

# 2020 STATE OF FOODTECH TRENDS

OCTOBER 2020 EDITION



DigitalFoodLab

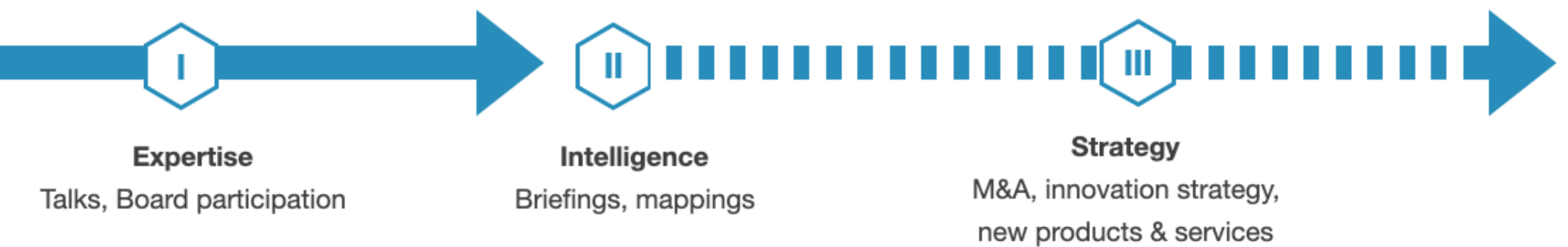
# HELLO,

## We're DigitalFoodLab.

**DigitalFoodLab** is the **European FoodTech** insight and strategy consultancy.

We are the **experts** on FoodTech startups and disruption of the food, beverage and retail industries.

We help our corporate and startup clients to achieve sustainable and **higher growth by acting on the best innovation opportunities.**



*“DigitalFoodLab’s team approach to innovation is unique and has helped us very efficiently to understand the evolution of our sector, to anticipate and move accordingly towards our objectives.”*

Pascal Vegh, Coca-Cola E.P., Directeur Digital

*“DigitalFoodLab is the place to go if you want to learn about FoodTech and startups trends globally. The team helps us to stay at the forefront of information on the global ecosystem and make the right strategic choices.”*

Anthony Bourbon, Feed, Founder & CEO

# CONTENTS

<b>Introduction</b>	4
<b>FoodTech - définitions</b>	7
<b>AgTech &amp; Foodscience</b> - the fundamental bricks of our food system are becoming more sustainable and productive	
1. New sources of protein in the pipe (air protein, enhanced crops)	9
2. Urban farming shall prove its worth or face the consequence of disenchantment	16
3. Traceability and transparency	21
<b>Delivery &amp; retail</b> - the shift from the consumer fetching for the food to the food being delivered to him	
4. Delivery startups (old and new) are challenging retailers on groceries	28
5. Delivery robots, drones and autonomous delivery cars have had a sandbox during lockdowns	35
<b>Foodservice</b> - The future of the restaurant is coming fast	
6. Cloud kitchens and the reinvention of restaurant delivery	42
7. Robots and smart fridges are reinventing QSR and the cafeteria	48
<b>Foodscience &amp; coaching</b> - tomorrow's meal will be more sustainable and personalised while looking the same as today's	
8. Plant-based protein is now mainstream, where will it go from there?	54
9. Lab-grown dairy, fish and meat are coming, but how soon?	59
10. Packaging and food waste: a paradigm shift from management to avoidance through technology	64
11. A new generation of direct-to-consumer (DTC) brands	70

