

Algaenite Protein is a new company established as a spinoff of Algaenite.

- *Third-Generation Farming, protein farms*
- *Ideal Desert Farming*



**Technology Funded by an EIC
Accelerator Horizon 2020**



Introduction – How we feed the future generations

Carbohydrates (Carbs) Production: Requires Carbon, Hydrogen, Oxygen, and energy from the sun. (Carbs are 50% of our diet)

It's called photolysis or carbon capture. Green plants do it. **But we can't live on carbs only!**

Protein Production: Requires nitrogen (16% of the protein) In addition to carbs. (Protein is 20% of our diet)

For cells to make amino acids and then protein, the nitrogen supplied needs to be “fixed” - in **ammonia** form.

Only a few species of bacteria can “**fix nitrogen**” and make ammonia from the air for the production of protein.

Nitrogen can also be fixed in the Haber Bosch chemical process, but we don't want that.

Algaenite uses a natural microorganism that is a bacteria-microalgae hybrid. It performs both carbon capture and nitrogen fixation simultaneously - within one organism.

So: Ammonia production is known as: “ Nitrogen Fixation” (Connecting nitrogen from the air to hydrogen). It requires energy. We get the energy from the sun. The microalgae part of our microorganism is the “**solar farm of the 2μ protein factory**”.

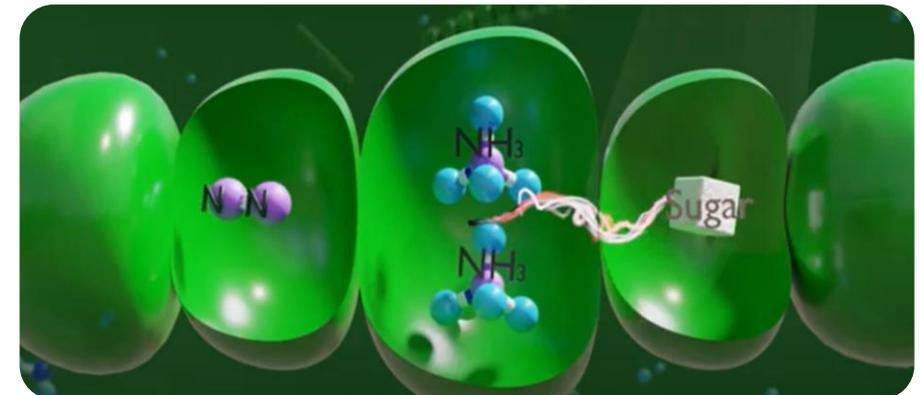
Ammonia is essential for the production of protein. Ammonia is the building block, the most important raw material in food production.

Vision

Revolutionize the production of high-quality alternative proteins, providing new natural raw materials and ingredients to the food industry, shaping a healthier, more sustainable future for generations to come.

Mission

Produce the highest quality protein for the best production costs without consuming the planet's resources: land, water and energy.



“Nitrogen Fixation”

Problem

We need more sustainable and cost-efficient solution to supply protein.

Animal slaughtering: Is not sustainable or economical

Growing carbohydrates (carbs) using chemical fertilizers for feeding animals
Is economically inefficient and is 27% of CO₂ emissions

