetic contamination.

The fourth objection has more weight: the potential for these new technologies to be captured by a few corporations. The risk is real and we should engage with it now, demanding a new food economy that’s radically different from the existing one, in which extreme consolidation has already taken place.

But this is not an argument against the technology itself, any more than the dangerous concentration in the global grain trade (90 percent of it in the hands of four corporations) is an argument against trading grain, without which billions would starve.

The real sticking point, I believe, is neophobia. I know people who won’t own a microwave oven, as they believe it will damage their health (it doesn’t), but who do own a woodburning stove, which does. We defend the old and revile the new. Much of the time, it should be the other way around.

I’ve given my support to a new campaign, called Reboot Food, to make the case for the new technologies that could help pull us out of our disastrous spiral. We hope to ferment a revolution.

About George Monbiot

George Monbiot is an environmentalist, author, and columnist for The Guardian.

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Why your next meat dish may have been nowhere near an animal

Europe is now looking whether cell-based meat should be on the menu

By CLAIRE TURRELL

Plump sun-dried tomatoes, springy pasta and crispy chicken... To the uninitiated, this looked like a regular bistro dish, but what’s different about this bowl of pasta, is that the chicken didn’t originate from a farm, but a lab. Huber’s Butchery in the upmarket enclave of Dempsey, Singapore, is the first butcher in the world to sell cultivated meat.

Today I was getting a glimpse of the future. On 19 December 2020, the Singaporean government gave the US company Eat Just approval to sell cultivated meat to the public. Eat Just’s Good Meat chicken has been served at hotels, private members’ clubs and street food stalls, but by serving it at this bistro, this is the first time it has been sold by a butcher.

Chef Chong Jun Xiang, who worked at the private members club 1880 in Singapore, is now tasked with introducing this next generation ingredient to diners. The R&D chef is usually working at a kitchen in Bedok above Eat Just’s manufacturing facility, but today he is whipping up a vegetable orecchiette topped with crispy cultivated chicken in the kitchen of Huber’s bistro ready for me to test.
This ingredient is so rare it was enough to make one New York chef take a 19-hour flight to Singapore to try it. In the short time Good Meat chicken has been on sale in Singapore, it has already gone through three iterations – a spongy looking chicken nugget, a larger more fibrous piece of chicken and now the chicken is three times the size, with the same fibrous meat you would find on a chicken thigh.

When Chong presented me with the dish, the pasta was al dente, the sun-dried tomatoes and broccoli gave the dish a punch of colour, and the sliced deep-fried chicken had a golden outer layer. When I cut it with a knife, the fibres tore apart like farmed chicken, and when I first tasted it, I could have been fooled that this was like any farm chicken I’d eaten. There was an aftertaste, but if this is what Good Meat has achieved in this small amount of time, who knows where it will be in even 12 months?

The reason why it tasted like real meat, is because it is. Chong said he had as many questions as anyone else when he was told about cell-based meat. “Initially I was sceptical, [but] when you understand how it’s made it really is just a piece of chicken,” said Chong.

Unlike brands such as Impossible Foods and Beyond Meat, which create plant-based alternatives, Good Meat chicken is real meat. This cell-based meat or cultivated meat, as the industry prefers to call it, is created by taking cells from animals, placing them in a bioreactor (like a microbrewery) to create real meat.

Source: Eat Just

Good Meat chicken is real meat. This cell-based meat or cultivated meat, as the industry prefers to call it, is created by taking cells from animals, placing them in a bioreactor (like a microbrewery) to create real meat

Source: Eat Just

While cultured meat can’t yet be sold in Europe, it is a hot topic in Brussels.

While cultured meat companies working on everything from cell-based fish sticks to foie gras are also launching across Europe, waiting for legislation to change. There’s Bluu Seafood from Germany, which is creating cell-based fish sticks; Gourmey from Paris creating cell-based foie gras; and Miraai from Switzerland, which is focusing on beef. Dutch companies Meatable and Mosa Meat (where Mark Post now works) are working on pork and beef.