# INTRODUCTION

## FOODTECH & COVID-19

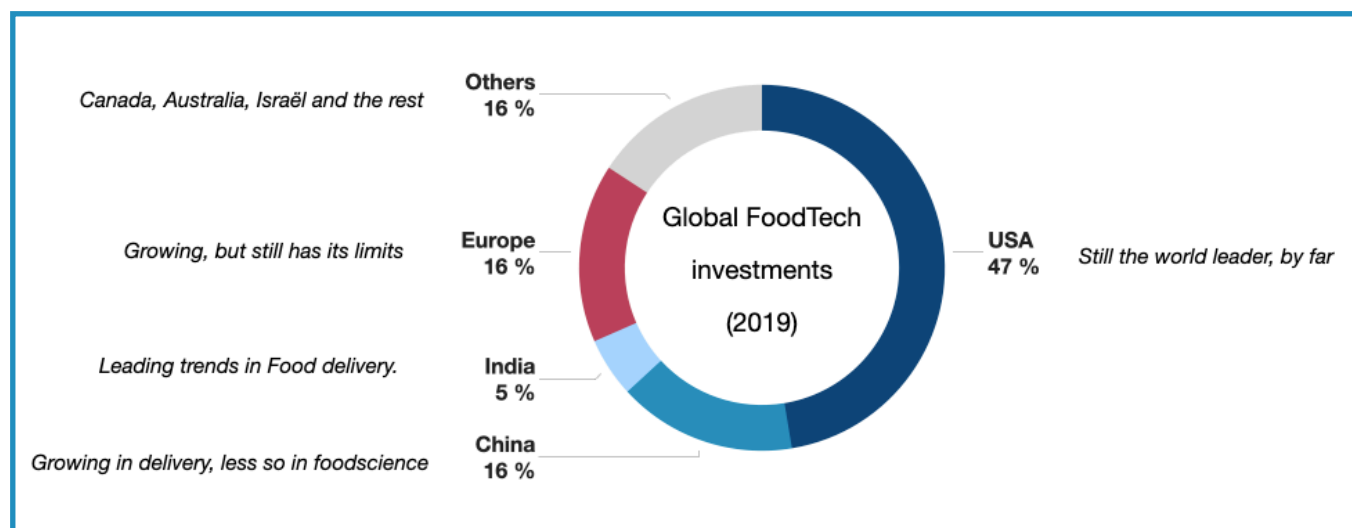
Let's start with the elephant in the room. As with all other ecosystems, FoodTech has been highly impacted by COVID-19. However, it is mostly in positive ways.



- **Foodscience** startups growing through paid acquisition and those selling their products through foodservice have suffered. Others, notably plant-based startups, have surged and proven their worth during the pandemic.
- **AgTech** startups have not been affected per se. Urban Farming startups have been reinforced by the growing desire for more sustainable and local foods.
- **Coaching** startups have not been highly impacted. Personalisation remains a challenge without many answers. Transparency and traceability will return as key challenges in the incoming months.
- **Retail** startups are not developed enough in FoodTech for major changes to be observed.
- **Delivery** startups have been impacted the most. Restaurant delivery startups have suffered (and still are). Opposite, the ecosystem working around groceries has benefited and may become a serious challenger of traditional retail.
- **Foodservice** startups focused around services for restaurants are obviously in bad shape, and some have had to seriously reduce their workforce to face the crisis. Cloud kitchens and virtual restaurants have been reinforced as an alternative to the traditional restaurant opening some slots to delivery.

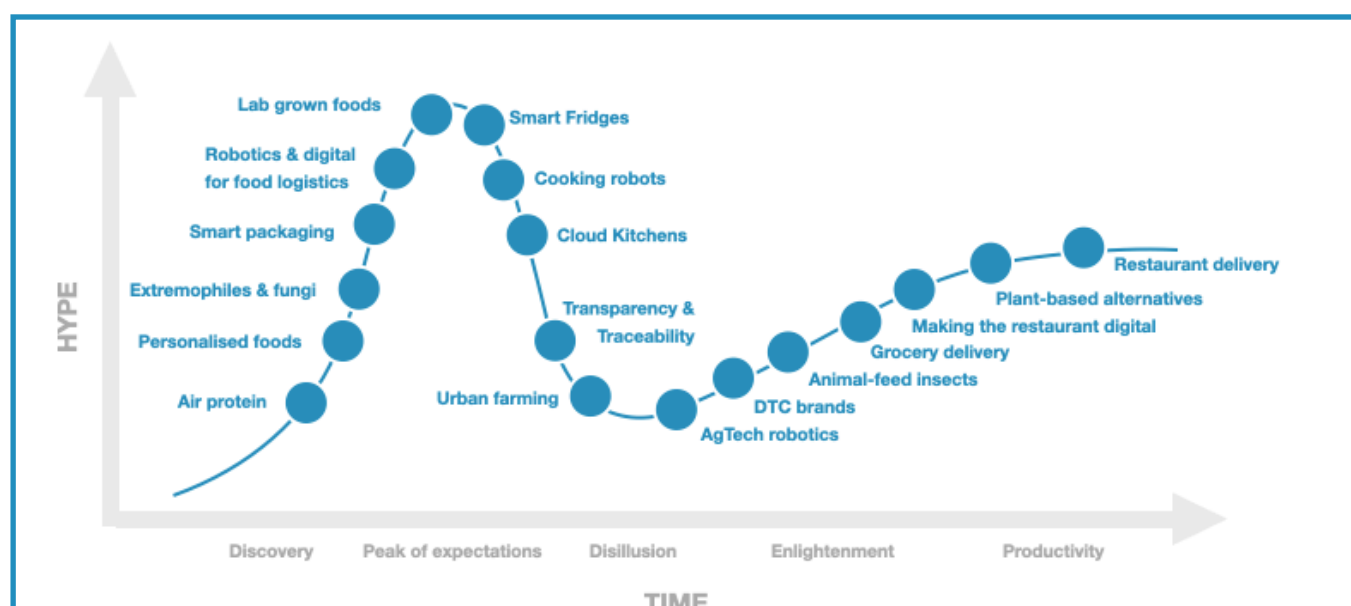
## WHERE IS FOODTECH HAPPENING?