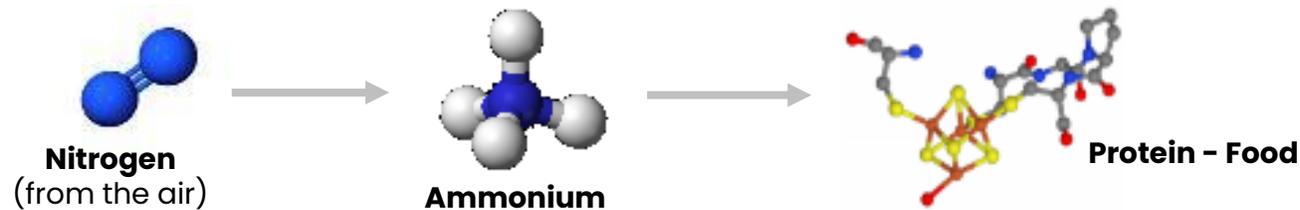
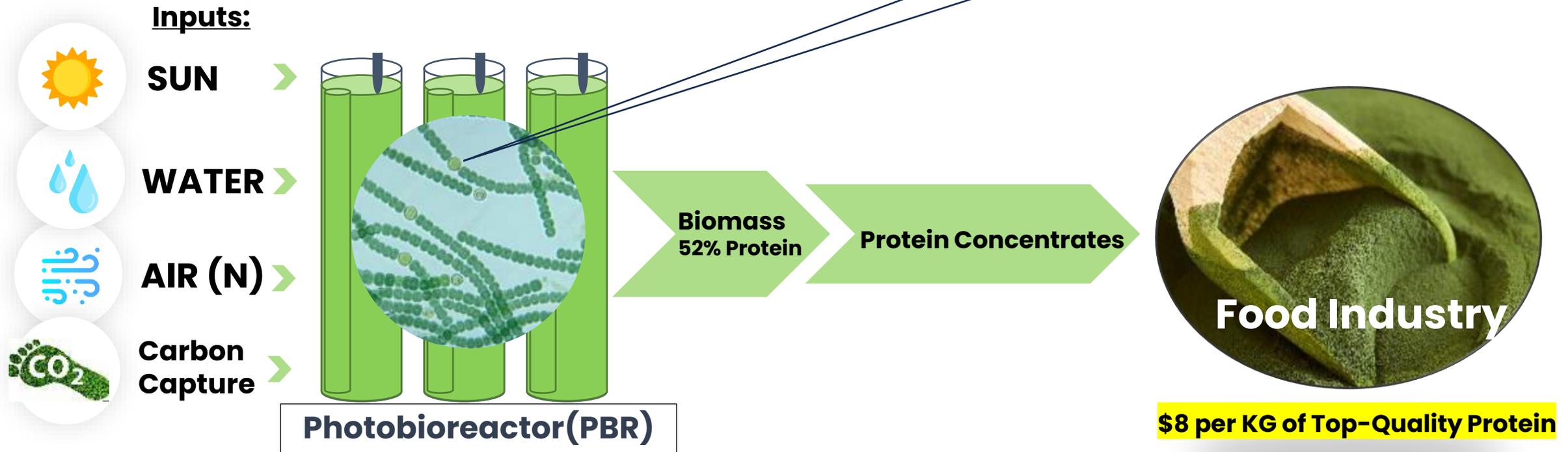


Solution: Use a bacteria-microalgae hybrid in a photobioreactor to make ammonia.



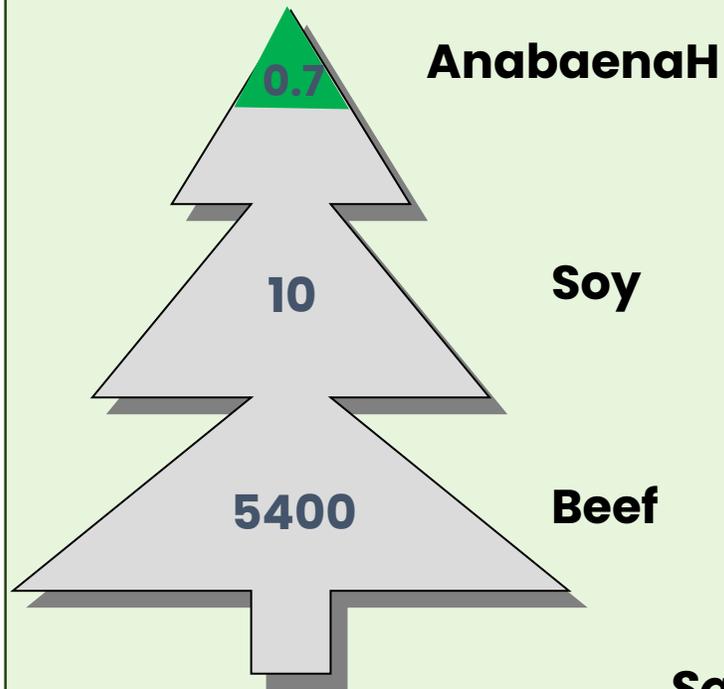
78% of the air is Nitrogen. Our **bacteria** "fixes nitrogen" and produces bio ammonia in its cells.