While European companies can’t yet sell cultured meat to the public, it hasn’t slowed the continent’s rate of investment. While the United States is the biggest investor in cell-based food (€1.54bn), followed by Israel (€537.91m), the Netherlands comes in third spending €140.45m, and the UK and France are also in the top 10.

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In preparation for cell-based meat being sold in Europe, Mosa Meat has also not only launched the world’s largest cultivated meat facility in Maastricht, Netherlands, but joined with partners in Singapore. Maarten Bosch, Mosa Meat CEO said: “The ability to produce our beef on two continents will also reduce
the carbon footprint associated with shipping meat across the globe."

As a small island-state, Singapore can pivot faster than most countries. But as it imports 90 percent of its food, food security has long been on its radar. The pandemic couldn’t have helped but give it a sharper focus and the country has set itself the goal of producing 30 percent of its food by 2030, which means that it has become a hub for food tech.

For cultivated meat to be successful, the Singaporean public needs to be on board. A YouGov survey in 2018 found that while 81 percent of Singaporeans said they probably wouldn’t eat artificial meat, a third of millennials said they would happily consume it. Yet, two months after Good Meat started selling cultivated chicken in Singapore, Singaporean cell-based shellfish company Shiok Meats surveyed the public in March 2021, and found that 78 percent of Singaporeans said they were open to eating cell-based seafood.

To remove the ‘yuk’ factor associated with cell-based food, Eat Just founder Josh Tetrick said that the best is to get people to try it. Tetrick is choosing to make a small loss on each $18 dish that he sells, just so he can get it into the hands of consumers. Tetrick disrupted the food industry with a plant-based egg, but he said that with so many meat-eaters, you need cultivated meat as well to really move the needle. "Plant-based meats have done a really solid job of getting tens of millions of consumers to move from conventional to something that is a lot better. But we really think that is a ceiling to plant-based meat. I really wish I didn’t believe that, but I do," said Tetrick.

While cell-based meat is impressive, UK-based dietitian Meaghan Greenwood said that cell-based meat may not contain everything that we need for human health. "As the technology for producing cell-based meat continues to develop, it is likely that any nutritional differences between cell-based and conventional meat will be minimised."

André Huber, executive director of Singapore’s Huber’s Butchery has followed Good Meat’s journey from the start. It wasn’t until the second-generation Swiss butcher tasted the third version of the cultivated chicken, he agreed to sell it in his restaurant. "The texture [of the nugget] was too mushy. It wasn’t as fibrous as chicken. But the latest version is almost 90 percent like real chicken," said Huber.

Huber hopes that cultivated chicken will work alongside conventional meat and people in the future can use both in their diet. "We are selling it once a week [in the bistro] and going to ramp it up to twice a week," said Huber. "Hopefully, when the new factory is ready and churning out the orders, we might sell it over the butchers counter as well."

While Eat Just’s plans are big, the supply is holding them back. Huber’s bistro only has enough stock to serve a handful of diners. When the Singapore facility opens, it is expected to produce tens of thousands of pounds a year of meat, but this still won’t be enough to service a population of 5.9 million people that has chicken rice as one of its national dishes.

Though something needs to be done for a global population that is expected to rise from eight billion to 9.5 billion by 2050, said professor Benjamin Horton of the Earth Observatory of Singapore.

"By 2050, 70 percent more food will be needed to fulfil the demand of the growing population."

Benjamin Horton

By 2050, 70 percent more food will be needed to fulfil the demand of the growing population. "The world population will need cultured meat as well to really move the needle. "Plant-based meats have done a really solid job of getting tens of millions of consumers to move from conventional to something that is a lot better. But we really think that is a ceiling to plant-based meat. I really wish I didn’t believe that, but I do," said Tetrick.

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