The first point is that there is not a unified “FoodTech ecosystem”, there are many different sub-ecosystems in various places. The main hub for FoodTech remains in the US. However, other areas have a specific interest, as shown in the graph below of the distribution of investments in FoodTech startups.



As shown in the graph, looking for innovation in the US is not enough. Outside the US, FoodTech main territories are in Europe (France, UK, the Netherlands and Germany for the most part), India (for delivery and products innovations), China (mostly for retail). In the rest of the world, Israel, Canada & Australia may be the most exciting places to consider.

## WHAT ARE THE KEY TRENDS?



*This mapping showcases the top FoodTech trends and how we map their evolution from discovery to productivity.*

We have mapped the most relevant FoodTech trends on two axes:

- Hype: how much hype is there on the technology or trend (i.e. how many positive press or social media mentions)
- Time: meaningful tech trends tend to evolve around 6 phases from technology trigger (discovery), a peak of expectation (everyone is talking about it without having seen anything), disillusionment, enlightenment (when profitability and mass use seem reasonable expectable) and the plateau of productivity (when it has become common and profitable).

## FOODTECH - DEFINITION

*The six categories of FoodTech are close to the food value chain from farm (AgTech) to fork (Foodservice for restaurants, Foodscience for CPG products) and distribution (Delivery, Retail and Coaching).*

### **AGTECH**

Startups disrupting agriculture. They come up with solutions to improve farming output and quality using drones, sensors and farm management software. AgTech is also about new farm products, next-generation farms and urban farming.

### **FOODSCIENCE**

Startups developing new food products answering the need for more transparency, health and environmental concerns. Products range from market innovations to radical disruptions using revolutionary ingredients.

### **FOODSERVICE**

Startups reinventing the hospitality industry. They improve the way HoReCa businesses are managed today. They also create the conditions for the restaurant of the future with robotics and cloud kitchens.

### **DELIVERY**

Startups answering the delivery challenges in the food industry, with home delivery of groceries, restaurant meals or meals prepared in their kitchens

### **COACHING**

Startups answering the questions “is my food good for me?” and “what should I eat?”. These services target the final customer and help him to have a better view of his food purchases and intakes to reach his personal goals.

### **RETAIL**

Startups developing solutions for the food retail industry, from the digitalisation of the supply chain to a better in-store shopper experience.

# AGTECH & FOODSCIENCE

## THE FUNDAMENTAL BRICKS OF OUR FOOD SYSTEM ARE BECOMING MORE SUSTAINABLE & PRODUCTIVE

1. New sources of protein in the pipe (air protein, enhanced crops)
2. Urban farming shall prove its worth or face the consequence of disenchantment
3. Traceability and transparency

### ONE YEAR IN AGTECH & FOODSCIENCE

COVID-19 and its consequences are somewhat of a boon for these categories of startups. They could be the answer for a greater desire for food autonomy (or at least less dependency in long stretched value chains).

In a longer view, they may also be the providers of the fresh local and quality produces that urban dwellers are craving for.

### MORE SUSTAINABILITY

Outside of the autonomy that urban farms may provide, they also share a common cause with all the startups working on new source of proteins: they answer the need for a more sustainable agriculture. By reducing the inputs and the need for water, they have the potential, at scale, to reduce the impact humans have on their environments.

This will also require more traceability and transparency all along the value chain with customers getting more and more anxious about the food they eat.