Our PBR is a solar factory that makes ammonia from the air **In a 2-micron cell**

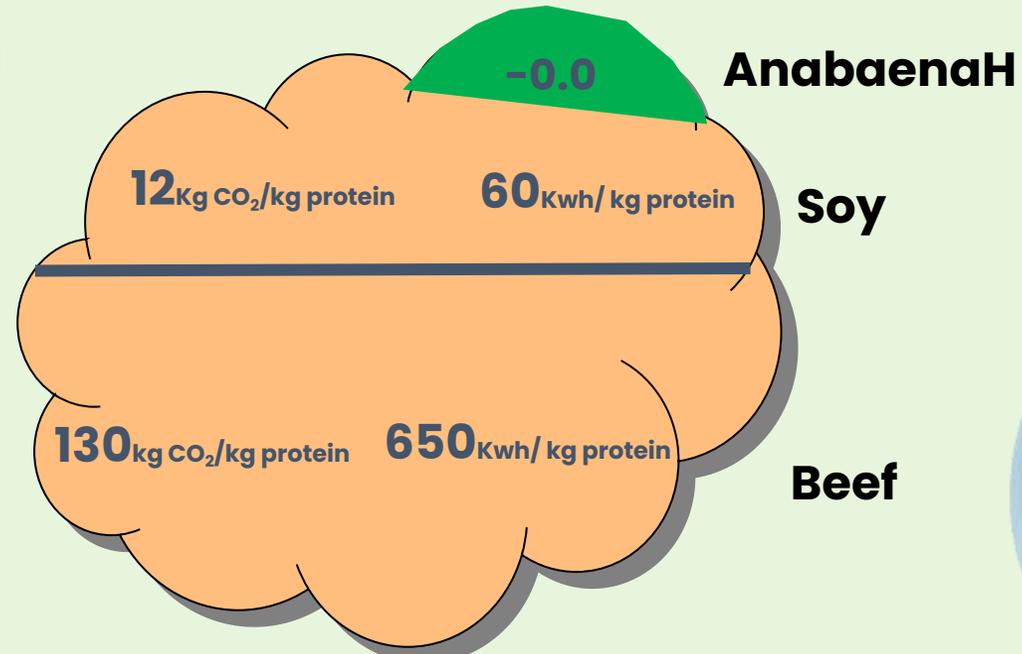


Our Planet's Future Depends On Microalgae for Efficient Use of Natural Resources.

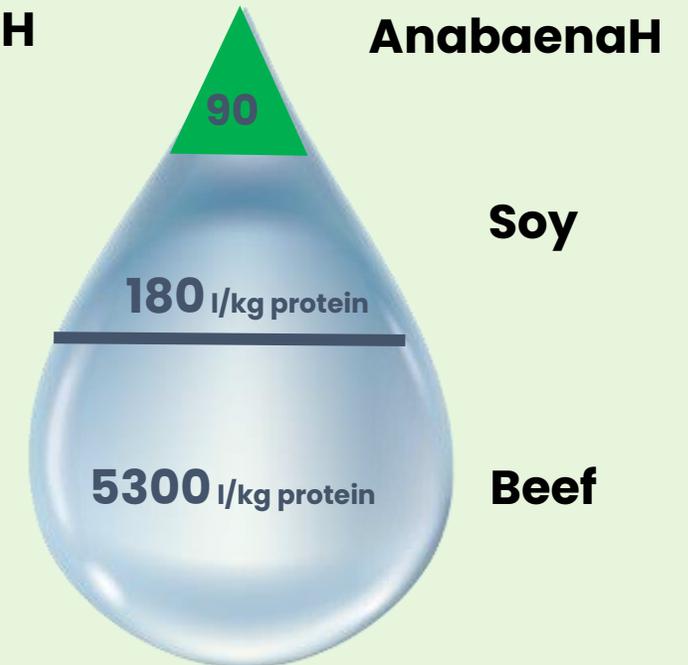
Land Use
(1000m² / Kg Protein)



CO₂ Emissions / Energy



Water Consumption
(Liter of water/kg protein)



Saving the Planet's Resources

Competing Protein Production Technologies



Cyanotech
Hawaii

Brevel
Israel

Euglena Co.
Japan

	algaenite	Cyanotech Hawaii	Brevel Israel	Euglena Co. Japan
Nitrogen Source	Organic NH₃	Chemical NH₃	Chemical NH₃	Chemical NH₃
CO2 Emissions	LOW	Medium	High	Medium
Energy	LOW	Medium	High	Medium
Cost of production	LOW	LOW	High	Medium
Cost of installation	LOW	LOW	High	Medium

