



# Global FoodTech Landscape Overview 2021 Q4



October 2021

## Contributors



# Global FoodTech Landscape Overview 2021 Q4

## Table of Contents

<b>Introduction</b>	2
<b>Global FoodTech Landscape Overview 2021 Q4 MindMap</b>	3
<b>Executive Summary</b>	4
• Methodology and Approach	5
• Key Findings	6
<b>Global FoodTech Landscape Overview</b>	7
• FoodTech Industry Landscape Ecosystem	8
• Global FoodTech Market Overview	9
• FoodTech Companies by Funding	11
• Top-30 FoodTech Companies by Funding	12
• Top Companies and Investment Deals	13
• FoodTech Investors' Regional Distribution	14
• Top Investors and Investment Deals	15
• Dynamic of Investments by Category	16
• Raised Capital Evolution	17
• FoodTech Startups	18
<b>Upcoming Events and Industry Influencers</b>	19
<b>FoodTech Companies and Business Case Studies</b>	24
<b>FoodTech Industry during COVID-19</b>	53
<b>Trends and Obstacles</b>	57
<b>Predictions and Conclusions</b>	66
<b>Disclaimer</b>	75

## Introduction

Developed by Deep Knowledge Analytics, the new **Global FoodTech Landscape Overview 2021 Q4** report provides a comprehensive overview of the FoodTech sector, providing qualitative indicators, such as key findings and a general overview of the industry, and quantitative indicators such as the distribution of FoodTech companies by country and of investors by region; the distribution of companies by category and by number of employees; the top 10 FoodTech investors; and the top 10 deals by investments in 2020.

**FoodTech is an emerging sector** exploring how technology can be leveraged to improve efficiency and sustainability in designing, producing, choosing, delivering, and consuming food. The FoodTech Industry is developing rapidly and includes more than 5,000 startups globally.

**AgTech is the largest sector** by number of companies, as a more “mature” market. AgTech is an emerging economic sector that can completely reshape global agriculture, dramatically increasing the productivity of the agriculture system while reducing the environmental and social costs of current production practices. The technologies used in AgTech include field sensors, drones, farm management software, automated machinery, and water & fertiliser management solutions.

# Global FoodTech Landscape Overview 2021 Q4

AgTech

Food Science

Companies - 400+  
Investors - 800+  
Accelerators, Hubs and  
R&Ds - 15

GreenTech

Food Marketing

Delivery

Retail

Others

Food Service

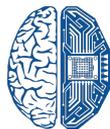
Food Processing

Companies

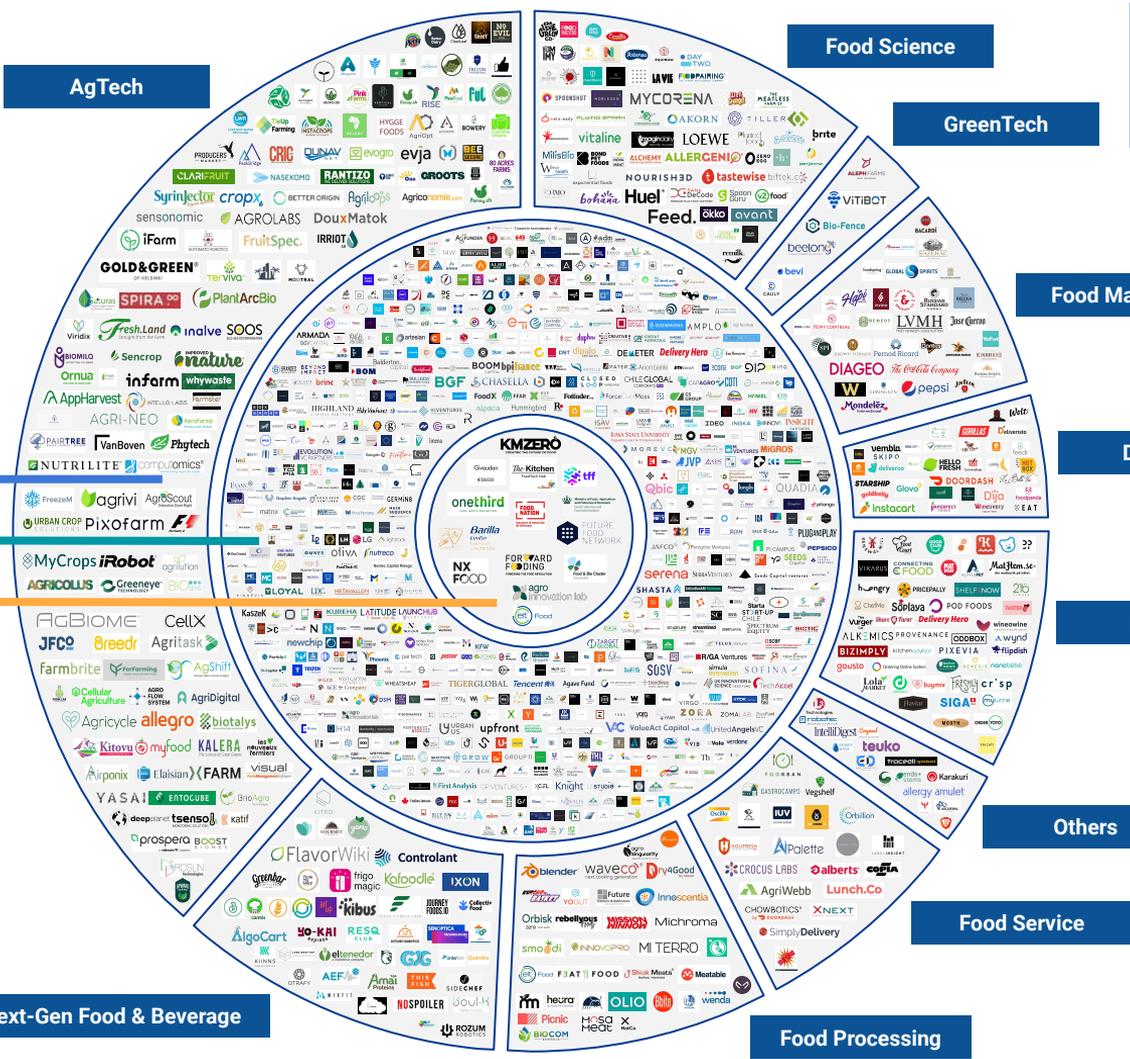
Investors

Accelerators,  
Hubs and R&Ds

Next-Gen Food & Beverage



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# Executive Summary



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# Methodology and Approach

## Methodology

In the course of the study, more than 400 FoodTech companies and nearly 900 investors were analyzed. These categories ranged from FoodTech companies such as AgTech, Food Marketing, FoodScience, FoodService, Delivery, Retail, Food Processing, Food and Beverage Tech, GreenTech, and Others. The highlighted technologies are: Advanced Analytics, AI, Automation, Big Data, Blockchain, E-Commerce, Intelligent Data Analysis, IoT, Machine Learning, Robotics, Smart Waste Disposal and Recycling, Software and Platform, Supply Chain Management, Sustainability Solutions, and Others.

## Approach

Relying on various research methods and analytics techniques, the analytical provides a comprehensive overview of the FoodTech Industry. This approach has certain limitations, especially when using publicly available data sources and conducting secondary research. Deep Knowledge Analytics is not responsible for the quality of the secondary data presented herein; however, we do our best to eliminate the risks by using different analytics techniques and cross-checking data. Please note that we did not deliberately exclude certain companies from our analysis. Nor was it due to the data-filtering method used or difficulties encountered. The main reason for their non-inclusion was incomplete or missing information in the available sources.

### Data Sources

Media  
Overview

Industry  
Specialized  
Databases

Publicly  
Available  
Sources

Industry  
Reports and  
Reviews

### Applied Research and Analytics Methods

Descriptive  
Analysis

Mixed Data  
Research

SWOT  
Analysis

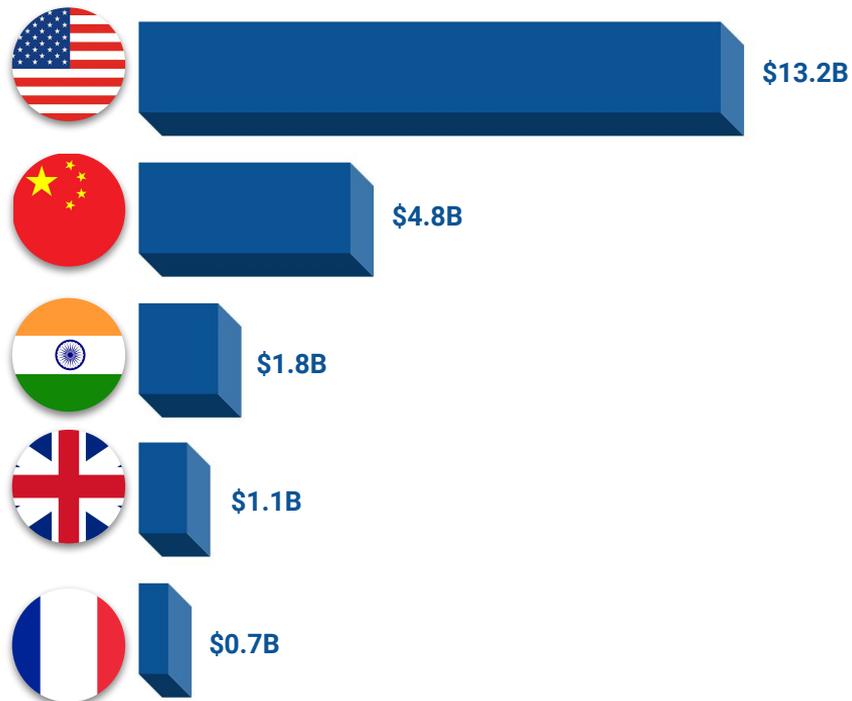
Comparative  
Analysis

Qualitative Data  
Collection

Data  
Filtering

# Key Findings

## Top 5 Countries by Investments in 2020



<b>~\$80B</b>	investments in AgriFoodTech companies since 2010*
<b>\$20B+</b>	investments in AgriFoodTech companies in 2020*
<b>800+</b>	Analysed Investors
<b>400+</b>	Analysed Companies
<b>15</b>	Technologies
<b>10</b>	Categories
<b>AgTech</b>	has the largest number of companies
<b>USA</b>	is the leading country in the number of FoodTech companies
<b>North America</b>	is the leading region in the number of FoodTech investors
<b>Sustainability &amp; Waste Management</b>	are the trendiest companies' goals

# Global FoodTech Landscape Overview



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# FoodTech Industry Landscape Ecosystem

FoodTech (or ArgiFoodTech) is an ecosystem made of all the food entrepreneurs and startups (from production to distribution) innovating on the products, distribution, marketing or business model. With the global population growing and demands increasing each year, **food manufacturers will adopt more technology** to streamline operations and boost output. Among the most popular technologies used by FoodTech companies are Artificial Intelligence, Blockchain, the Internet of Things, Machine Learning, Robotics, etc.

## Global FoodTech Market Size



New technologies have changed the world and the rules of the game in many industries. However, the food industry is still wondering how to apply innovations such as Big Data or the Internet of Things to its business.

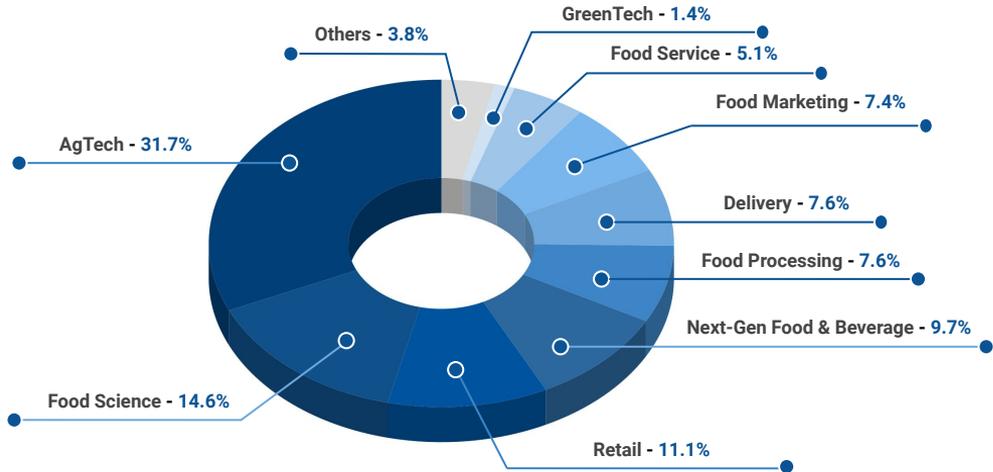
The Global FoodTech Market Size was nearly **\$220B** in 2019. With advancing technologies within the food industry and a demand for healthier, cheaper, and safer food products, the FoodTech market could reach a total turnover of more than **\$342B** by 2027.