### MORE PRODUCTIVITY

This will not please everyone, but a shift is happening after a decade of experimentation. Indeed, as mentioned above, we expect a shift from the “nice-to-have” urban farms demonstrators to large, scalable and productive (which means profitable) farms.



# I - NEW SOURCES OF PROTEIN IN THE PIPE

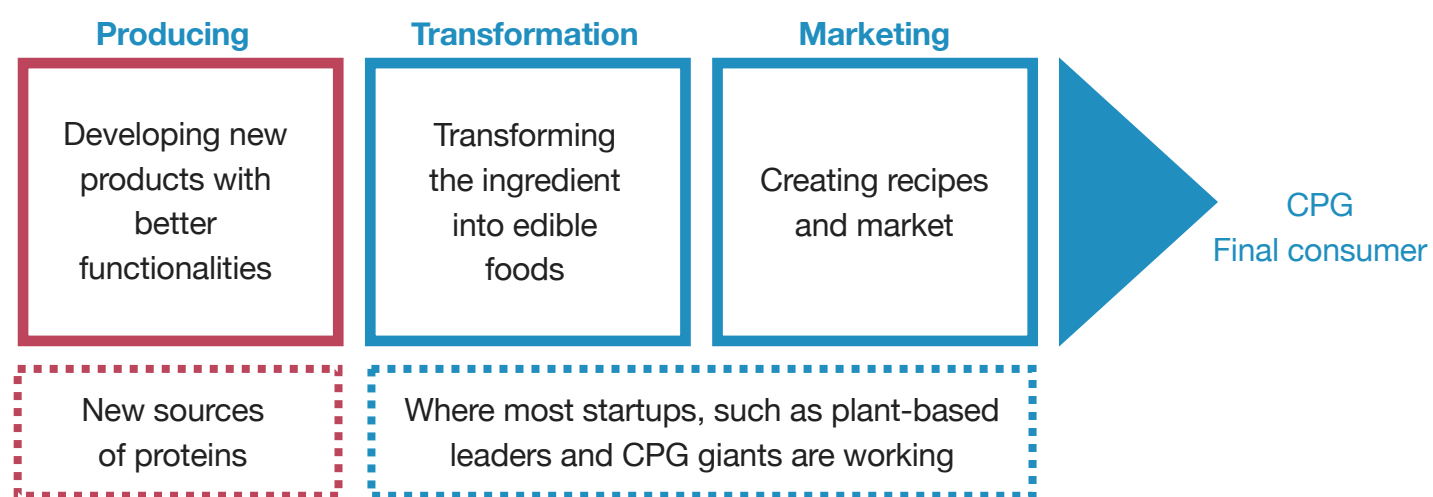
Most of the entrepreneurial energy and most of the investments in alternative proteins are concentrated around mimicking meat, fish and dairy as we know it, either through plants (see chapter X) or by growing it in labs (see chapter XI). These consumer-facing companies have underlined the increasing need for reliable and sustainable sources of proteins.

This leads to a new and growing segment of startups, which has been dedicating its efforts to develop completely new sources of proteins. For the first time this year, we have decided to branch it out from plant-based and lab-grown proteins and consider it as a standalone “AgTech” trend. Indeed these startups don’t target the final consumer but other producers that will themselves transform the proteins in final consumer products.

We will explore three sub-segments:

- Air protein startups
- Startups working on enhancing the level of protein in crops
- Engineered super proteins