Results

**Highest Quality Protein for the Lowest Production Cost:
Production cost: \$9 per KG (Selling Price: \$25)**

Automated remote-controlled PBR :



Business Model

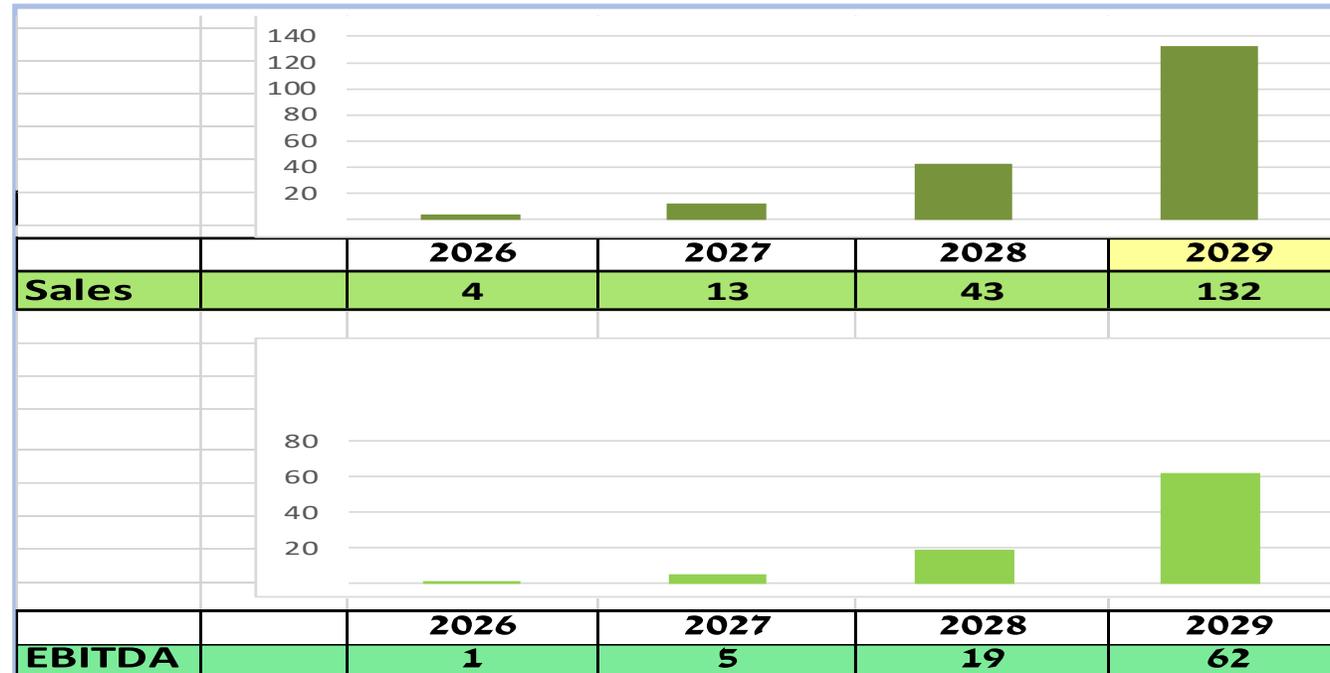
Build and Operate Protein Farms (BOT Business Model)

- B2B Sales of protein concentrates.
- B2B Sales of functional protein powders.
- Phase 2: Sales of protein consumer products B2B and B2C.

\$9 per Kg

Projection

Protein sales projections (In Millions of US\$)



USP - Differentiators

Highest quality protein for the lowest production cost: **\$9 per KG**

- Complete Protein
- Super Food
- Organic
- Net Zero Emissions



Protein Concentrates



Functional Protein

Yield from a 25,000 m2 PBR Farm:

(*) Biomass: 374 Tons of Biomass Annual Production (52% Protein 8.2% Nitrogen)

- Feed Stock for Biofertilizers Production
- Plant Based Protein (Bio) - Meat/Fish Analogs
- Food and Feed Additives
- Feed Stock for Bio Cosmetics Industry

- Transforming sustainable agriculture and protein production.
- Patents have been applied for the proprietary technology.

Join us in shaping the future of sustainability.

