TOMORROW'S TASTE

ALTERNATIVE PROTEINS
Fermentation

A glimpse beyond known

UNKNOWN GROUP June 2021
Dear reader,

At Unknown Group, our mission is to fuel founders to answer their calling by venturing beyond known. We’re driven to support unconventional solutions in turning the world’s problems into opportunities. One of our many focus areas is the domain of Alternative Proteins, which we see as essential to help attain the UN Sustainable Development Goal 2 – Zero Hunger.

As we search the world for the next big thing in this domain, we discovered innovators developing ground-breaking ingredients, products and technologies for alternative protein. Their products mimic the cooking and eating experience while preserving color, aroma, texture and flavour. We engaged with founders in developing approaches that could improve juiciness, mouthfeel and processes for meat replacement production.

This report is a glimpse into the world of alternative protein, more specifically into the fermentation processes and technologies. Seeing the future from the founders’ perspectives and identifying the most innovative startups worldwide is where we excel.

We hope this report takes you on a journey into the unknown, as you discover the bold solutions determining the future of food. Venturing with Unknown Group you will be able to foresee, identify and promote the best approaches to deliver tasty, healthy, sustainable and accessible food for all.

Will you shape the future with us? Because the future is unknown, until we say it’s not!

On behalf of Unknown Group,

Willem Knaap
Global Director Food & Agri
www.unknowngroup.com/tomorrows-taste
willem.knaap@unknowngroup.com
Growing awareness around climate change as well as increased consumer demand for healthier nutrition have made alternative proteins a central topic to any conversation around the future of food. The way a plant-based diet can benefit our health and protect animals, while positively impacting the future of our planet has led to large upswing in the number of meatless alternatives in the market.

This reading will be an eye-opening experience for all of you visionaries and changemakers out there, to encourage you to direct your attention towards healthy alternative protein solutions.
GLIMPSE INTO THE FUTURE OF FOOD THROUGH FOUNDERS’ EYES

“At the moment fermentation offers many advantages in the plant based food production. This is why now and in future, more and more companies will adopt fermentation in their processes”
- Ramkumar Nair

“As the next billion people are coming onto the planet, we need to look for alternative solutions to continue feeding people the food they are used to. Emerging technologies are enabling just that.”
- Fengru L.

“The future of the food industry is in better products: healthier products with lower footprint that taste at least as good as existing food products. Today, more than ever, we understand it is crucial for us to make our food industry more sustainable for both planet and humans..”
- Dror Tamir

“For centuries food has been fermented e.g. cheese, bread and alcohol and now after all these years of experimenting, we can implement this knowledge into microalgae technology to create a sustainable future and feed our planet.”
- Majbritt Byskov-Bridges
Peeking at the road towards improved and globally adopted alternative proteins, we can explore and visualize different steps:

- We see ventures worldwide working with a variety of inputs such as algae, fungi, heme, soy and other basic ingredients to produce plant-based proteins via the process of **fermentation**.
- Alternatively, processes have been developed such that nutrients can be **extracted** from protein-rich insects, such as grasshoppers, and crickets.
- Another process is **cultivation** which enables the preservation of the aspect and taste of real meat by growing animal muscle and fat cells in vitro. Yet to be scaled to its full potential owing to its large costs, but more affordable ways are in development.
- Some intermediary steps before the product reaches customers include the enhancement of flavour, texture and overall aspect of alternative proteins by adding binding agents, nutrients, flavor enhancers, but also by using **3D printing** technologies to reproduce the fibrous structure of meat, as well as **encapsulation** to preserve freshness or deliver a tasty and savory product.

Overview of alternative protein processes and approaches. Unknown Group [i]
THE FUTURE IN TERMS OF FERMENTATION

Diving into the domain of fermentation, we can explore how startups have developed innovative processes that use mushrooms, algae and heme as ingredients to produce alternative proteins, with the goal of conferring the characteristic ferrous and savory taste of meat.

The development of fermentation processes has now taken a central role in plant-based food production, and presents countless opportunities for food innovators.

Fermentation has the potential to become the next frontier for alternative proteins

**FUNGI/MUSHROOMS**: Mushrooms are a valuable source of vitamins and minerals. Their meaty texture and savory flavour makes them an ideal candidate for meat substitutes.