## STRUCTURING THE VALUE CHAIN

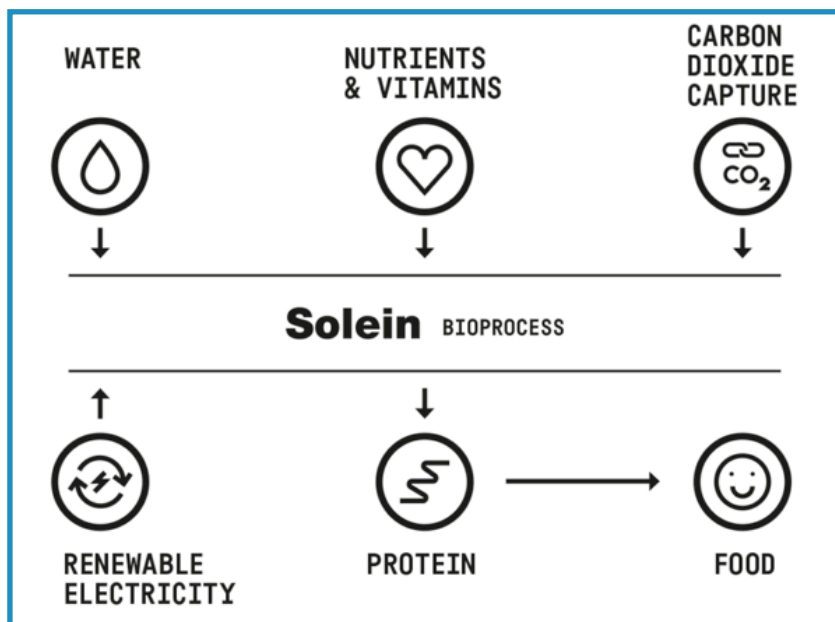


*If most technology-driven startups initially tend to think that they will develop new ingredients, transformation capabilities and branding power, they often reduce their scope to one of the three areas. This chapter focuses on the often-ignored first segment of startups working on creating new and better sources of proteins.*

## 1- PROTEIN OUT OF THIN AIR - CONCEPT

While looking fairly magical, the production of proteins from the carbon dioxide, oxygen and nitrogen naturally present in the air is serious.

The output is a protein powder that can be supplemented and then transformed into food products such as meat replicates. Only a handful of startups are working on this technology. Many challenges related to profitability and scalability remain. It will take a couple of years (and more probably a decade) to overcome them.



*Solar Foods' solein production steps and components.*

*As explained in the graph, the process requires only natural resources such as water and electricity. Additionally, to transform the captured carbon into food, nutrients and vitamins have to be added.*

This, in turn, does not tell how the product will be received on a regulatory level. Here, the approach for [Deep Branch Technologies](#) is interesting; they target the fish feed market rather than the human protein market. We can compare this approach to insect protein startups. While human-oriented products received the buzz, it is the more discreet animal feed companies (such as Ynsect and Innovafeed) that have developed the most.

*Quite interestingly, Air Protein, the US startup working on this technology has immediately focused its efforts on marketing. It demonstrated samples (see opposite picture) of meat replicate made with its protein.*



## BETS FOR THE POTENTIAL OF AIR PROTEIN

Air protein could be a great answer to the protein gap, starting first by animal feed and then maybe for human consumption.

It could reach maximum profitability if combined with carbon dioxide schemes (such as the one of ClimeWorks shown in the picture). Carbon shall be captured in cities centres or at the outputs of factories where concentration are high. Combined with an eventual carbon tax, the process would be profitable.



### 1- PROTEIN OUT OF THIN AIR - STARTUPS TO FOLLOW

#### AIR PROTEIN™

Located in the US, Air Protein' goal is to develop protein-enriched foods.



Deep Brank, located in the UK works with polluters to transform the carbon dioxide into fish food.

#### SOLAR FOODS

Based in Finland, Solar Foods has already raised \$2.8M and is one of the most advanced startups in this field.

### 1- PROTEIN OUT OF THIN AIR - IN EUROPE



#### GOOD

Europe hosts two of the leaders in this new field and many schemes to subsidise such disruptive technologies has a good hand.



#### OPPORTUNITY

This technology could be positive for Europe's tech ecosystem and image if:

- used as a tool to promote a generation of new green+tech startups that bring value to the market;
- well-marketed to explain to local consumers and the world that the continent's innovators can be truly disruptive.

## 2 - ENRICHED CROPS - MORE PROTEIN IN YOUR VEGGIES

One of the main goals plant-based startup is to increase the level of proteins in their product as plants have a lower ratio of proteins compared to animal-based products. Therefore, most of the plant-based alternatives are highly processed products due to the need to extract a high ratio of proteins from plants (another explanation to this level of processing is the need to create more “meat-like” structure, something that 3D-printing that we talk about in chapter VIII could help with). **One answer could be to “develop” crops with a better protein ratio.**

Most of the plants we eat today are human-made evolutions of antique crops developed by breeding and selection. Startups are now working to fasten this process through bio-engineering and machine learning. These non-GMO processes use bio-technologies to sequence DNA, big data and machine learning to identify the best matches.