Thank You

More slides follow

[Algaenite Video S2](#)

www.Algaenite.com

Dec 2024

The PBR - Protein production system - Technology for future Protein farms

Next-generation farming

A columns system that enables the efficient growth of cell biomass, from which protein is subsequently extracted.

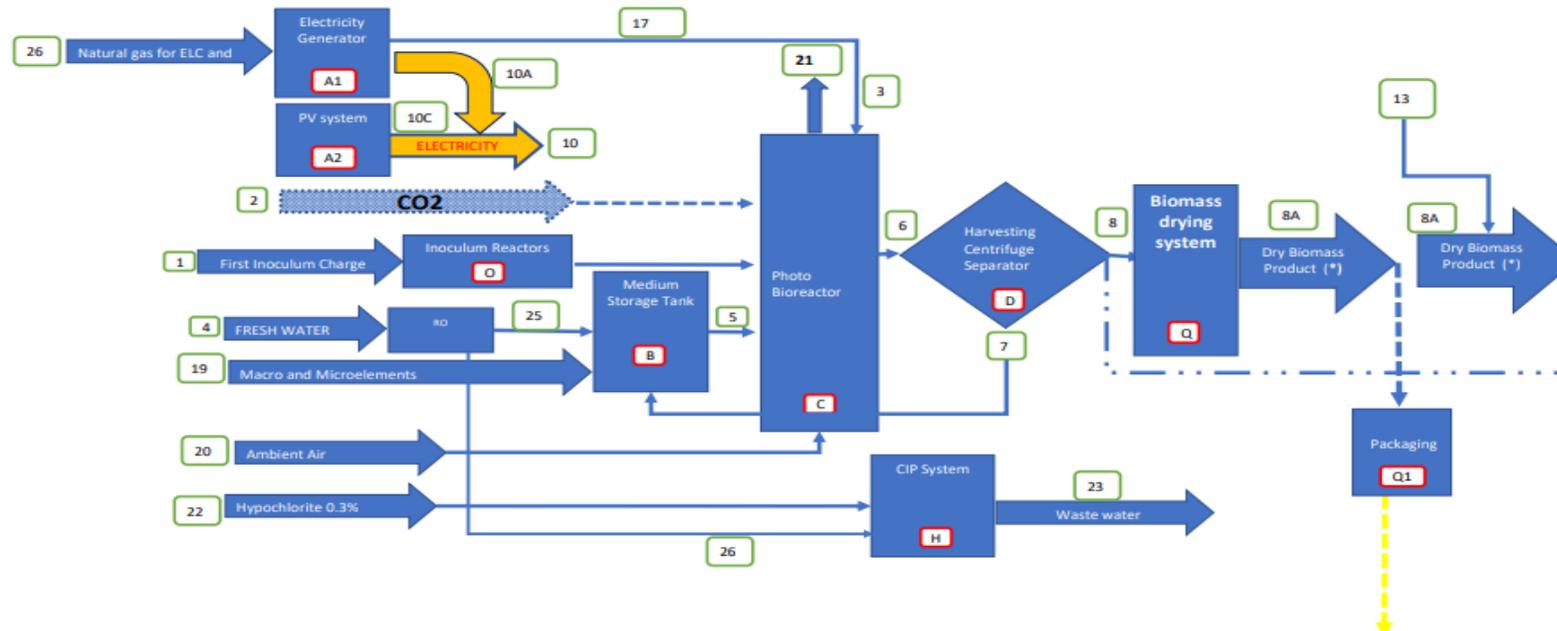
The columns are transparent to allow light to penetrate, for the benefit of the photosynthesis process carried out by the microalgae. At the bottom is the manifold, a system of pipes that hold the columns with a seal, which channels air enriched with carbon dioxide essential for algae growth. The airflow creates gas exchange and allows for the mixing of the biomass generated within the PBR.

To enable good control of the system (from a distance over the cloud), the PBR has a control and monitoring system that also optimizes the growth process. The development includes an algorithm for growing a culture called NightKeep™.