## Main Categories

-  **AgTech**
-  **Delivery**
-  **Food Marketing**
-  **Food Processing**
-  **Food Science**
-  **Food Service**
-  **GreenTech**
-  **Next-Gen Food & Beverage**
-  **Retail**

# Global FoodTech Market Overview (1/2)

## Companies by Category



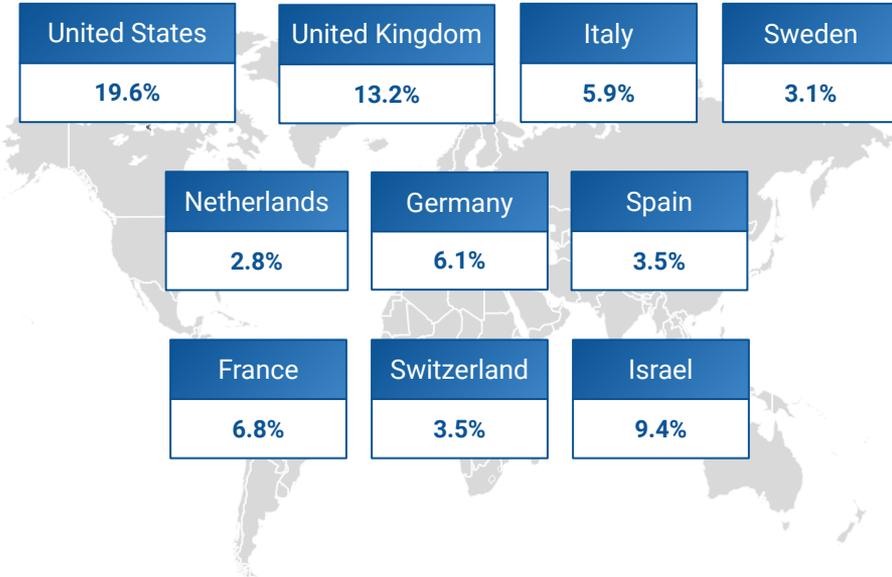
## Technologies and Solutions Used in FoodTech

Advanced Analytics	Artificial Intelligence	Automation
Big Data	Blockchain	E-Commerce
Intelligent Data Analysis	Internet of Things	Machine Learning
Robotics	Smart Waste Disposal and Recycling	Software and Platform
Supply Chain Management	Sustainability Solutions	Others

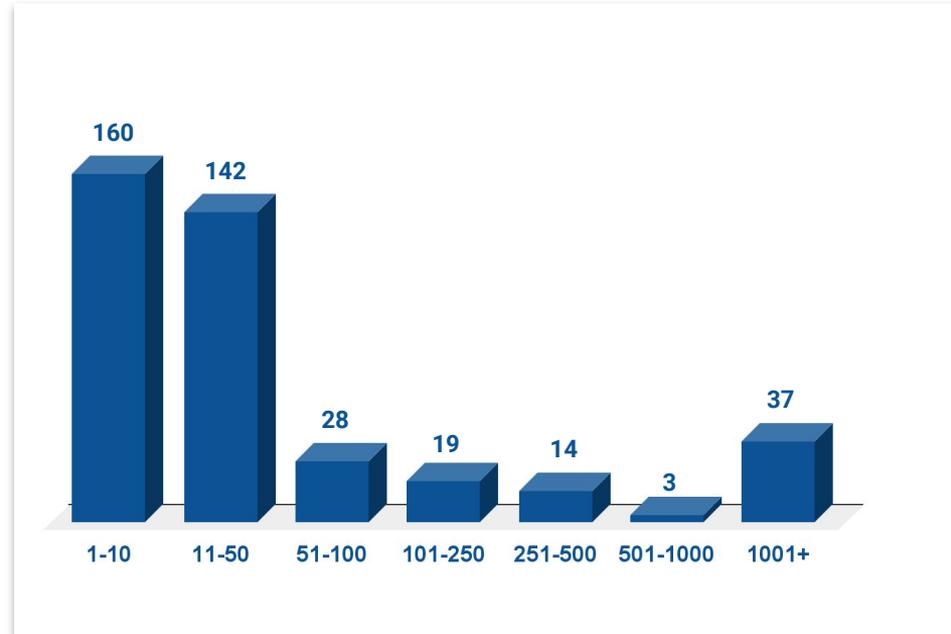
AgTech appears to be the top category among FoodTech companies and accounts for nearly half of all companies. AgTech is the utilization of technology to improve services and products that aim at increasing farming efficiency and sustainability. Sustainability has become a trendy topic nowadays, and companies are focused on implementing sustainable solutions, smart waste disposal and recycling to protect nature. Moreover, companies are implementing different advanced technologies to improve operations and enhance customers' lives.

# Global FoodTech Market Overview (2/2)

## Top-10 Countries by the Number of FoodTech Companies



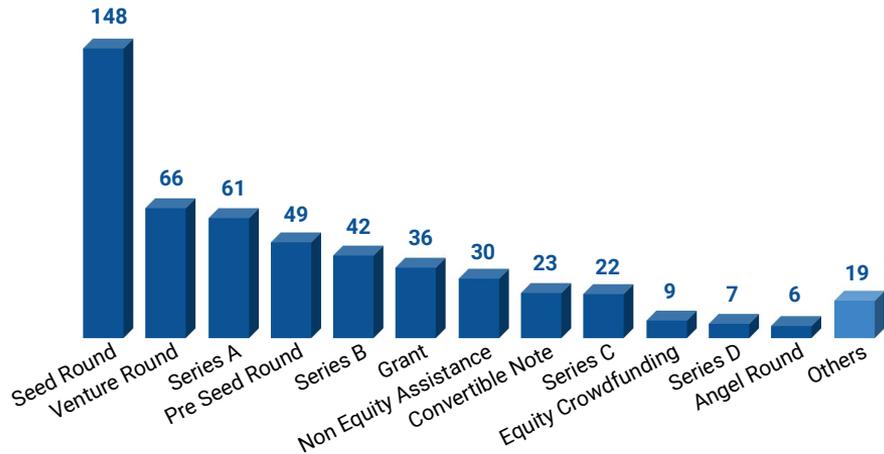
## FoodTech Companies by Number of Employees



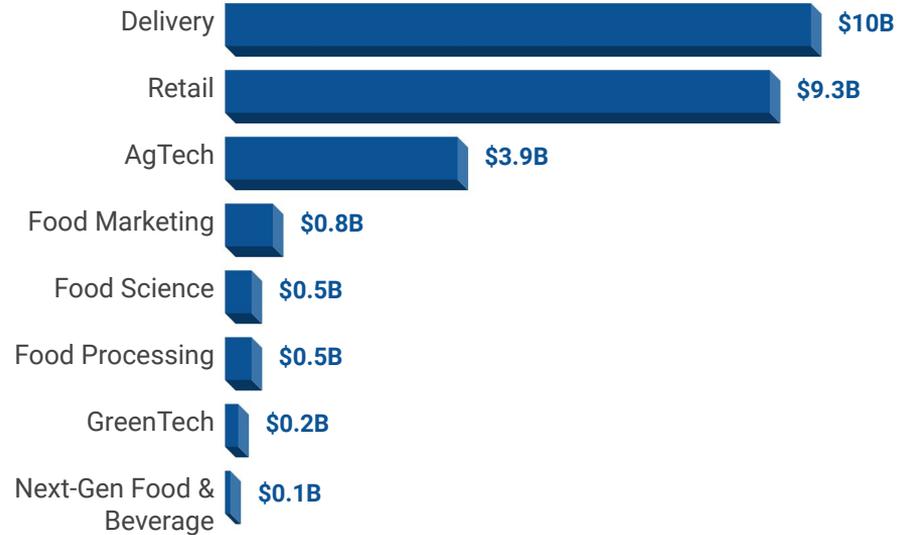
The United States holds the largest number of FoodTech companies. The food industry in the US is developing fast, with the number of startups in the country rapidly increasing. The United Kingdom and Israel follow the United States, accounting for 13.2% and 9.4% of analyzed companies, respectively. In terms of the number of employees, small companies (less than 10 workers) are the main category, as startups are contributing to the booming of the FoodTech industry.

# FoodTech Companies by Funding

## Number of Funding Deals Summarized, 2015-2020



## Top-50 Companies' Total Funding by Category



Most deals in FoodTech were made during Seed Round, Series A, and Pre Seed Round. Delivery companies raised more than \$10B, following by Retail and AgTech companies.

# Top-30 FoodTech Companies by Funding\*

1		DoorDash	\$2,4B
2		Deliveroo	\$1,7B
3		Karakuri	\$660M
4		AppHarvest	\$566M
5		Plenty	\$541M
6		Bowery Farming	\$468M
7		Infarm	\$405M
8		NotCo	\$360M
9		AeroFarms	\$238M
10		Aleph Farms	\$236M

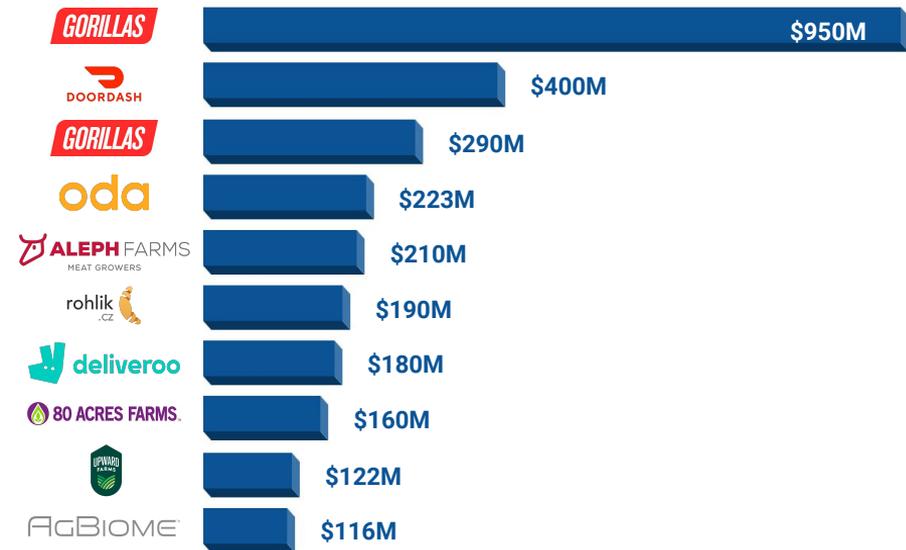
11		Imperfect Foods	\$229M
12		Choco	\$164M
13		Upward Farms	\$142M
14		AgBiome	\$137M
15		v2food	\$112M
16		TerViva	\$86M
17		Biotallys	\$72M
18		Green Monday Holdings	\$70M
19		Controlant	\$55M
20		Ukko	\$48M

21		Planted Foods	\$46M
22		Too Good To Go	\$46M
23		Phytech	\$44M
24		80 Acres Farms	\$40M
25		Innovopro	\$39M
26		Picnic	\$38M
27		Equinom	\$38M
28		AgriWebb	\$37M
29		Label Insight	\$35M
30		HUNGRY	\$33M

Notes: \* Among the analysed companies, for the entire period of the company's existence

# Top Companies and Investment Deals

## Top-10 Deals in 2020-2021 Q3 by Investments



### United Kingdom



**Deliveroo**  
London, United Kingdom



### Israel



**Aleph Farms**  
Rehovot, Israel



### United States



**DoorDash**  
San Francisco, California, US



**80 Acres Farms**  
Cincinnati, Ohio, US



**AgBiome**  
Raleigh, North Carolina, US



**SOSV**  
Brooklyn, New York, US



### Norway



**Oda**  
Oslo, Norway



### Germany



**Agronomics**  
Berlin, Germany



### Czech Republic

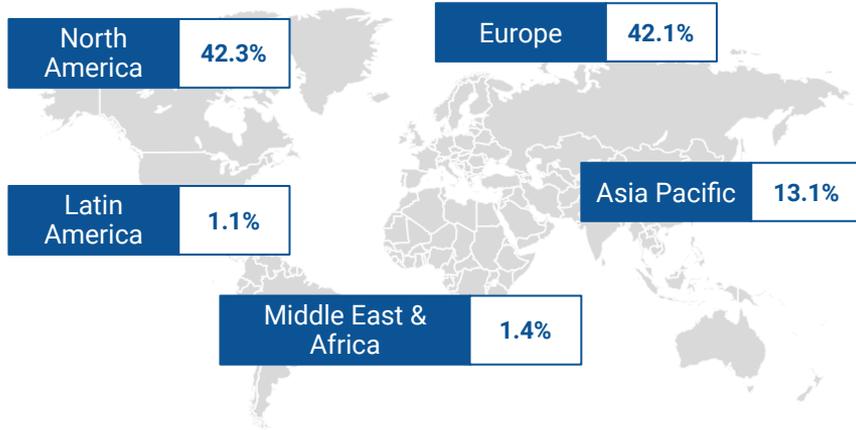


**Rohlik**  
Karlín, Czech Republic

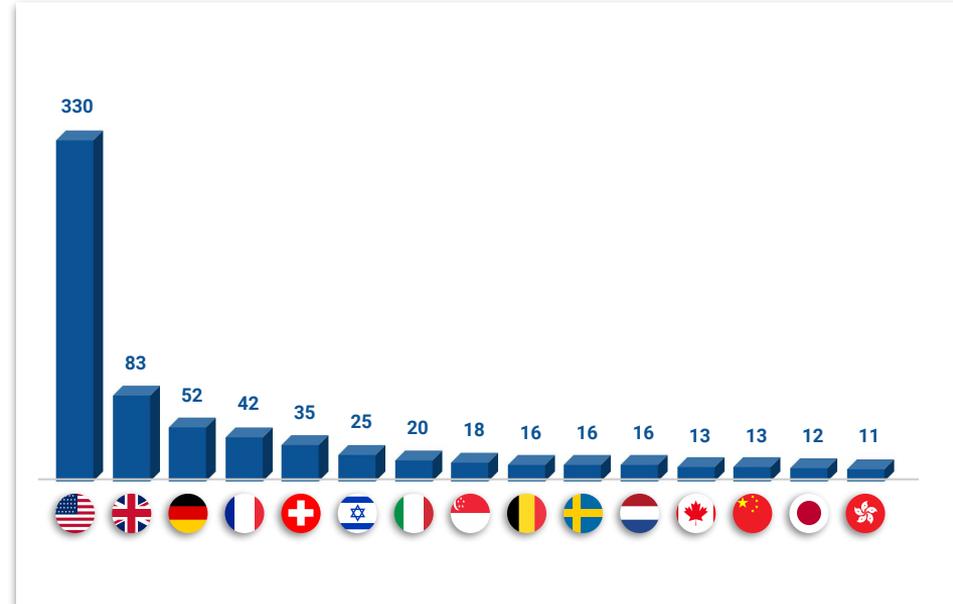


# FoodTech Investors' Regional Distribution

## Investors: Regional Proportion



## Top-15 Countries by Number of Investors



Almost half of investors are located in North America. The second biggest region by investors' location is Europe with a more than 42% share. The Top-3 countries by the number of investors are the United States (39.5%), the United Kingdom (9.9%), and Germany (6.2%).