 KERNEL MYCOFOOD: KERNEL is improving fungi fermentation techniques to create a more sustainable, cost-effective and flavor neutral protein ingredient that can be tailored to feed the world in a more conscious way.

“*I see lots of companies trying hard to mimic meat and other food instead of really thinking of the future of food, taste, form factor, idiosyncrasies etc*”

HORACIO ACERBO
CEO

**ALGAE/SEAWEED** are increasingly being consumed for functional benefits such as lowered risk factors for heart disease and improved blood sugar management.

 Sophie's Bionutrients: Developing a new sustainable plant-based protein out of microalgae. The proprietary strain of microalgae can grow in a fermentation tank, be fed on by various food waste.

“*Status quo is not a cure, doing less harm is no longer enough. Unlocking macro-nutrients at the micro-level is the only way forward*”

EUGENE WANG
CO-FOUNDER & CEO

**HEME**: Considering that heme is the most readily absorbed form of iron in nature, we should consider it to be an essential nutrient for humans’ health!

 Back of the Yards Algae Sciences (BYAS): BYAS is working to find new uses for algae as sustainable, natural ingredients for food colorants and flavors. Recently, developed a “unique seafood flavouring” using its algal heme technology.

“*BYAS is committed to researching, developing and implementing new ways of making our food better, more accessible and healthier and to reducing the environmental burden of food production on our precious planet*”

MARC PETER GEIJTENBEEK
Co-Founder & CEO
FERMENTATION OFFERS REVOLUTIONARY BENEFITS

Looking at the inputs for fermentation processes, there are other options than fungi, algae and heme. Often overlooked, resources such as peas and beans are increasingly solidifying their presence in the market, alongside the already popular protein of soy. Read below about their nutritional and health benefits and the potential they have to hugely limit the environmental impact caused by the food industry and revolutionize food systems for good.

SOY: Soy products are becoming increasingly more popular, and considered to be a great replacement for animal protein as they deliver plenty of polyunsaturated fat, fiber, vitamins, and minerals, and are low in saturated fat.

**THIS**: This is a company that makes plant-based food mainly out of water and soy protein, targeted at meat lovers. THIS products have a longer shelf-life than meat to help reduce food waste.

“We believe that beans are the key-ingredient in the protein revolution. We go from canned storage food to delicious future food!”

**BOON**: With product innovations based on traditional Dutch beans, BOON wants to entice consumers to eat more plant-based foods. BOON is full of protein, fiber and healthy nutrients, but above all it is very tasty. In addition to being nutritious, beans are also very sustainable and have a small footprint.

“We believe that beans are the key-ingredient in the protein revolution. We go from canned storage food to delicious future food!”

PEAS: Peas contain a lot of protein and iron, and they are low in fat and carbohydrates and are a good source of vitamins C, E, zinc, and other antioxidants which strengthen your immune system.

**MEATLESS FARM**: The start-up developed plant-based mince, burger patty and sausage loaded with taste and texture. The company is meat free, not taste free, and the mission is to help people reduce their meat consumption by making swapping to Meatless easy.

“The goal is to create meat alternatives that are incredibly tasty, healthy and high in fiber. Our pea protein based products are free from soy and gluten which is not only nutritious, but also good for the environment and animals. On average, production produces 95% less CO2 emissions than meat products.”

**ANDY SHOVEL & PETE SHARMAN**
CO-FOUNDERS

**MICHAEL LUESINK**
FOUNDER

**STEF TRAA**
BUSINESS DEVELOPMENT MANAGER EUROPE
ONE GLOBAL ECOSYSTEM, COUNTLESS SOLUTIONS

Globally we can observe how fermentation is being used to solve numerous food-related challenges more sustainably and more efficiently. By exploring the food startup ecosystem worldwide, we discovered a myriad of groundbreaking solutions in the domain of fermentation alone. In such a competitive setting, new innovative technologies are around the corner and awaiting to scale. Currently, the fermented proteins are produced largely in Northern America and Europe. With the rise of the internet of things, the Asia Pacific and the Latin American market is creating a huge demand for alternative proteins. And hence an increasingly higher demand can be expected for fermented protein in future.

Meati Foods uses proprietary, clean technologies to provide nutritious, fungi-based protein.

Chromologics uses fermentation for the synthesis of natural colourants.

Zhenmeat is working to improve nutrition in China by introducing fermented meat-alternatives.