Our Process

Biomass Photo Bioreactor (BPB) Plant



(*) Biomass: 374 Tons of Biomass Annual Production (52% Protein 8.2% Nitrogen)
 - Feed Stock for Biofertilizers Production
 - Plant Based Protein (Bio) - Meat/Fish Analogs
 - Food and Feed Additives
 - Feed Stock for Bio Cosmetics Industry

Notes:

- (1) Location - Mishor Rotem Israel
- (2) Planned Foot Print 30,000m² (3Ha)
- (3) Water Consumption - 100,000 m³/y

Legend:

- (1) Process
- (2) Whole Plant at one location
- (3) Alternative Plant Setup: BPR at one location and BLF at different location
- (4) Products
- (5) Stream

75 Ton/Ha Of Protein

Footprint 25,000 m²



Our IP – Two Patent Applications where filed, in 2018 and in 2024



Provisional patents

62/724,457

August 2018

63/588,724

October 2023



PCT

IB2019/057284

Aug 2019

PCT

18/357,188

October 2024



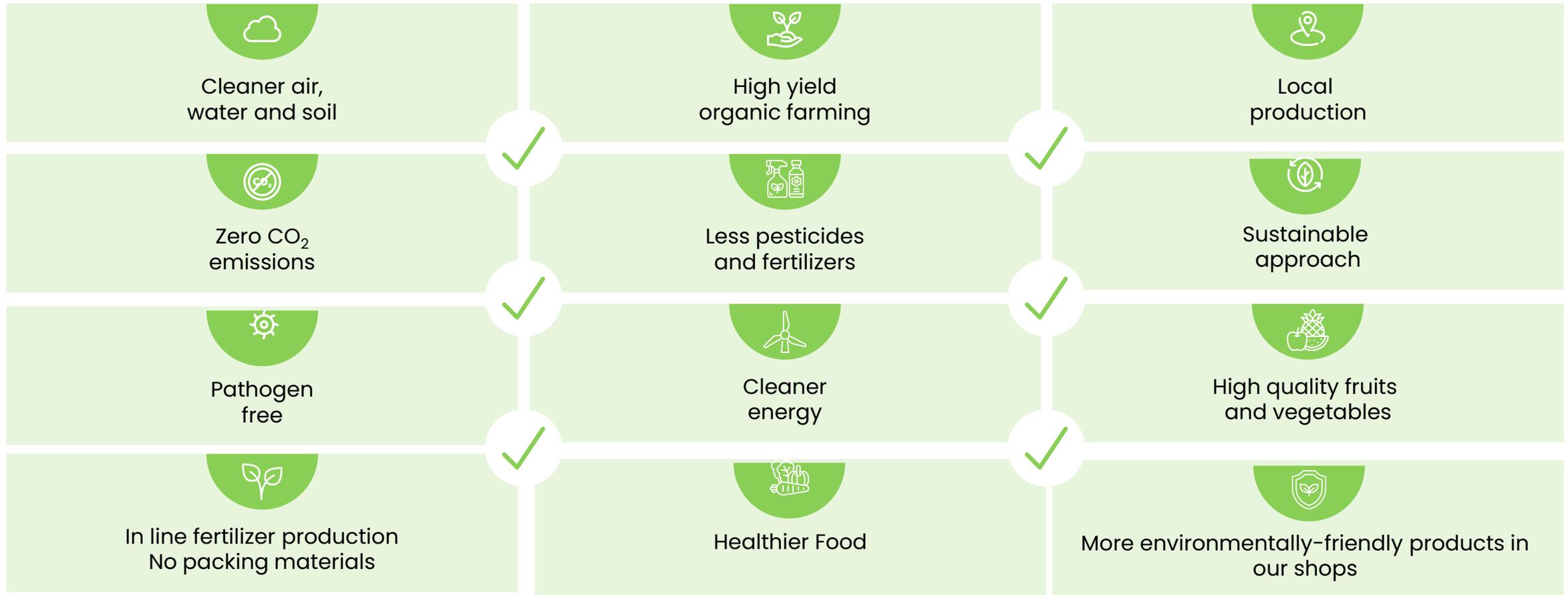
Applications
in **Europe**
and in the **US**



**Covering process engineering, algorithms, and machine learning
Over \$35,000 invested in IP protection (Leading Israeli IP Law Firm)**

Meets EU Green Deal Objectives

The European Green Deal will improve the well-being and health of citizens and future generations



Addressing 6 of the 17 United Nations Sustainable Development Goals:



Environmental Benefits

The system contributes to the quality of the environment since it is produced based on solar energy only, and the innovative development allows for 0 GHG emissions. The ISO 9001 certified