# Top Investors and Investment Deals

## Top-10 Investors by Number of Deals in FoodTech Companies



### United Kingdom



#### Agronomics

Douglas, United Kingdom



#### CPT Capital

London, United Kingdom



### United States



#### MassChallenge

Boston, Massachusetts, US



#### Techstars

Boulder, Colorado, US



#### Y Combinator

Mountain View, California, US



#### SOSV

Princeton, New Jersey, US



### Belgium



#### EASME

Brussels, Belgium

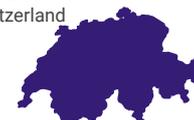


### Switzerland



#### Blue Horizon

Zürich, Switzerland



### France



#### Kima Ventures

Paris, France



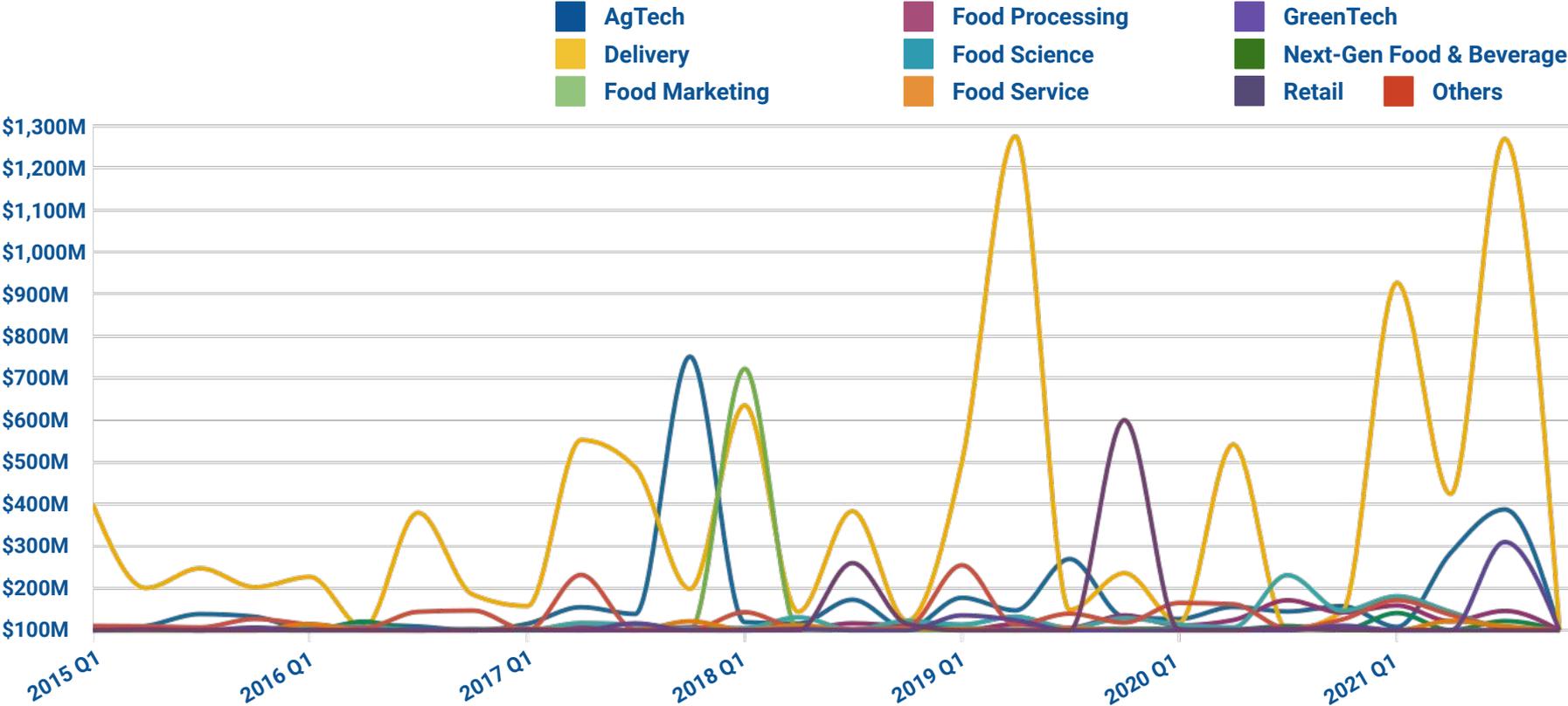
### Israel



#### Israel Innovation Authority

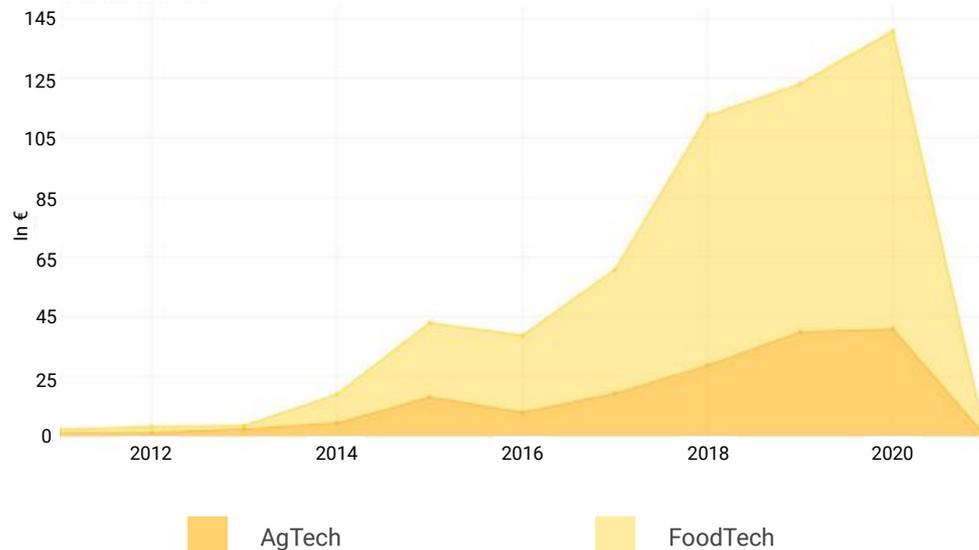
Jerusalem, Israel

# Dynamic of Investments by Category



# Raised Capital Evolution

## Evolution of Raised Capital: How Much Capital Has Been Raised Over Time?



The AgriFoodTech sector's investment level started to rise significantly in 2016 and has kept growing at a 42% CAGR since then. Geographically, while the US has been leading this increase, both by number of startups (1,300+) and levels of investment, Europe and, most recently, Asia are quickly catching up.

Silicon Valley, London and Israel, with more than 1,000 startups focusing on AgriFoodTech, are attracting more than 30% of global investments. More recently, developed hubs like Singapore, Paris, or Berlin are starting to emerge.

FoodTech is becoming a more prominent component of the overall agrifood technology space. As of the end of Q4 2020, agrifood tech startups will raise \$11.6B in funding, and FoodTech companies made up 72% of those investments. The space has benefited from the COVID-19 pandemic, with consumers spending more on home cooking than eating out for the first time since 1994.

# FoodTech Startups



German-engineered and based on scientific evidence, **Air Up** (stylised as “air up”) helps buzz and delight the brain while maintaining health. Air Up offers a wide variety of flavours for drinking water, powered only by scent.

🚩 **Founded Date:** 2018 🇩🇪 **HQ:** Germany



**AlgoCart's** Nutritional-AI helps customers achieve their health goals. The 'Deep Nutrition' technology empowers everyone to buy according to their own dietary goals without prior knowledge of nutrition or ingredients.

🚩 **Founded :** 2020 🇮🇱 **HQ:** Israel



With its blockchain and IoT (Internet of Things) platform, **Authena** wants to revolutionise how brands of high-value goods protect their products and reputation against counterfeiting and reach an unprecedented level of end-user engagement.

🚩 **Founded :** 2018 🇨🇭 **HQ:** Switzerland



**Brewbird** is developing a technology platform to scale the \$100 billion speciality coffee market while working with top local and national roasters to bring the highest quality cup of coffee to every home and office.

🚩 **Founded :** N/A 🇺🇸 **HQ:** United States



**GOURMEY** is France's pioneering cultivated meat company. They create sustainably produced meat delights for an uncompromising and conscious generation.

🚩 **Founded:** 2019 🇫🇷 **HQ:** France



**Greenbar** operates modular farms and creates display cases for growing fresh, healthy crops, greens and microgreens. Farms are controlled remotely using a centralised cloud platform, and the entire management system is based on IoT technologies.

🚩 **Founded :** 2019 🇷🇺 **HQ:** Russian Federation



**Journey Foods** is a bold, machine-learning-powered software platform for food companies. The company builds enterprise technology that improves product monitoring and development for CPG companies, ingredient suppliers, and manufacturers.

🚩 **Founded :** 2018 🇺🇸 **HQ:** United States



**Kiinns** is a food-safety startup in the intersection of FoodTech and Industry 4.0 that invented a technology that isolates the food from the processing equipment in food production lines. This unique isolation technology eliminates the need to clean the equipment after use.

🚩 **Founded :** 2018 🇮🇱 **HQ:** Israel

# Upcoming Events & Industry Influencers



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# Upcoming Events 2021-2022



**EXPO 2020**  
October 1, 2021 – March 31, 2022  
Offline event  
Dubai, UAE



**Food Regulatory & Quality Assurance Summit**  
October 26 - 27, 2021  
Virtual event



**Food Tech Congress**  
November 3 – 4, 2021  
Hybrid event  
London, UK



**International Conference on Food Chemistry & Technology**  
November 8 - 10, 2021  
Virtual event



**Asia-Pacific Agri-Food Innovation Summit**  
November 27 – 29, 2021  
Virtual event



**Food Tech Matters**  
November 29-30, 2021  
Virtual event



**Food Tech at CES 2022**  
January 5 – 8, 2022  
Offline Event  
Las Vegas, US



**The Future Food-Tech Innovation & Investment from Farm to Fork**  
March 24 - 25, 2022  
Offline event



**2nd International Conference on food technology & beverages**  
April 28 - 29, 2022  
Offline event



**Food 4 Future**  
May 17 – 19, 2022  
Offline event  
Bilbao, Spain



**The Future Food-Tech Alternative Proteins**  
June 21 - 22, 2022  
Offline event



**Future Food-Tech**  
September 22 – 23, 2022  
Offline event  
London, UK

# FoodTech Industry Influencers (1/3)



**Albert Icart  
Martori**  
Kibus Petcare



**Anthony Finbow**  
Eagle Genomics



**Avi Lasarow**  
DNAFit



**Bruce Friedrich**  
GFI



**Chacko Cherian**  
RawData



**Clayton Wood**  
Picnic



**Detlef Weigel**  
Computomics



**Divya Gautam**  
Happ



**Douglas Giampapa**  
Healthycell



**Emeka  
Nwachinemere**  
Kitovu



**Emilio Sepulveda**  
Natural Machines



**Eran Blachinsky**  
Better Juice



**Eyal Afergan**  
Imagindairy



**Faith Son**  
Healright



**Gerrit Meier**  
Foodspring



**Ignace de Nollin**  
SmartWithFood



**Ivan Aimò**  
Deliveristo



**James Collier**  
Huel

# FoodTech Industry Influencers (2/3)



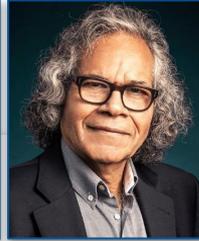
**Jamie Crummie**  
Too Good To Go



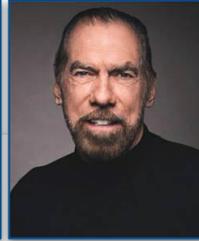
**Jeremy Hibbert-Garibaldi**  
Collectiv Food



**Johan Jörgensen**  
Sweden Foodtech



**John Kapoor**  
Akorn



**John Paul DeJoria**  
Patrón Spirits  
International



**José Luis Cabañero**  
Eatable  
Adventures



**Jürgen Schrezenmeir**  
GlucoZero



**Kevin Camphuis**  
ShakeUpFactory



**Kishan Vasani**  
Spoonshot



**Leah Bessa**  
De Novo Dairy



**Leticia Gonçalves**  
ADM



**Lisa Macfarlane**  
The Gut Stuff



**Lorenzo Conti**  
Crover



**Luther Lawoyin**  
Pricepally



**Matias Muchnick**  
NotCo



**Matija Zulj**  
AGRIVI



**Nadia El Hadery**  
YFood & London  
Food Tech Week



**Nicolas Morin-Forest**  
GOURMEY

# FoodTech Industry Influencers (3/3)



**Nigyar Makhmudova**  
Danone



**Oded Omer**  
Wasteless



**Peter Kruger**  
AgFood Ventures



**Riana Lynn**  
Journey Foods



**Sara Roversi**  
Future Food  
Institute



**Sung Park**  
FYXX Health



**Tom Mohrmann**  
Protifarm



**Tony Xu**  
DoorDash



**Tracy Shafizadeh**  
Evolve BioSystems



**William Shu**  
Deliveroo



**Yuval Canfi**  
AlgoCart



**Zak Oganian**  
G7G



**Zina Mavroei**  
E-fresh.gr

# FoodTech Companies and Business Case Studies



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# AGRIVI: About



Headquarters - London, United Kingdom



Industry - AgTech



Number of employees - 10-50



The **AGRIVI** approach to solving the global food problem is through digitisation of agriculture; that is, by switching the farmer's decision-making from being reliant on traditional practices and historical knowledge to a new, data-driven and fact-based form of decision-making empowered by best growing practices and real-time agronomic insights that are available using technology.

AGRIVI builds a comprehensive suite of digital agriculture solutions for farms, food companies, agribusiness banks, ministries of agriculture and other important stakeholders of the agri-food value chain to support them in adopting the change and empower their digital transformation projects.

## AGRIVI Industries



Farms / Enterprise  
Farms



Cooperatives



Food & Beverages



Banks



Input  
Manufactures



Agronomic Advisory

## Products

### AGRIVI 360,

Comprehensive and all-encompassing insight into crop production management with leading farm management software for farmers, food processing companies and other agri-food value chain stakeholders.

### AGRIVI IoT<sup>iii</sup>

Real-time insights into field data, from micro-climate and soil conditions to farm machinery fleet monitoring.