TurtleTree is driven to develop the best nutrition from milk in the most sustainable way.

Willcroft produces plant-based cheese through fermentation.

Modern Meat produces a portfolio of plant-based products including meat and dairy products.

The New Butchers produce vegetable meats made from pea fermentation.

Kernel MycoFood uses AI and computer vision to improve the fungi fermentation techniques of existing and approved strains.

Meatless Farm develops plant-based meat alternatives with taste and texture.

Alver grows chlorella through a natural fermentation process for protein.

Mycorena produces vegan protein using fungi technology.

CHUNK produces plant-based whole-cut foods as meat alternatives.

Mushlabs uses fermentation to generate sustainable foods from the roots of mushrooms.

Kernel MycoFood uses AI and computer vision to improve the fungi fermentation techniques of existing and approved strains.

Meatless Farm develops plant-based meat alternatives with taste and texture.

Alver grows chlorella through a natural fermentation process for protein.

Mycorena produces vegan protein using fungi technology.
This glimpse into the future of food shows us that interest in protein alternatives has increased significantly in the last decade, for a variety of reasons including the growing awareness around climate change, the need to feed our growing global population, and increased consumer demand for healthier nutrition.

**A GLIMPSE INTO THE FUTURE**

This glimpse into the future of food shows us that interest in protein alternatives has increased significantly in the last decade, for a variety of reasons including the growing awareness around climate change, the need to feed our growing global population, and increased consumer demand for healthier nutrition.

**FOUNDERS’ VISION**

The founders have spoken. While working on new groundbreaking technologies worldwide they say the future of food lies in innovations related to fermentation processes, alternative proteins like grasshoppers, and microalgae. Their nutritional and health benefits and their potential to hugely limit the environmental impact will shape the future of the food industry for the better.

**INDUSTRY TRENDS & SUMMARY**

We identified trends in the food industry happening worldwide. In this report specifically, we dove into fermentation technologies involving algae, fungi, heme, soy, and more, as inputs to create alternative protein solutions.

We engaged directly with the founders and discovered more about each input within the fermentation processes and more. We went beyond known to see the future more clearly. We see however, that challenges in this sector are around the corner when developing alternatives to animal-derived proteins, especially when it comes to scalability.

This is where we, at Unknown Group come in, we scout the venturers with the most innovative and promising technologies and together we find the best ways to help them scale up their solutions to impact the future!
We see that founders turn the world’s problems into opportunities by creating solutions beyond known.
Together with industry leaders we tap in to this potential and bring solutions to scale.

WE CONNECT YOU TO PROMISING VENTURES
Emerging ventures from around the world are the ones to bring new products, technologies, business models and talent into the food industry. However, to make an impact, they need to bring their solution to scale!

HOW? With access to funding and access to market. At Unknown Group, this is exactly what we provide, we invest in ventures and connect them to industry leaders, providing them with a head start in their development.

- Inhouse technology with 
  1.7 M venture profiles
- 300+ referral partners
- 60+ business intelligence team

THE UNKNOWN TOMORROW’S TASTE VENTURE ENGINE®
Creates funnels of emerging ventures around the world, in strategic domains relevant to you.
We enable Industry Leaders to collaborate with ventures to create bottom line results, and together make a lasting impact on the food we all eat!

SPEED Gain development time
DE-RISKING Venturing at arm’s length
INCREASE SUCCESS RATE Portfolio approach

REACH OUT TO LEARN MORE ABOUT HOW WE CAN HELP YOU!
ABOUT UNKNOWN

Unknown is an early-stage venture capital and business development firm, supporting founders and industry leaders to successfully bring innovations to the market: a “Venture Engine®”. With a fresh approach delivering venture success, lining up the industry and creating a pool of solutions ready to be adopted by the market.

CONTACT

Jeroen van den Bosch
E: jeroen@unknowngroup.com

Willem Knaap
E: willem.knaap@unknowngroup.com

The Hague (HQ)
SoZa, Building H0 & I0
Anna van Hannoverstraat 4
2595 BJ the Hague, NL
Disclaimer

The views and opinions expressed in this publication are those of the authors and are subject to change. This publication does not constitute investment advice and reliance upon the report for this purpose is at the reader’s discretion. Any mention of specific products or services in this report does not imply endorsement by Unknown Group.

© Unknown Group 2021

Authored by

UNKN    WN