Produces Renewable Energy

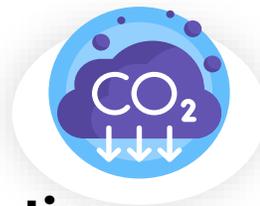
Methane is a by-product of the reactor and is used for generating 1/3 of the electricity needed to run the factory



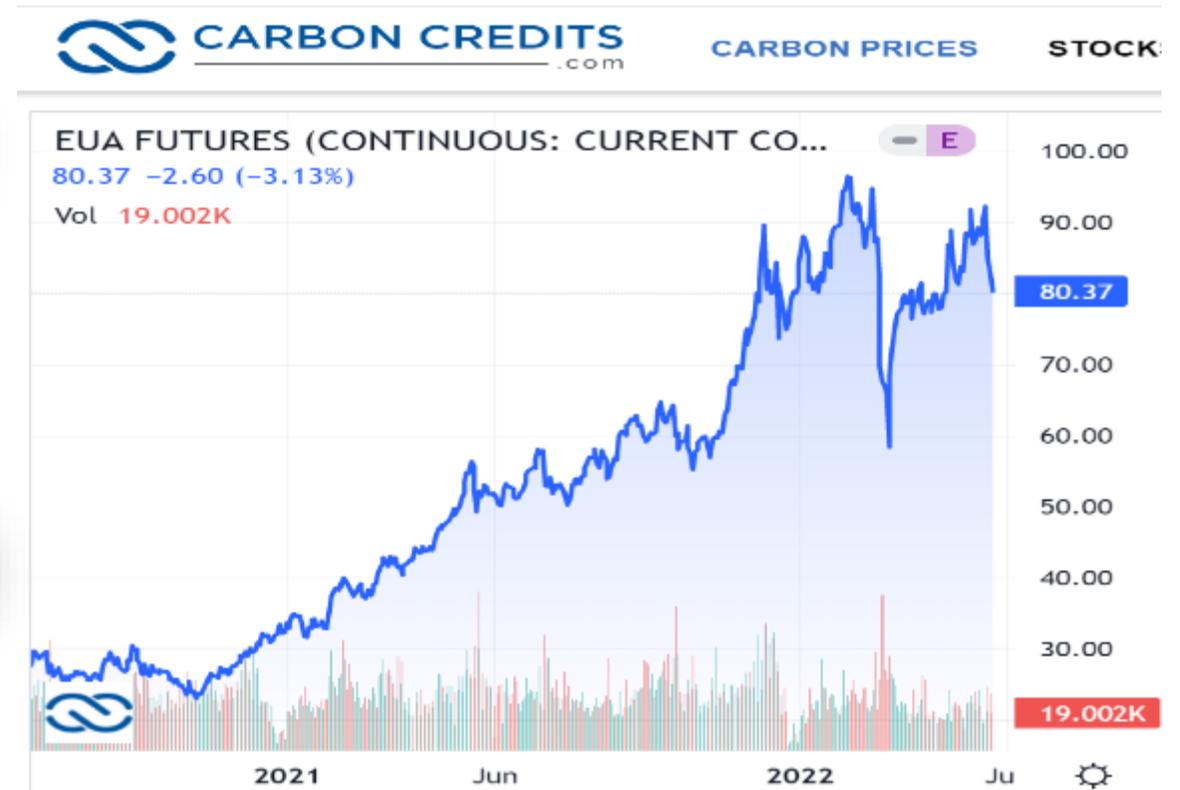
Negative CO2 Emission

**Carbon Dioxide Removal (CDR)
337 Tons per year per 3ha production unit**

Current price – €80.37 per Ton



1.5 tons of CO₂ absorbed per 1 ton of Biomass



Alternative Protein: Two Product Line

- 1. AnabaenaH - new natural stain developed**
Requires Regulation (Novel Food, GRAS)
Has not yet been approved for food
- 2. Spirulina BLF - Produced in the Algaenite PBR**
Fed by the Algaenite BLF
Marketing has started
Approved Food

AnabaenaH - Regulation (GRAS)

Target Date	GRAS Certification Milestones
4 weeks	Feasibility Assessment
4 – 8 weeks	Gap Analysis
6 -12 weeks	GRAS Dossier Preparation
12 – 48 weeks	FDA GRAS Submission
24 – 56 weeks	FDA GRAS Approval



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and Simplifying **Compliance**

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More products that we experimented with their development