## Case Study: Nestlé

**Over 150  
years in  
business**

**2,000+  
food products**

**Sold in 186  
countries**

**High  
standards of  
quality**

**Prioritisation  
of food safety**

### Challenge:

To make sure all of their suppliers use the very best agronomic practices and comply with the highest sustainability standards, the company implemented Nestlé Responsible Sourcing Standard, a list of non-negotiable instructions and standards for farmers relating to:

- Soil health,
- Water usage,
- Agrochemicals usage,
- Fertilisers, etc.

To be eligible to be a Nestlé contractor, farmers have to comply with a strict set of standards, use controlled agronomic measures and apply legally registered products for the sole need of controlling weeds, diseases, or invasive species and pests, without prophylactic use.



### Solution:

By implementing the AGRIVI 360 Supply Chain Management platform, Nestlé made their supply chain 100% transparent and provided their suppliers with the tools necessary to meet high sustainability and food safety standards of the companies Responsible Sourcing Standards.

Using AGRIVI 360 Supply Chain Management platform, Nestlé was able:

- To gather data about agronomic practices by their suppliers;
- To monitor the quality of output and sustainability KPIs; and
- To secure full production traceability of their resources and compliance with food safety standards.

# AlgoCart: About



AlgoCart

Headquarters - Tel Aviv, Israel



Industry - Food and Beverage Tech



Number of employees - <10



**AlgoCart** is developing the next generation of Health & Nutrition personalization for online grocery and food ordering. Two out of three people in the world are dieting. The rest want to be healthy. Consumers know their nutrition goals (a healthy heart, low sugar, strong immune system, weight loss, etc.), and some can even name the ingredients they need to avoid, such as saturated fats, empty carbs, processed foods, or harmful foods sugar substitutes. Those they need to increase such as fibre and vitamin intake. With AlgoCart's Deep Nutrition technology, customers don't need to know anything about nutrition or understand ingredients. Nor do they need to filter for nutrition attributes every time they search for an item.

## Benefits



One-click dietary profiling



End-To-End Solution



AI algorithm improves with time



Health-based ad targeting at consumers



Incentivising Healthy Living

## Partners



ACT Foodtech



SigmaLabs



Sarona Partners

## Case Study: Shopping according to health needs without any knowledge of nutrition or ingredients

**Next-generation Health&Nutrition Personalisation for Retailers:** AlgoCart's cutting-edge Nutritional-AI allows retailers to help their customers perform better at sports, support the immune system, reduce stress, eat well while pregnant, and much more.

### Problems:

70%

of the world's population is on some kind of diet

2/3

cannot match the food they buy with their health situation

88%

try to improve their health by reading labels; most fail to understand the information

### Solutions:



Derived dietary attributes: Gluten free, vegan, high fibre



Holistic 'Health Tracks': Heart health, sports nutrition, keto diet, pregnancy, etc



Zero friction: no research, filtering or nutrition knowledge required



Consumer dietary profiling: using identity resolution we 'know' the consumers wherever they are



Cross-channel personalisation: unprecedented ad, content and shopping personalisation

# Computomics: About



## Computomics GmbH

Headquarters - Tübingen, Germany



Industry - AgTech



Number of employees - 10-50



**Computomics** utilises cutting edge bioinformatics tools to offer highly accurate, customised service projects to companies across the globe.

The company helps navigate the complexities of all genomes. Advanced machine-learning methods enable rapid understanding of genomic data for agricultural, BioTech, microbiome, and metabolomics researchers.

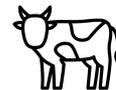
The company provides clients with a thorough consultation on their sequencing projects, in-depth analysis of their genomic data, and comprehensive reports.

## Services

Computomics was founded to bring the latest bioinformatics discoveries to industry application, facilitating global agricultural development.



Crops



Animal Health



Metagenomics and  
Microbial Genomics

## Partners



LemnaTec



CeGaT



Pacific Biosciences



University of Tübingen



Max Planck Institute  
for Developmental  
Biology



Swiss Federal  
Institute of  
Technology in Zurich

## Case Study: Improving food shelf life through image recognition and AI-based plant breeding

Close to 1.3 billion tons of food are wasted each year globally, roughly a third of all food produced. Approximately 60 percent of the food waste is simply food that is past its shelf life and is not fit for consumption anymore. Fruits and vegetables have a relatively short shelf life. Breeding new varieties of fruits and vegetables with increased shelf life can help alleviate the issue of food waste.

### Challenge:

#### Reducing the cost of plant breeding

to make it more attractive to SMEs and enable breeding of plants with increased shelf life.

#### Applying AI methods and genome research

to develop automated procedures for plant scoring based on image recognition to supplement or replace manual scoring, which is labour-intensive (and prone to error).

#### Identifying genetic markers related to increased shelf life



### Results:

#### Data collection phase

6,000+ high-resolution images for basis for ML. ~25,000 data points generated for ML and genotype/phenotype associations.

1,000 leaf samples for DNA sequencing and genotyping.

#### Plant Scoring

Score prediction via deep learning methods works well and is giving a fast prediction result.

#### Genotyping

Scoring prediction using ML is an established service at Computomics.

Genetic marker candidates associated with shelf life have been identified.



### Next Steps:

#### Integrate the AI-based assessment

as another analysis module into CropScore, Computomics' automated phenotyping system

**Improve the accuracy of the AI models by enlarging datasets.**

# Crover: About

# CROVER

GRAIN STORAGE MONITORING

Crover Ltd.

Headquarters – London, United Kingdom



Industry – AgTech



Number of employees – 10-50



**Crover** is a small and diverse team with the shared dream of radically improving, through drastic innovation, the agri-food sector (particularly the grain supply chain).

Crover's vision is to radically improve the efficiency of bulk storage along with the GOP (grains, oilseeds, and protein crops) supply chain, thus reducing grain losses due to spoilage and avoiding the deterioration in the quality of these valuable crops that are the backbone of the global food system and crucial in sustaining the world's population.

## Potential Applications



Extraplanetary Soil  
Exploration and  
Analysis



Subterranean Probing  
and the Recovery of  
Buried Objects



Seabed  
Analysis

## Support and Partnerships



## Case Study: Grain Storage Monitoring Revolution

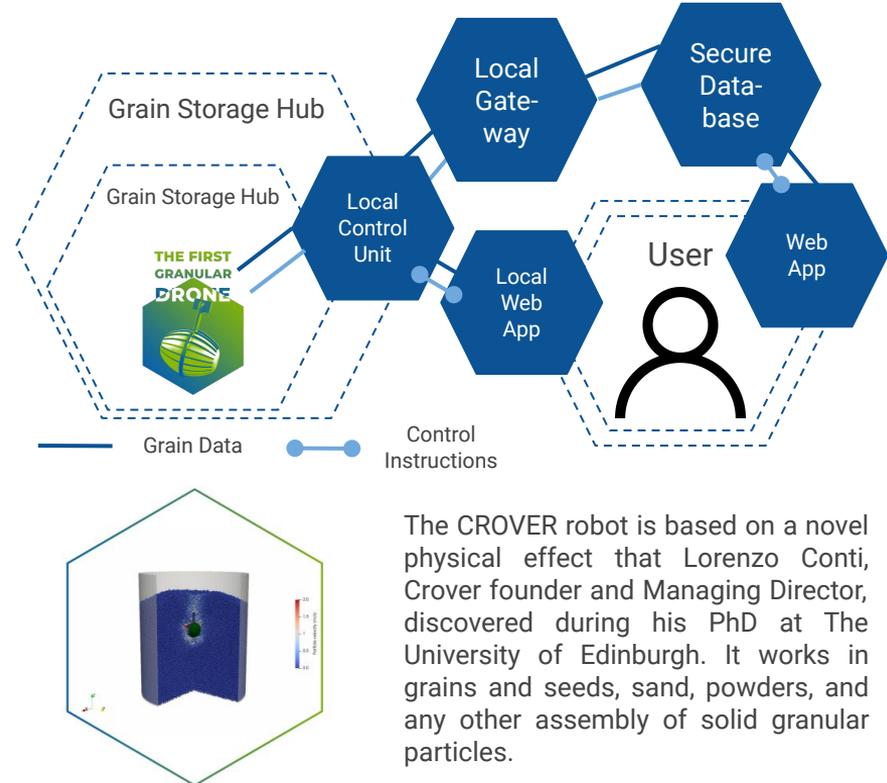
### Problem:

Grains are the cornerstone of the global food system. Yet, post-harvest losses during long-term storage are exceptionally high, above 20% in the UK and worldwide. Pests are to blame, with grain moisture content and temperature being the most significant factors. Cereal storage sites such as farms, grain merchants, millers and breweries, experience these challenges, which have high-cost implications in terms of lost revenue and cost to rectify.



### Solution:

A CROVER is the first robotic device able to swim through grains. It has both temperature and moisture sensors on-board to measure these two parameters as it moves autonomously through the bulk of the grains. Grain storage operators will receive a notification when temperature and moisture values exceed a threshold. They can then remotely log into the CROVER web platform to visualise a 3D map of temperature and moisture and a historical plot of how these conditions have changed over time. This allows them to identify a problem in the early onset and intervene before infestations can develop.



The CROVER robot is based on a novel physical effect that Lorenzo Conti, Crover founder and Managing Director, discovered during his PhD at The University of Edinburgh. It works in grains and seeds, sand, powders, and any other assembly of solid granular particles.

# Deliveristo: About



Headquarters - Milano, Italy



Industry - Delivery



Number of employees - 10-50



**Deliveristo** is a B2B FoodTech marketplace and delivery platform which allows chefs and restaurant owners to organize their orders directly from farmers and distributors digitally. It is the largest online marketplace for chefs and restaurateurs: customers can compare and choose between +350 suppliers and +30,000 products.

Both restaurateurs and suppliers can benefit from a single point of billing. The company aims to market where restaurateurs can find everything they need and order in the simplest and fastest possible way.

## Benefits



Speed



Simplicity



Quality

## Partners & Media



## Case Study: The B2B Food Delivery Market Digitalization

While the digitization of the B2C Food Delivery Market is now mature, worth a combined 92B€ enterprise value in EU in less than 10 years (Source: Dealroom.co – The State of European Foodtech 2021), the B2B Food Delivery Market (i.e. from Suppliers to Ho.Re.Ca – Hotellerie, Restaurant, Cafè) is still undigitized and is representing the next big opportunity. Ho.Re.Ca. Spending on food procurement in Europe is a 300B€ market, and it is still totally managed with the same old ordering mode: text messages, e-mail, phone calls.

### Problem:

Usually, one restaurant must deal with at least ten different suppliers every week and, further than ordering, there is the issue of several other payments and billing points. Prices often change on fresh products every day or every week, and there is still no one place where it is possible to find every supplier and their updated listings. On the other side, suppliers have difficulties promoting themselves and, after having acquired a new customer, managing orders and payments. As far as cost is concerned, it is one of the main challenges they face: they have hundreds of different customers with hundreds of other billing points, and making sure to receive it regularly is challenging.



### Solution:

Deliveristo tried to create something unique that is a pure software marketplace. The company adopts a drop-shipping approach that doesn't entail warehouse dynamics and costs, allowing flexible and cost-effective logistics management. Its cloud-based platform allows even to manage and simplify the administrative aspects of the orders (e.g., payments and billing) for both restaurateurs and suppliers.

### Two other ways to approach B2B Food Delivery:



Advanced but narrowly specialized distributors;



Pure software operators (messaging companies);

# Generation 7 Group: About



Headquarters - Geneva, Switzerland



Industry - Next-Gen Food & Beverage



Number of employees - <10



**Generation 7 Group** is a “seven-brand powerhouse” that owns and operates heritage brands. Focusing on developing digital capabilities to power offline to online integrations. Merging the past behind the world’s most valuable brands with the future of cutting-edge technologies to build a new world and new value for subsequent generations.

***“Walking the streets of the future is going to be breathtaking.”***

- Zak Oganian, CEO of G7G

## G7G Powerhouses



Augmented Reality



Virtual Reality



Non-Fungible Token



Innovations

**META**

Metaverse



KINAHANS.WORLD



Digitalisation



3D Technologies

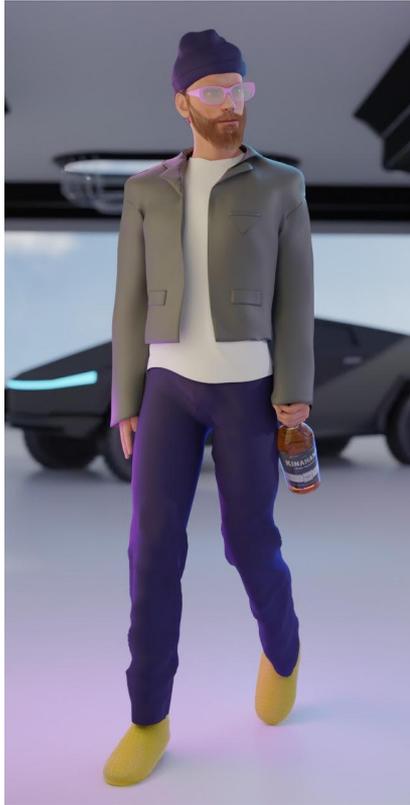


Blockchain

The vision behind G7G is to create a future where the value of heritage and authentic craftsmanship is preserved, reimagined and unlocked over again for generations to come. We do this through ever-evolving, sophisticated tech capabilities that allow us to transform consumer expectations into experiences. Imagine a new world, where technology is the shop window for all your favourite brands.



## V.1 Metaverse Space



### Intro:

VR, AR and NFT help create an impressive environment, an immersive experience that allows a brand to go beyond anything that can be achieved with traditional marketing tools. In addition to S&M benefits, these technologies are an effective tool for sales. Because they advance the communication of vibrant stories and the conveyance of complex cultural information about products and the emotional value products can carry.

### Technologies:

One of the key parameters for G7G is to ensure that the initial v.1 of their technologies is less complex but more functional. G7G introduced objects within v.1 metaverse space that are for sale via NFT and can be used via AR (once purchased) to bring the concept close to the consumer to help bridge that offline to online gap initially.

G7G expects that the above technologies will improve brand interaction and open a new sales opportunity, as recent studies indicate that consumers are increasingly ready to spend their money on digital in place of physical.