Another non-GMO technique is the use of the recent discovery (2012) of the gene-editing CRISPR-CAS-9 technique. Very briefly, it can be summed up as cutting a piece of interesting DNA to substitute it to a less desirable one. Researchers have now mastered this technique to “find and replace” genes. Startups in this domain are already testing crops (pea, wheat) with a protein ratio up to 40%! In the US, where it doesn’t count as GMO but as “genetically editing organisms” (without requirements for labelling), some products have already reached the shelves.

### 2- ENRICHED CROPS: CRIPR & CROSS-BREEDING - STARTUP TO FOLLOW



Israel - \$18M raised

Equinom develops a high-yield sesame with a lower footprint and pea varieties that have a 40% higher ratio of proteins.



US - \$75M raised

Caribou is using Crispr in various domains, among which agriculture in order to create crops with high-protein profiles.



US - \$129M raised

Inari aims to build the “seed foundry” with the ability to recreate genetic diversity and create a feedback loop directly connected to farms.

## 2- ENRICHED CROPS: CRIPR & CROSS-BREEDING - IN EUROPE



**BAD**

As CRISPR is assimilated to GMO in Europe, experimentation has been made all but impossible on the continent.



**OPPORTUNITY**

With many biotech companies focused on food and world-class giants in seeds, Europe could be a leader in these domains. For now, these giants are only active in the field through their international subsidiaries or as investors in Israeli, Canadian and American startups.

## 3 - INSECTS FOR ANIMAL FEED - CONCEPT

Almost a decade old, the insect ecosystem has evolved from its focus on human nutrition toward animal feed. In the last couple of years, some of them have moved from experimentation to mass production.

### WHEN AG AND FOODTECH BECOMES INDUSTRY PLAYERS

Insects for animal feed is one of the few areas where Agtech startups have to develop industrial facilities. This has many benefits on the ecosystem as a whole, as it physically shows that startups can be more than gig job providers.



## 3 - INSECTS FOR ANIMAL FEED - STARTUP TO FOLLOW



France - \$172M raised

Founded in 2011, Ynsect is part of a first generation of startups, now leaders in animal feed based on insects protein. It focuses on aquaculture and pet food.



Bulgaria - €5M raised

Founded in 2017, Nasekomo is part of a second wave of animal feed startups focused on insects. It focuses on South-East EU markets

### 3 - INSECTS FOR ANIMAL FEED - IN EUROPE

#### GOOD

Europe is leading in this domain in quite a surprising way. As many ventures were created to focus on human foods made for protein, many countries banned these products as untested and potentially unsafe. This has made many startups move toward B2B and then animal feed.

#### OPPORTUNITY

Applications could be multiple, and maybe, in a couple of years, these startups will be able to pivot again toward human ingredients. In the meantime, the opportunities in animal feed and pet foods are numerous.

### 4 - ENGINEERED SUPER PROTEINS - CONCEPT

As this ecosystem of “new proteins” is getting wider, our efforts of classification can’t avoid a “miscellaneous part”. With “engineered super proteins”, we are talking about all the proteins discovered either in nature and benefiting of extraordinary properties or with the use of machine learning techniques.

These startups are, as others in this chapter looking to use their protein powders to provide the industry with a source of protein that will be able to clean its labels. While ramping up their production and reducing their cost, they are offering their products as providing other “functional benefits” such as neutralising the taste (a common issue in plant-based products using pea protein) or sugar reduction.



*Beside is a picture of Yellowstone. Nature’s Fynd identified there an extremophile fungus, rich in protein. Due to the extreme conditions of pressure and the lack of nutrients, this organism has developed an ability to multiply by using very few resources. The startup’s goal is to replicate this process and to create a very affordable source of proteins.*

#### 4 - ENGINEERED SUPER PROTEINS - STARTUP TO FOLLOW



US - \$83M raised

Founded in 2013, MycoTechnology is using the power of fungus for various products, among which ClearTaste a bitter blocker.



US - \$113M raised

Founded in 2012 Nature's Fynd's founder has discovered an "extremophile" fungal at Yellowstone during its PhD. They are now building a plant to mass produce it.

#### 4 - ENGINEERED SUPER PROTEINS - IN EUROPE



Few European startups are active in this domain with most of the R&D in the US and in Israël.



As for crops enrichment, European companies invest in US-based startups (Nature's Fynd has been funded by Danone for instance). This could create motivation, for European entrepreneurs to invest their energies in this promising field.

# GOT A QUESTION?



## CONTACT US!

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