An Energy drink with Blueberry flavor - Based on Natural Organic Ingredients



Blew Marshmallow with Phycocyanin



Blueberry Ice Cream with Phycocyanin

Cosmetics



Phycocyanin Face Mask
Antioxidant



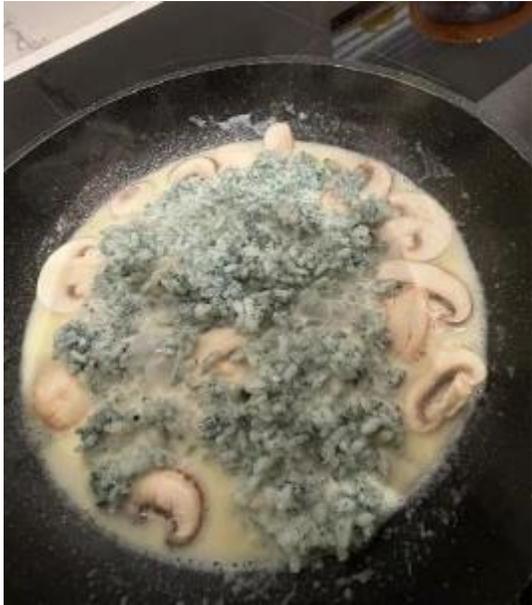
Phycocyanin Face Cream
Antioxidant

AnabaenaH / Spirulina BLF Beer

Prepared by Dr. Charles Harward



A small amount of freeze/thaw anabaena was added to the left glass of Heineken with no additive. also, anabaena after 6-7 cycles of freeze/thaw under microscope. the cells are sill distinguishable but virtually no chains of cells and beer appears transparent (dark but transparent)



Global Algae Protein Market (Alternative Protein)

52% of our AnabaenaH is protein

Protein Concentrates:



Allied Market Research

Global **ALGAE PROTEIN** Market

Opportunities and Forecast, 2021-2028

Global Algae protein Market is expected to reach **\$709.0 Million** by 2028.

Growing at a **CAGR of 8.9%** (2021-2028)

<https://www.alliedmarketresearch.com/algae-protein-market-A12704>

The Global Phycocyanin Market (Functional Protein)



50% of Our Anabaena H protein is Phycocyanin

In 2022
757.4 M\$

CAGR 7%
2023-2033

Expected to
reach
1,488 M\$
by 2033

<https://www.futuremarketinsights.com/reports/phycocyanin-market>



Lior Hessel 

Founder

Entrepreneur with vast know-how and experience in Ag-Tech. Founder and CEO of Growponics



Liat Hessel 

CRO

Food scientist with over 15 years of experience in alternative portion R&D. Adv, Food Law Consultant.



Dr. Hani Shkolnikov Lozober 

Biotechnologist

Ph.D. on Cyanobacteria protein at the Faculty of Biotechnology and Food Engineering, Technion, under [Prof. Avi Shpigelman](#)



Dr Yuri Belilovsky 

CTO

35 years engineering experience
Energy and thermodynamics expert



Anders Thomsen 

CEO Algaenite ApS Denmark

Marketing



Professor Yoram Gerchman 

Research and development

Full Professor at Oranim Academic College. Researcher at the University of Haifa. Vast experience in biotechnology including nitrogen-fixing cyanobacteria and biochemistry.



Tal Amsalem 

CEO

An experienced food industry executive. Vast knowledge in food-Tech marketing



Kobi Cohen 

CFO

25 years experience in global innovation financial management



Ohad Hessel 

COO

25 years of engineering experience.

Marketing and project management



Dr Stefan Leu 

Biotechnologist

Experienced Biochemist, Environmental Scientist and Sustainability Expert



Assaf Shemesh 

Biotechnology Engineer / Software Developer



Anders Thomsen
CEO Algaenite ApS Denmark

Former Director of the Danish Institute of Innovation. Massive experience in the commercialization of technologies and transfer from academia to industry

About Us:

Algaenite Protein is a new company established as a spinoff of Algaenite.com

Algaenite is a Delaware cooperation, a spinoff of Growponics



→ Over 30 Hydroponic projects

→ Over €40,000,000 investments

→ Over €12,000,000 in R&D



**Winners of the EU Seal of Excellence 2022
For the Algaenite™ technology**



Technology funded by the EU Horizon 2020

Algaenite Video S2