### Application:

VR, AR and NFTs have a virtually unlimited number of applications. G7G is currently focused on developing along the line of cultural branding, introducing experiences that enhance product emotional perception for the following scenarios:

	AR	VR	NFT
Brand Building	✓	✓	✓
Brand Awareness	✓	✓	✓
Product Identity Communication	✓	✓	✓
Product Application, Use or Consumption		✓	
Brand or Product Use	✓	✓	✓
Sales	✓	✓	✓

The above application of technologies is just the start of a completely new B2B sales and marketing journey for G7G. Various statistics and studies point out that interest and investment in AR, VR and NFTs are due to accelerate, with B2B being at the forefront of this growth.

# Imagindairy: About



Headquarters - Illinois, United States



Industry - Food Science



Number of employees - <10



**Imagindairy Inc.** is developing a novel technology that integrates AI/machine learning, synthetic, system and molecular biology to design food grade microbial strains to produce a high yield of milk proteins. The company's cellular agriculture technology provides a solution to overcome the cost of production scale by achieving an increased protein expression level. They are using a food-safe microbial system that has been used for thousands of years to produce fermented foods. These microbial strains are also used in the food industry to produce industrial enzymes and heterologous proteins that are designed to express and secrete human and animal milk's proteins that are essential for nutrition.

## Benefits



Healthier  
Foods



Antibiotic  
Free



Animal  
Welfare



Environmentally  
Friendly



Food  
Safety

## Supporting Ecosystem



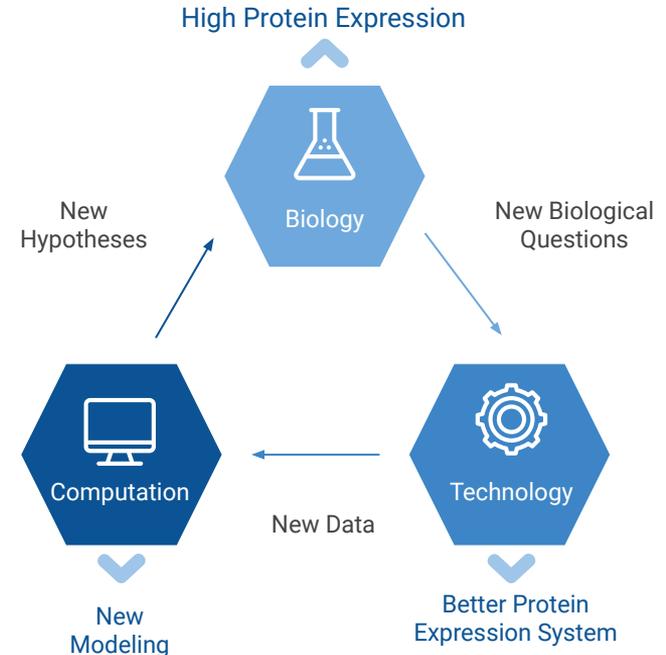
**Mission:** "To bring healthy and tasty animal-free dairy goods for everyone at an affordable price, while preserving the environment and protecting the animals."

## Case Study: Grain Storage Monitoring Revolution

Developing an integrated AI/machine learning approach that is tailored to the relevant host and its interaction with the specific transgene of interest throughout the entire development process while considering all gene expression steps could significantly improve the expression of heterologous proteins. Imagindairy is partnered with an international leading group at Tel Aviv University that has developed a proprietary platform to improve heterologous protein expression and production. The company uses analytic tools for large data, system biology, and innovative machine-learning algorithms to optimize the transgene of interest to the host. It can also identify potential alterations in the host genome that could improve heterologous protein production. Imagindairy's proprietary ExpEng platform uses information on existing host transcripts and attributes combined with a series of biophysical models of gene expression, protein folding, and molecular evolution.

Moreover, ExpEng is used throughout the entire development process, from the expression screen to a large-scale fermentation. The ExpEng platform significantly improved the expression of heterologous proteins in several microbial and unicellular systems, including yeast, bacteria, various microalgae, and viruses. We are currently focusing our efforts to apply the ExpEng platform to produce the milk's proteins in selected microbial systems. These microorganisms are a food safe microbial expression system that makes high levels of heterologous food proteins.

### Integrating system and synthetic biology for maximal milk's protein production



# Kibus Petcare: About



Headquarters - Igualada, Spain



Industry - Food and Beverage Tech



Number of employees - <10



**Kibus Petcare** offers a device that cooks pet food automatically. Its device allows pet owners to serve their pet a natural and healthy food, which is human-grade, minimally processed and completely tasteful. It works automatically and only required to push a button and the device makes everything. It is possible to program the appliance to work automatically and start cooking at a specific time.

**Competitive Advantage: The first device that cooks healthy pet food automatically.**

## Benefits



Formulated by Veterinarians



Comfortable and Easy to Use



Sustainable and Ethical



Natural Ingredients



Freshly cooked

## Support and Partnerships



PERSONA CIENCIA EMPRESA  
TECH FACTORY



Purina



INICIATIVAS  
neotec



Barcelona Activa

LANZADERA

Persigue tu sueño emprendedor

brinc

netmentora  
by microempresas  
catalunya



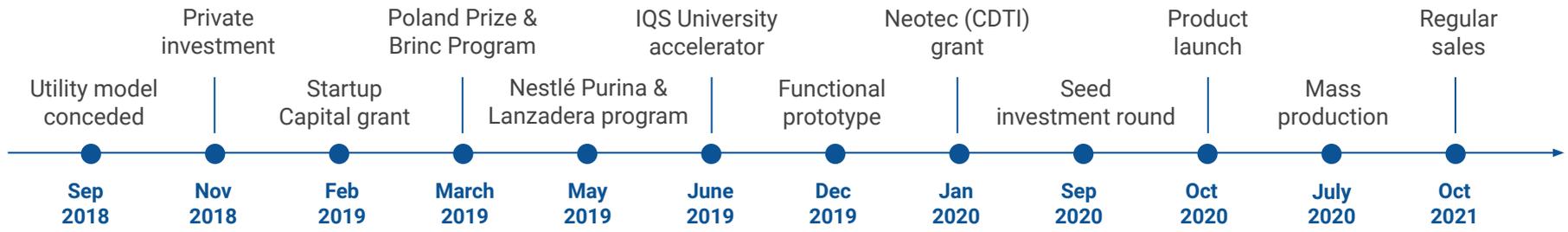
## Case Study: Automation of cooking healthy pet food

There are almost 500 million dogs and cats in the world consuming more than 80 bn € in pet food every year. The alternative solutions are the category with the highest growth in the industry (+50%) despite its inconvenience. Kibus's model consists in selling both the device and the pet food capsules. The company has been conceded a utility model in Spain, being expanded into a world patent. Kibus Petcare solution competes with traditional pet feeders, despite they only dose traditional food whilst Kibus is cooking warm and healthy food.

**Challenge:**  
Pet parents consider their pets as part of the family, and they want to give them the best nutrition. They are no longer satisfied with the traditional solutions, which are highly processed, and they are moving to healthier solutions, such as frozen and dehydrated food. However, they are very inconvenient, and they require a preparation process before every meal.



**Solution:**  
Kibus is a home device that cooks healthy pet food automatically, using multidose capsules of human-grade dehydrated food. It allows pet owners to feed their pets a healthy and natural diet in a convenient way. As it is minimally processed, it keeps the nutrients and flavours from the fresh ingredients. It has a great taste, and it has been proven that feeding pets on a minimally processed diet expand their lifespan by more than 30%.



# Kitovu: About



Kitovu

Headquarters - Iseyin, Nigeria



Industry - Food Science



Number of employees - <10



**Kitovu** developed a digital platform that applies remote sensing and data science to provide personalized input recommendation, soil and crop health, decision support, and market insights, enabling smallholder farmers to reduce inputs cost by 30%, double yields, and get access to guaranteed markets.

**Mission:** “To bring healthy and tasty animal-free dairy goods for everyone at an affordable price, while preserving the environment and protecting the animals.”

## Major Service



fertiliser  
Recommendation



Plant Health  
Analysis



Water Stress  
Analysis



Weather Reports



Management System

## Worked With



## Case Study: Help Africa to feed the world

Typical farmers in Africa grow largely Grain and Cassava in distant pocket locations living on under \$1 per day. Average age of 64, they live in rural area and cultivate 2-4 harvests annually. Compared to global yield averages, their yields are very low at a third of global yield averages. They also have limited market insights that would enable them to grow what the food industry needs. Thus, they have low purchasing power and are in need of inputs subsidies/loans.

### Problem:



Low crop yields because the farmers rely on guesswork to make their farming decisions.



Lack of access to high quality inputs due to low purchasing power of the farmers.



Lack of accessible fair markets due to fragmented nature of farms.

### Solution:

Farm productivity platform that enables smallholder farmers access precise inputs, soil and crop health insights, access to storage, and market linkages;

Providing them with the data to make smart decisions about what to grow that would sell.

Unique value proposition is data driven crop health insights, agronomic advisory, and free e-extension services to farmers.

### Results:

**7,450** clients-farmers in 7 states of Nigeria

**50%** increase in yield above the national yield average

by **30%** reduced the cost of their inputs

by **20%** cut down on post harvest losses

# Natural Machines: About



Headquarters - Barcelona, Spain



Industry - Food Processing



Number of employees - 10-50



**Natural Machines** aims to produce a full range of innovative kitchen solutions improving the quality and enjoyment of food, making it easier to be in complete control of all foods and have a positive environmental impact by lessening food loss/waste. The company furthers the advancement of the United Nations Sustainable Development Goals, #12: responsible consumption and production.

Foodini is a 3D food printing kitchen appliance that personalises food, improves kitchen efficiency, and lowers food waste.

**Moto: "Real Food, Freshly Printed"**

## Benefits



Express Cooking  
Creativity



Internet  
Connected



Multiple  
Ingredients

## Support and Partnerships

ACCIÓ



INDUKERN



EIT Food is supported by the EIT  
a body of the European Union



## Case Study: Dysphagia Easing by 3D Printing Easy-to-Swallow Food

The prevalence of dysphagia (difficulty swallowing) in the general population is 16-23%, increasing to 27% in those over 76 years of age. Dysphagia is usually caused by another health condition, such as a condition that affects the nervous system, such as a stroke, head injury, multiple sclerosis or dementia; cancer – such as mouth cancer or oesophageal cancer; gastro-oesophageal reflux disease (GORD) – where stomach acid leaks back up into the oesophagus. Children can also have dysphagia due to a developmental or learning disability, such as cerebral palsy.

### Problem:

People with dysphagia often need their food blended before eating it, but this makes many of their meals monotonous and tasteless. Food presentation is essential, but pureed food is not usually visually appealing. That could lead to poor eating and difficulties with recovery.



### Solution:

3D printing allows making visually appealing and tasty meals that are still easy to swallow, making meals more exciting. Foodini is a precision, intelligent kitchen appliance designed and developed to print almost any food with a high degree of accuracy. The company's designers and engineers have crafted a unique system that is hygienic, food-safe, and easy to set up, operate, and maintain. The perfect recipe of Design, Food and Technology. Foodini food is natural food made from fresh ingredients prepared before printing.

### Traditional treatments for dysphagia include:

- speech and language therapy to help people recover their swallowing with particular exercises and techniques;
- changing the consistency of food and liquids to make them safer to swallow;
- other forms of feeding – such as tube feeding through the nose or stomach;
- surgery to widen the oesophagus, by stretching it or inserting a plastic or metal tube (stent).

# Picnic: About



# Picnic®

Picnic

Headquarters - Seattle, United States



Industry - Food Processing



Number of employees - 10-50



**Picnic** is an innovator of food production technology and Robotics-as-a-Service (RaaS) solutions. Vivid Robotics, Inc. Picnic, has collected an experienced team of food and technology industry veterans to develop and provide specialized intelligent technology and exclusive solutions for the food service and hospitality industries. Picnic's Pizza Production System is the first automated pizza system designed for commercial kitchen retrofit or new installations, producing hundreds of custom pizzas per hour with chef-chosen ingredients and recipes.

## Major Service



Power  
to the User



POS  
Integration



Up-to-the-minute  
Monitoring



Small  
Footprint



Commercial-grade  
Hardware



No Build-out  
Required

## Support and Partnerships



**DRAPER  
ASSOCIATES**



**BRANDED  
STRATEGIC HOSPITALITY**

## Case Study: Picnic's Pizza Robot Helps Centerplate Steal the Show

Known as the 'global stage for innovation,' Picnic had a lot to prove going into the Consumer Electronics Show (CES) 2020 at the Las Vegas Convention Center. With CES attracting over 175,000 attendees, Picnic's client Centerplate had a lot of mouths to feed.

**1000s  
Fed**

**400%  
Demand**

**<1%  
Food Waste**

### Challenge:

Like many convention space kitchens, Centerplate was catering in a large venue with high demand. If they were going to add any equipment to their space – in the kitchen or on the show floor – it needed to be flexible, mobile, and have a small footprint. Picnic's challenge was twofold. First, satisfy Centerplate's need to make high volumes of quality pizza quickly. Second, entertain the audience of consumer technologists and the media covering the show.



### Solution:

One operator, one robot, one stadium fed. Picnic is the world's first automated pizza assembly station. It fits seamlessly into commercial kitchen makelines to help operators produce up to 150 consistent pizzas per hour. Picnic supports existing restaurants success by solving labour shortages, reducing food waste, increasing consistency, and delivering efficiency. The Picnic solution centres on improved hygiene, reduced costs, lower labour requirements, and production speed to help kitchens thrive.

# PricePally: About



# Pricepally

PricePally

Headquarters - Lagos, Nigeria



Industry - Retail



Number of employees - <10



**Pricepally** provides access to affordable, nutritious, traceable and secure food items in Africa's urban cities. Pricepally is a wholesale and sharing economy e-commerce platform that enables people to buy food in bulk or share items with others online to leverage their collective bargaining power. The food is sourced directly from farmers and wholesalers, making it cheaper and fresher than buying at retail outlets.

## Benefits



Dedicated Service



Free Return



Online 24/7

## Partners & Media



## Case Study: Providing access to affordable food in the Covid-19 Pandemic

According to the Nigerian Communications Commission, approximately 91 million Nigerians use the Internet. That's more than fifty per cent of the population, which provides a huge market for internet providers and intense competition. In the last five years, data costs have dropped drastically. Back then, prices were three to four times higher than they are today. That enables technology-driven solutions provided by IT startups.

However, according to preliminary calculations by the World Bank, economic activity in sub-Saharan countries shrunk by 3.3% in 2020. Despite the pandemic, many African startups are thriving. The total venture capital for African startups grew to \$1.31 billion (€1.08 billion) in 2020, up from \$1.27 billion in 2019, according to the think tank Briter Bridges.

### Problem:

The disruption to supply chains caused by Covid-19 has prompted an acceleration in Nigerian food inflation. Structural factors including a poor road network, lack of storage and conflicts between farmers and herders underpin the food-price problem. Figures released on 15 April 2021 show that Nigeria's annual inflation rose to its highest in more than four years in March, at 18.17%. The headline figure was driven by food-price inflation, which climbed to 22.95%. There's "no coordination" in the market at present. Nigeria's food supply chain needs to cut out extra layers that don't add value.



### Solution:

PricePally was started in 2019 after finding that his family's spending on food had constantly been rising. The platform connects buyers directly with producers, and individuals can either open a new order or join in with existing orders already placed. The system aims to deliver the food the next day. As Covid hits the continents, Africa has suffered disproportionately from the global economic depression caused by the disruption. Leveraging shared economy principles, Pricepally enables consumers to buy food and wholesale products online and share bulk purchases with other users for additional savings.

# Spoonshot: About



Headquarters - Saint Paul, United States	
Industry - Food Science	
Number of employees - 11-50	

**Spoonshot** is a food and beverage innovation intelligence company. Our core AI system, called Food Brain, understands the food development process end to end by leveraging the predictive power of AI and applying food science domain knowledge. Its food brain can detect consumer needs early, translate them into relevant trends, and map out the strategic innovation opportunities they present.

**Mission:** “Predict food and beverage innovation opportunities globally with unparalleled confidence”

## Spoonshot’s End-to-End Approach

Crawling food & beverage open data

Using Data Science to process unstructured data

Connecting the data dots using Food Science

Applying #foodbrain to many use cases

## Trusted by



A global F&B manufacturer commissioned Spoonshot to use the power of AI to chart the innovation roadmap for a diet centric lifestyle brand.

## Problem:

**To** provide an in-depth picture of one of the fastest-growing dieting trends, its market, as well as its consumers, their habits, motivations and lifestyles

**To** guide the strategic product development pipeline of our customer's lifestyle brand that caters to this emerging dieting trend.

## Method:

By analyzing over **15,000** data sources:

Over **3.5 million**  
**88,400+** users | social media posts from

**2.5 million** | product reviews

Nearly **4,000** | industry articles

**3,600+** | relevant products across all food and drink categories

**25,000+** | recipes relating to the diet

## Solution:



Analysis of internal and external factors driving the market



Category analysis



Comprehensive psychographic profiles of key user types



Product and brand benchmarking



Top ingredients that consumers craved



4 opportunities, each with our recommended product concepts

## Client Feedback

"The insights provided were in-depth and comprehensive. This data serves as an excellent tool for multiple teams across the organization as we define our future pipeline and refine existing project concepts."

## Mission

"Predict food and beverage innovation opportunities globally with unparalleled confidence."

# Wasteless: About



## wasteless

Wasteless

Headquarters - Tel Aviv, Israel



Industry - Food Science



Number of employees - 10-50



**Wasteless** is helping supermarkets and the planet fight one of their biggest problems – food waste. Wasteless provides an all-in-one solution to reduce food waste and increase perishable food profit by dynamically pricing items with a shorter expiration date at their optimal price point. At Wasteless, they are helping supermarkets, and online grocery stores recapture the total value of their perishable products and reduce food waste through AI-powered dynamic pricing. The company has offices in New York, Tel Aviv, London and Amsterdam, with operations throughout Europe and the US.

## Benefits



Management  
from GIS



Comprehensive  
communication



Predictions with artificial  
intelligence



Connect  
to other systems

## Partners and Clients

**ZORA**  
VENTURES

**SUSV**  
THE ACCELERATOR VC

**FoodX**

OCS-Office of the  
Chief Scientist  
MINISTRY OF ECONOMY

SLINGSHOT  
IGNITING ENTREPRENEURS

Angel  
FOOD  
SINCE 2006

## Case Study: Converting food waste into retail profits

“ Solutions don't have to be hard. Wasteless resolves every retailer's profound pain points of food waste due to expiration and sell by dates. Solutions can be elegantly easy.

- Ralph de Vries, Wasteless' VP Business Development

### Challenge:

Expiration dates cause almost all retail food waste. The value of a food item decreases as it gets closer to its expiration date, yet the price remains the same. There is no incentive for consumers to choose an older item over a later expiring product. For grocery retailers, food waste represents an \$18.2 billion opportunity. On average, the value of wasted food in retail is equal to double the profits from food sales roughly.



### Solution:

The Wasteless algorithm updates prices for items based on their expiration dates, giving consumers a lower price for products closer to expiring, effectively reducing the amount of food wasted and increasing close-to-expiration sales for retailers. Significantly reducing retail labour, such as shelf checks and pricing updates, Wasteless seamlessly creates pinpointed price reductions multiple times per day for all items – not just one – close to their expiration dates.



to average revenue



of overall store waste



of waste per product

# FoodTech Industry during COVID-19



DEEP  
KNOWLEDGE  
ANALYTICS



# Impact of COVID-19 on Food Industry



## Automating Food Production and Distribution

Process improvements are aimed at reducing production costs and conserving water, fuel, and fertiliser. Given the impact of COVID-19 on borders and worker flows, many firms invest in emerging technologies, further reducing the need for human labour.



## Applications for Social Distancing

A range of new tech start-ups has emerged in response to the changes in the consuming experience in restaurants and supermarkets. All features, such as 3D menus, call for assistance, contactless payments and facial recognition for verification, are designed to limit contact with others.



## Bioactive Compounds in Food and Beverages

Using bioactive ingredients, which are proven to be effective against COVID-19 in food and beverage formulations, can positively impact the safety of consumers and the marketing position of producers.



## Robots in Restaurants

Automating technologies could be poised to change the food preparation and dining experience fundamentally. Industrial robots work in concert with AI, thermal scanners, and lasers to chop vegetables, grill food or perform similar tasks.



## Antiviral Packaging

Using some bioactive compounds present in plant extract can prevent coronavirus entry into the host body by the destruction of the viral structure. Its persistence on regular plastic is 72 hours.



## Policy Concerns

Policymakers may consider incentivizing technology expansion in the food industry as it continues to hold the promise of making production and supply processes safer, more resource-efficient, and more productive.

# Food Industry Opportunities

SARS-COV-2, a respiratory virus, completely changed the scenario of food industries, whether in production, processing or packaging. Various research has been done on antimicrobial food packaging, but there is still a shortage in antiviral food packaging development. There is a great need to explore the antiviral food packaging incorporated with natural antiviral bioactive compounds to ensure food safety and sustainability, which will help prevent food systems in these challenging times of pandemics in the future.



**+140%**

the average increase in consumer interest in online grocery delivery in 2020 (vs 2019) across Europe.



**+53%**

the average share price increase of the biggest food aggregator services in Europe in 2020.



**+87%**

of Europeans are willing to pay less with cash in the near future.

## Digital Logistics

Providing an omnichannel approach for the consumer journey - from discovery to delivery - will be essential. More efficiency for businesses will mean improving digital logistics on the backend of supply chains. Data throughout the supply and delivery chain can close the loop within the B2B2C pipeline.

## Unique Dining Experience

Food industry companies that have more control over end-to-end consumer experiences through data strategy create opportunities for hyper-personalisation. This tailors to custom-made preferences, which contributes to additional revenue streams and consumer loyalty.

## Tech Solutions

Food industry companies that embrace tech-enabled efficiencies and cost-saving management tools are developing product and service innovation. Learning demand patterns and consumer preferences gives a forward-looking perspective on ways for brands to grow in the future.

# Startups Emerging During the COVID-19

Depending on their product or service, startups can be affected or a solution to the current situation. Due to startups' reactivity and innovations, many of their clients stay alive and improve edge against more conservative competitors.

## Who reacts:



### Delivery startups

restaurant delivery, marketplaces and meal kits which are thriving but are targeted by concerned customers by the safety of their workers and the social utility of their operations.



### Foodservice startups

providing hospitality businesses with payment and ordering services. These startups are put on hold, some switching to B2C, others facing dim perspectives.



### Direct-to-consumer food startups

The situation will depend on how well funded they already are and how strong their underlying trends were. If everything's ok for meat alternatives startups, it will be more complicated for far fetched concepts.

## How reacts:

- Shifting from a “growth at all cost” to a “profitability above all” paradigm (eg., cutting staff);
- Respecialization in B2C business (eg., prioritizing delivery);
- Transformation restaurants into grocery stores;
- Synergy different food market actors: such as restaurant as providers and supermarkets as distributors;
- Booming of Meal Kit segment, that otherwise has complicated future;
- Companies already involved with robots and drones are moving their experiments into the streets at the delivery food to consumers.

# Trends and Obstacles



DEEP  
KNOWLEDGE  
ANALYTICS





## Trends

### Digital Food Management

Big data analytics, AI, real-time monitoring enable companies to develop food management solutions to optimise manufacturing processes and supply chain operations. Customer and market intelligence allows brands to optimise their marketing strategies and effectively reach the relevant audience, boosting sales.

### Personalised Nutrition

Consumers desire to understand how dietary habits affect it. 3D printing and the adoption of robotics in food assembly lines allow food companies to provide nutrition personalisation at scale. In addition, various tracking devices allow users to track their diet and health conditions to streamline their diet.

### Productivity Growth

For the last few decades, agriculture has been focused entirely on increasing yields to meet the global goal of zero hunger. The progress achieved was significant. The market demand pushed farms to professionalize, become more prominent and focus on producing highly productive crops in their area.

### L.A.T.T.E Consumer Trends

Consumers have the highest power in the value chain. Their preferences are switching to healthy food, and they prefer L.A.T.T.E (local, authentic, transparent, traceable, ethical) grown food. Farmers must prove that the food they produce is fully grown in line with sustainable agricultural practices.

### Traceability and Transparency

Consumers' desire for transparency in the food chain is at the heart of the growing demand for natural, traceable ingredients products. Blockchain and real-time food monitoring using the Internet of Things (IoT) devices enable us to offer both traceability and transparency to customers.

### Low-Carbon Technologies

Producers are focusing on technologies with fewer greenhouse gasses emissions. The continued release of greenhouse gases can cause further warming and long-lasting changes in the climate system. The food system accounts for approximately 26% (13.6 B tons) of global greenhouse gas emissions.

### Nutraceuticals

Consumers are focusing more on eating healthy, making nutraceuticals a top emerging trend in the food industry. These include nutritional supplements, functional foods, medicinal food, and gut microbiomes enhancement foods such as prebiotics, probiotics, and postbiotics.

### Land Surface Efficiency

Additional novel solutions must be sought in new concepts of food production like vertical indoor farms that produce much more output per surface, lab-grown meat that is grown in an entirely ethical, transparent and traceable way, insects as a significant source of protein and others.

# Obstacles for FoodTech



## Obstacles

### Health-Consciousness

The increasing incidences of food-related disorders have prompted consumers to bring about vital changes in their diet and lifestyle, making them more health-conscious than ever. The need to eliminate artificial constituents from products is one of the major challenges faced by food and beverage managers.

### Traceability

Traceability is one of the pivotal challenges in food and beverage industry. Consumers have been taking increasing interest in formulations of food, that has led 'ingredient labelling' forming a major part of the packaging process. Furthermore, deploying advanced technology, such as IoT, AI, and the blockchain is complex and cost task.

### Sustainability

An eco-friendly product has more of a consumer connection and is likely to make lucrative sales than a product that harms the environment. FoodTech companies are now competing toward making the food manufacturing process highly environment friendly through the adoption of numerous recycling practices.

### Regulatory Landscape

While most companies are known to perfunctorily adhere to the norms, the periodic changes subject to waste disposal, food quality, raw material, surplus production, documentation, etc., have cropped up to be one of the crucial challenges faced by FoodTech companies.

### Low-Carbon Agritech

There is a need for the implementation of low-carbon technologies in agriculture and food industries due to climate change. The most significant barrier is a lack of technologies or side effects, such as animals gaining weight after usage of methane-inhibiting additives.

### Safety Standards

Ensuring that safety standards are upheld in the industry is crucial to maintaining the high level of trust that consumers have in food manufacturers presently. This includes making sure that both the food is safe and that the people are looked after too. Food producers need to control safety according to new regulations.

### Veganism

With the increasing number of vegan, the demand for meat has witnessed a decline. FoodTech companies need to maintain their reputation with regards to ethical treatment of animal concern. As a result, companies have come up with meat-free alternatives to keep the retail and supply chains running.

### Online Visibility

Unlike e-commerce companies, food and beverage companies are still lagging when it comes to analysing their online presence. With the emergence of the newer market, changing nature of consumer spending, and advancing technology, it is high time for companies to focus on marketing products online.

# Top-5 Investment Trends

## Five Venture Capital Trends are shaping the European Food Tech Ecosystem



### **Food Delivery: Online ordering platforms for food delivery services.**

The delivery services business is booming – not just since the pandemic. VC investments in food delivery have created the first wave of European unicorns (startup valuations over \$1B).

### **Innovative (D2C) Food Brands: Food brands with innovative ingredients or distribution channels.**

In line with an online-first approach, startups generally build a loyal customer base via their direct-to-consumer stores. The importance of traditional retail is only secondary. The step onto the supermarket shelf is only taken after successfully ensuring a product-market fit.

### **Alternative Proteins: Startups in the field of plant- and cell-based proteins.**

The future will combine more sustainable protein sources to replace animal products while still providing nutritious products. Additionally, to future of protein diversity will also develop cell-based products.

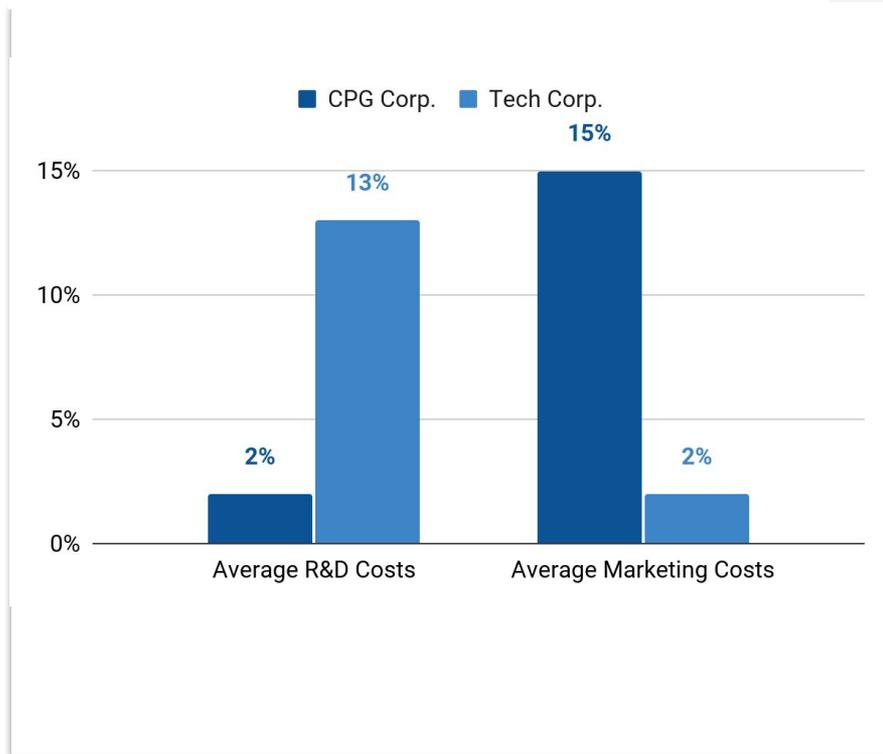
### **eGroceries & Meal Kits: Online supermarkets and cooking box sellers.**

### **Farm & Production: Resource-friendly cultivation and efficient processing.**

More than half of the global population lives in urban areas. This share is expected to increase to 68% by 2050. The development of local production capacities (e.g. through vertical farming) will thus become vital.

# Motivation for Corporate Collaboration

## Big Consumer Packaged Goods Corporations Barely Invest, Unlike Big Tech Corporations



Big brands traditionally have little incentive to change, facing constant shareholder pressure against increasing risk. 2018 saw food and beverage corporations in the US invest only \$6.9B in R&D compared to \$268.8B in technology (Nick Skillicorn, Ideas to Value, 2019).

According to a report Circle Up released in 2017, the most significant CPGs invest an average of about 6x more in marketing and advertising than they do in R&D, with R&D accounting for a mere ~2% of revenue investments. In tech, where product innovation is front and centre, R&D and marketing/ads investment is nearly the opposite.

Since R&D has historically been an afterthought for significant CPGs, it's no surprise that even today, when facing severe external pressures, giant CPGs aren't having the easiest time whipping out exciting new tricks. On average, amongst the most significant CPGs, only 39% of launches are new products. The other 61% of the time, the product launch is usually an incremental change, like new packaging, a new range extension, formulation or variety, or a relaunch.

# Urban Agriculture as an Emerging Trend

Technology allows more compact agricultural infrastructure for growing food where the people are. Utilising of digitization and automation can take the industry to the next level of productivity.

## Automated Vertical Farms



Higher Productivity per square



Lower Transportation Costs



Fewer Carbon Dioxide Emissions



Lower Water Consumption / Drought Preservation

## Aquaponics



Fish converts their food into nutrients for plants, while plants filter and clean water for fish



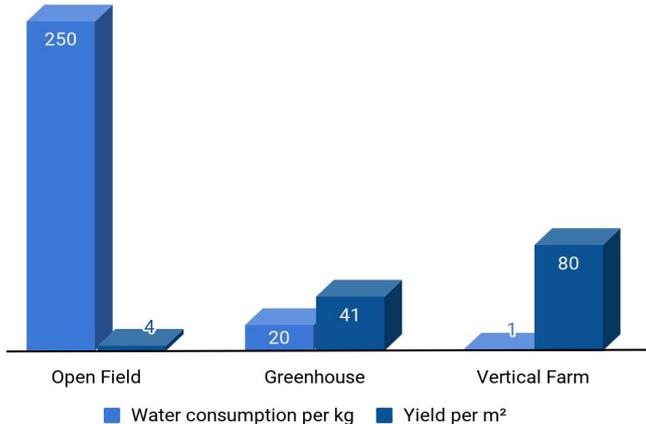
Reduces uses of water by half



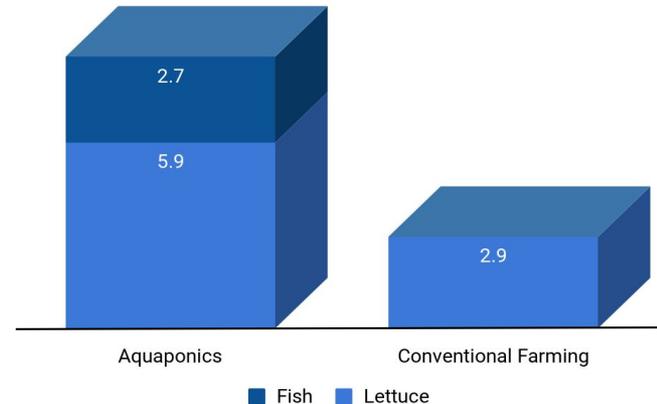
Increases amount of grown plants



## Efficiency of Technologies



## Productivity of Two Technologies



# Agri-Food Industry as the Most Rapidly Developing Sector

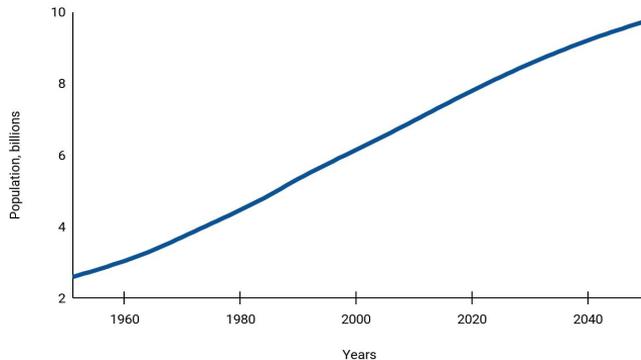
## Agri-Food Industry Analysis

### Challenge:

By 2050, the global population is expected to increase to 10 billion people. The UN Food and Agriculture Organization (FAO) predicts that the agriculture industry will need to produce 70% more food without increasing the land surface to feed the increasing population.

The need for additional food, coupled with growing environmental and regulatory pressures, presents a challenge for the global farming industry.

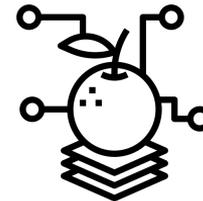
### Population Growth Predictions



### Solution:

People need to surpass this challenge and ensure food for all populations in less than 30 years.

The digital agriculture revolution can provide the solutions to the problem of feeding the world sustainably. Although the progress driven by the agritech development is substantial, it will not be sufficient alone to solve the entire global food problem. Additional novel solutions must be sought not only in increasing productivity but also in new concepts of food production like vertical indoor farms that produce much more output per surface, lab-grown meat that is grown in an entirely ethical, transparent and traceable way, insects as a significant source of protein and other.



# Alternatives to Animal Protein (1/2)

Using advanced machine learning algorithms and biotechnology techniques for developing cultured 'animal' products or plant-based copies. Novel approaches in searching for protein through animal species. All options could help tackle two of the world's biggest problems at once: food insecurity due to population growth and the climate crisis.

## Trends in the Industry of Alternative Food Sources

### In Vitro Meat

- Methane and nitrous oxide emission is much lower. However, carbon dioxide release is higher.
- Cultured meat will need less land than conventional meat production. However, livestock plays a crucial role in maintaining the soil. Therefore impact is ambiguous.
- Animal welfare is another focus of concern in some parts of our modern society. The number of slaughtered animals can be reduced significantly.
- The price of cultured meat significantly decreased. However, it is still much more expensive than traditional meat with a 10x difference.

### Plant Based Protein

- Plant protein powder contains antioxidants, vitamins, nutrients, and omega-3 fatty acids.
- It is higher in fibre and generally digests more quickly than dairy or meat.
- However, plant proteins are often incomplete proteins, and therefore should be consumed in combination to serve as a complete protein.
- Plant protein powders are ideal for vegetarians and vegans who may not get enough protein through the whole foods they consume.
- Plant protein powders are typically more expensive than whey protein.

### Insects as a Protein Source

- Farming insects worldwide would free up land that is currently used for farm animals.
- However, eating plant protein is a more sustainable option, as less energy is used to grow the plants than raise insects.
- Insects are 12 to 25 times more efficient at converting their food into protein than animals.
- Insects could provide an essential source of nutrition in developing countries.
- Despite the strong sustainability nutritional value, people are sceptical to novel foods such as insects.

# Alternatives to Animal Protein (2/2)

Investments in alternative proteins are at an all-time high. However, the perception of sustainable proteins is highly related to social and cultural traditions.

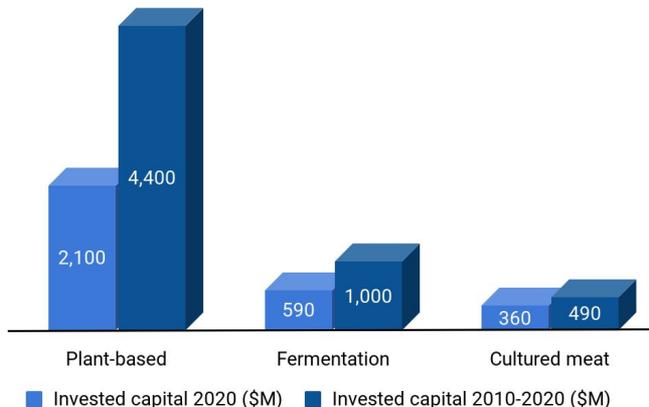
## Investments in Alternative Proteins Industry

Alternative protein companies have raised almost \$6 billion in investments in the past decade (2010–2020), more than half of which was introduced in 2020 alone. \$3.1 billion in investments in 2020—three times more than in any single year in the industry’s history.

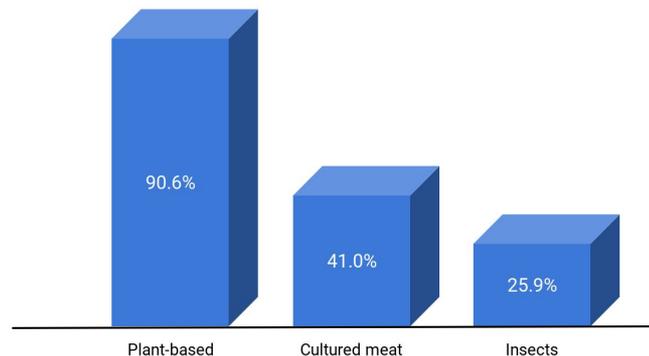
## Meat Substitutes Embranchment

Despite environmental friendliness, health and nutrition reasons, many people reject the idea of protein alternatives. The most common personal barriers are neophobia and the perception of substitutes as too unnatural and artificial. The most preferred alternative for personal consumption is plant-based for these reasons.

## Investments in Alternative Proteins



## Acceptance of Meat Substitutes



# Predictions and Conclusions

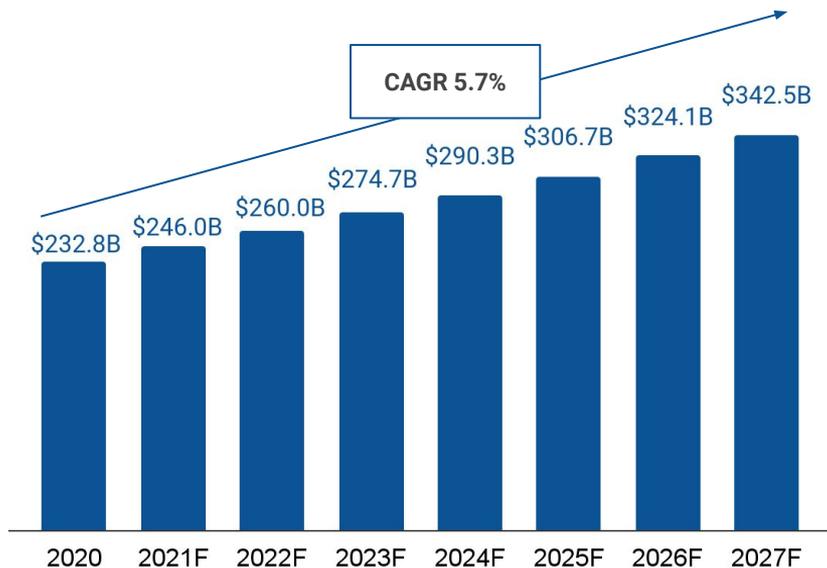


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# Predictions of the FoodTech Industry Development

## Development of the Global FoodTech Market



The global FoodTech market is expected to grow with a CAGR of 5.7% and reach a value of **\$342.5B** by 2027. This high growth can be attributed to the increasing penetration of the Internet and smartphones in developing economies.

## Key Takeaways

Increasing **utilisation of advanced technologies in food processing techniques, innovations in robotics, and data technology** are creating new growth opportunities in the FoodTech market.

Rising awareness among the health-conscious population is strengthening the demand for healthier foods. Factors such as **demand for more and higher quality products**, reduced availability of staff and higher wage costs, and the reducing price of technology are expected to stimulate the advancements of the FoodTech market in the future.

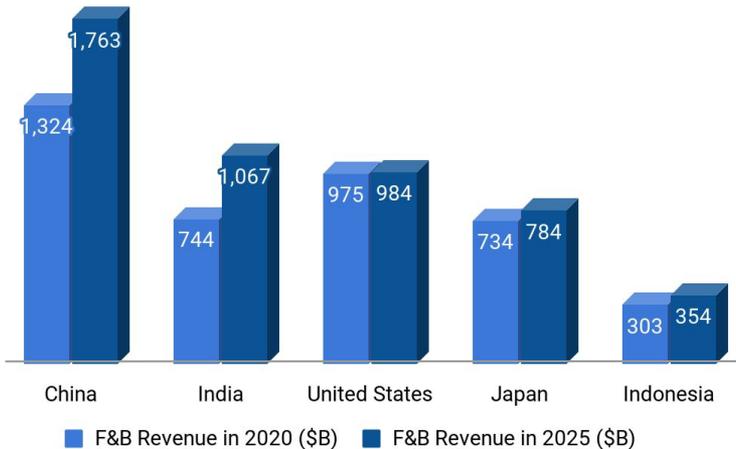
In 2021, about 67% of consumers will seek more in-depth information about products to help drive their purchasing decisions. As a result, **FoodTech companies need to demonstrate the efforts generated into sustainability credentials to consumers. North America is estimated to contribute more than 38%** to the market's growth. The countries in the region are concentrating on developing their chemical infrastructure. The concentration of leading markets combined with the growing demand for oil and chemical products will boost the need for FoodTech in the region.

# Predictions of Top Countries Revenue and Online Share

## Top 5 Countries by F&B revenue

The Asia Pacific dominates the food market. China, India, Japan, and Indonesia are the key markets in the region. The growth of e-commerce and online retail has positively impacted China's market. Similarly, India has massive potential in the area and is estimated to overtake the United States by 2025.

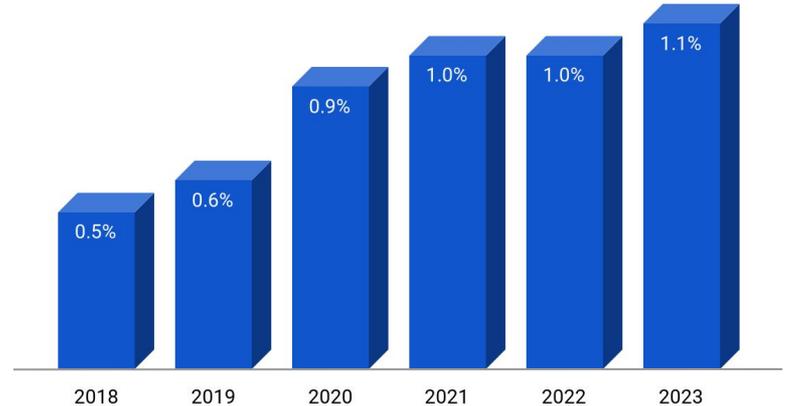
### Estimated F&B Revenue Growth in 2025



## F&B Online Revenue Share

Even though the contribution of online share to F&B total revenue is insignificant, it showed growth by third in 2020. While the rising pace in online retailing will slow from 2021, it will continue to grow gradually to nearly 1.1% by 2023.

### Estimated Growth of Online Revenue Share, %



# Leading Paradigms in Food Industry

## Five Groups of Trends are Expected to Move the Food Industry for Next Decade

### Population Changes

Population changes include aging and an increase in life expectancy, a decrease in the birth rate and migratory flows. These trends have remarkable impacts on countries' economic and social structures. Specifically, the rebalancing of society and population will significantly affect the way people nourish themselves.

### New Geopolitical Balances

The most recent geopolitical changes and the emergence of megacities indirectly impact dietary trends and new distribution ways. It is predicted that in 2050, the world's population will reach nine billion people (+32.4% since 2010), and 70% of the world's people will live in cities.

### Technological Innovations

New technologies, digitalization and automation – especially in energy, information, and sustainability – will play a fundamental role in evolving socio-economic changes, including the future dietary scenario.

### Focus on Environmental Aspects

F&B industry will be highly driven on increasing responsibility for the protection of the environment. The severe water stress, the production of electricity that depends too much on fossil fuels, and the severe risk of biodiversity loss are factors raising the growing alarm regarding environmental sustainability.

### Connectivity and Information

The enormous availability of data and information that can be found today, more freely, in real-time and with new methods, is a positive result of the significant changes underway. This will affect many potential developments in the food industry, supply chain management and safety control.

# Future Technologies in Food Industry



## Technologies that improve the productivity of agricultural systems

- Automation of processes using innovations of engineering and information technology
- Digital management and implementation of AI and big data analytics
- Molecular markers in plant breeding. Genomics in the cultivation of needed traits in livestock



## Technologies and practices that improve the sustainable use of inputs

- Technologies with fewer greenhouse gasses emission
- Innovative approaches for increasing land surface performance
- Increasing water use efficiency of crops and novel methods of water purification



## Technologies that improve the health and wellness qualities of food

- Food as a vehicle for drug or biological delivery systems
- Customised biological tests, data collection, and analysis for developing personalized diets
- Nutrigenomics for diet customization and preventing diet-related diseases



## Food processing technologies

- Modifying packaging materials on a molecular scale
- Novel and advanced biotechnological tools for cultured meat production
- Microbial transformation for further usage in fermentation processes

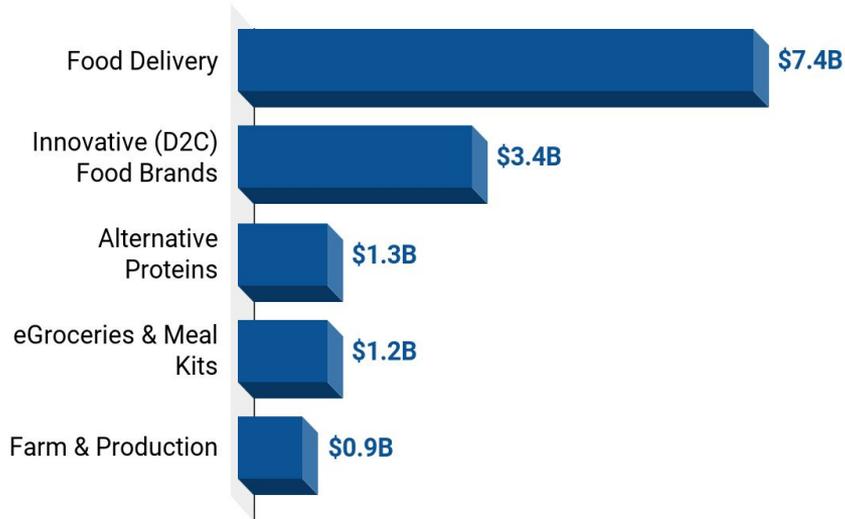


## Food safety and supply chain management technologies

- Blockchain and real-time food monitoring using the IoT devices
- Real-time sensing of pathogens and biosensors for rapid detection of viruses
- Implementation of technologies for reducing the number of artificial constituents in food

# Conclusions

## Five Venture Capital Trends that are Shaping the European Food Tech Ecosystem: Revenue, \$B



The Global FoodTech Market Size was **\$220.3B** in 2019. With advancing technologies within the food industry and a demand for healthier, cheaper, and safer food products, the FoodTech market could reach a turnover of **\$342.5B** by 2027.

The most significant amount of FoodTech companies is located in **the United States**. The food industry is developing rapidly, with the increasing number of startups in the country. **The United Kingdom** and **Israel** follow the United States.

Almost a half of investors are located in North America. The second richest on investors region is Europe with 42% of share according to the analysed in the report companies. The Top-3 countries by the number of investors are **United States** (39.52%), **United Kingdom** (9.94%) and **Germany** (6.23%).

COVID-19 has completely changed food industries: production, processing or packaging. More efficiency for businesses means improving digital logistics on the backend of supply chains and developing novel technical solutions for products and services.

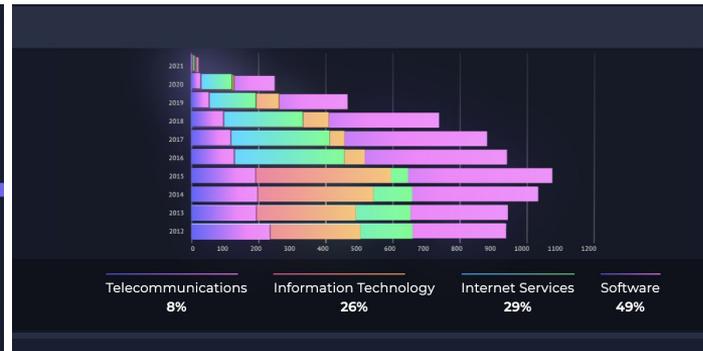
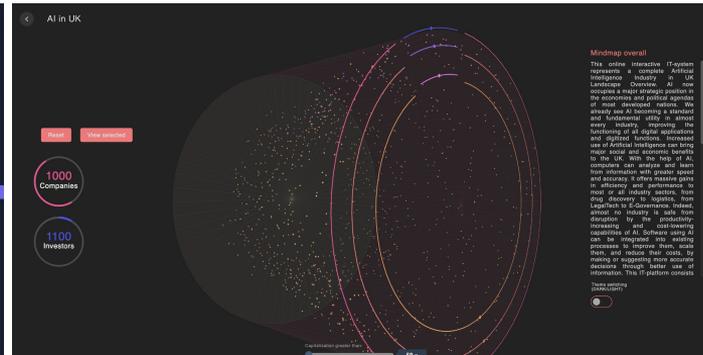
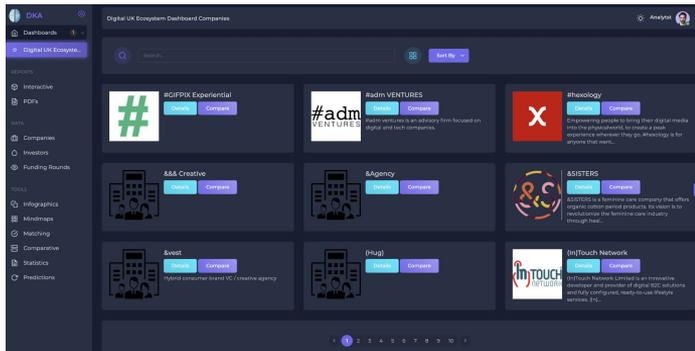
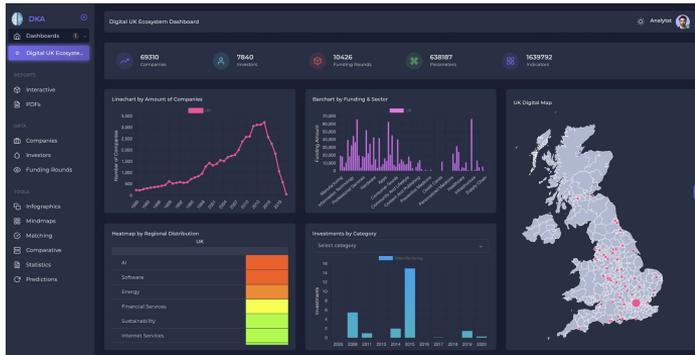
The most popular technological innovations aim to increase the **productivity** and **sustainability** of agriculture and food production systems. **The health** and wellness qualities of food and its **safety** are vital factors of consumers' choice.

# The Technology Revolution of FoodTech Industry Conference



# DKA Digital Platform Concept

The Digital platform provides an opportunity to monitor digital industry growth in dynamics. In addition, the platform presents geographical data analytics visualizations, advanced 3D MindMaps and charts. Overall, it maintains a unique method in market research and forecasting, as well as trend visualization.



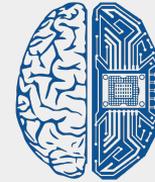
# About Deep Knowledge Analytics

[Deep Knowledge Analytics](#) is a DeepTech focused agency producing advanced analytics on DeepTech and frontier-technology industries using sophisticated multi-dimensional frameworks and algorithmic methods that combine hundreds of specially designed and specifically weighted metrics and parameters to deliver sophisticated market intelligence, pragmatic forecasting and tangible industry benchmarking.

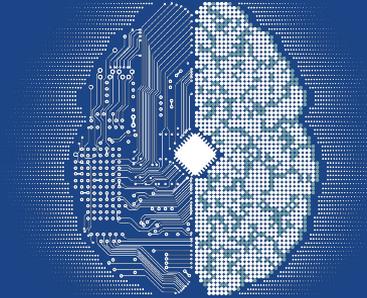
It is an analytical subsidiary of [Deep Knowledge Group](#), an international consortium of commercial and non-profit organizations focused on the synergetic convergence of DeepTech and Frontier Technologies (AI, Longevity, MedTech, FinTech, GovTech), applying progressive data-driven Invest-Tech solutions with a long-term strategic focus on AI in Healthcare, Longevity and Precision Health, and aiming to achieve positive impact through the support of progressive technologies for the benefit of humanity via scientific research, investment, entrepreneurship, analytics and philanthropy.

Deep Knowledge Analytics specializes in conducting special case studies and producing advanced industry analytical reports on Artificial Intelligence, GovTech, Blockchain, FinTech and Invest-Tech. It has made many comprehensive analytical reports in coordination with the [UK All-Parties Parliamentary Groups on AI](#) and [Blockchain](#), including its AI in UK Landscape Overview 2018 and Blockchain in UK Landscape Overview 2018, unprecedented in their scope and length and collectively more than 3,000 pages. The company has also recently deployed advanced interactive online IT platforms that feature dynamic mindmaps and filterable, customizable databases updated with new industry developments in real-time.

Deep Knowledge Analytics will continue to expand the scope, depth and topics covered by its analytical reports on frontier technology-driven industries, to develop the subsequent iterations of their analytical frameworks with a broader breadth and depth of metrics and overall analytics, to apply efficient methods to cross-sector analysis between different industries, and to apply both existing and new analytical frameworks to the design of the new Invest-Tech solutions (novel investment technologies and strategies relevant for the third decade of the twenty-first century), which is the only suitable way to implement the long-term strategic vision of Deep Knowledge Ventures.



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**Link to the Report:**

**[www.dka.global/global-foodtech-landscape-overview-2021-q4](http://www.dka.global/global-foodtech-landscape-overview-2021-q4)**

**E-mail: [info@dka.global](mailto:info@dka.global)**

**Website: [www.dka.global](http://www.dka.global)**

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