SOPHIE'S BIONUTRIENTS

Sustainable Microalgae Protein

The microgravity effect on heterotrophic growth of microalgae for food and nutrition

Eugene Wang
Co-Founder & CEO

Problem with surging demand for protein

PROTEIN SOURCES

Animal-based proteins:

NOT Sustainable!

Plant-based protein

Limited nutritional value

Allergens like gluten and soy

Emerging market: Protein from microorganisms (including microalgae)

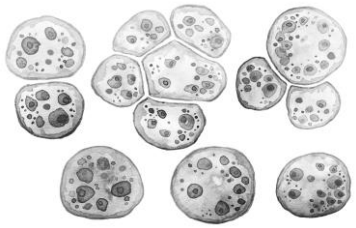
Good nutritional value

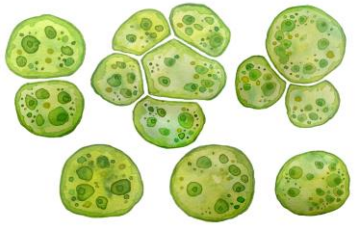
Need functional proprieties

Need neutral colour and odour

We have developed a patented cutting-edge process to create an optimal protein flour

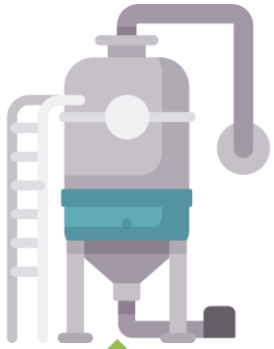
Strain Selection Process
Trade Secrets





Chlorella vulgaris

Protein Induction Process
Patented or Patent Pending



Pioneers using Industrial Food Waste

spent grains, okara and molasses

Protein Isolation Process
Trade Secrets + Patent Pending

- **High protein content (60%)**
- **High nutritional value (Vitamins, Iron)**
- **Competitive Price (€6/kg)**
- **Natural claim**
- **Circular Economy**

Production using food waste

Why Food Waste?

Reduced Cost

Circular Economy

Spent grains
Wastes from breweries

Okara
Wastes from tofu makers

Molasses
Wastes from sugar refinaries

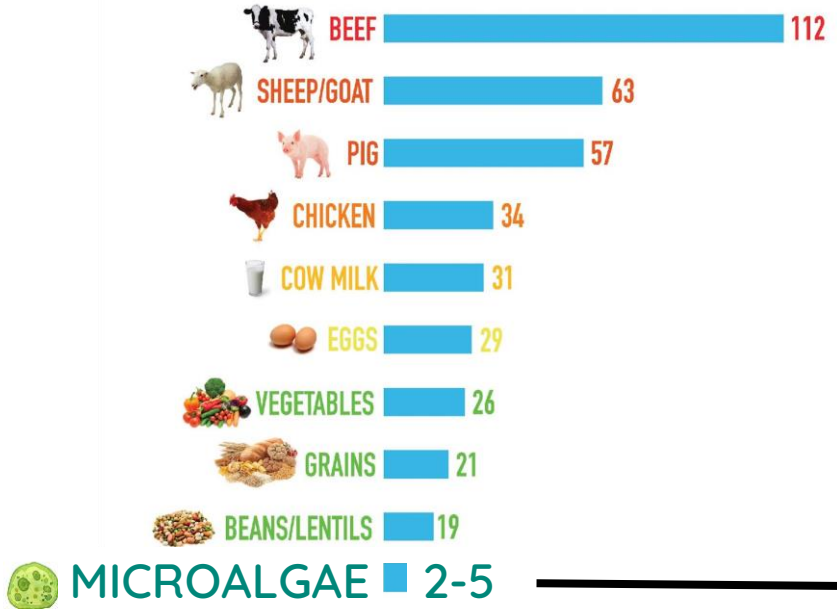
Rice bran & Sake Lee
Wastes from rice processors

Ugly dates
Wastes from farms

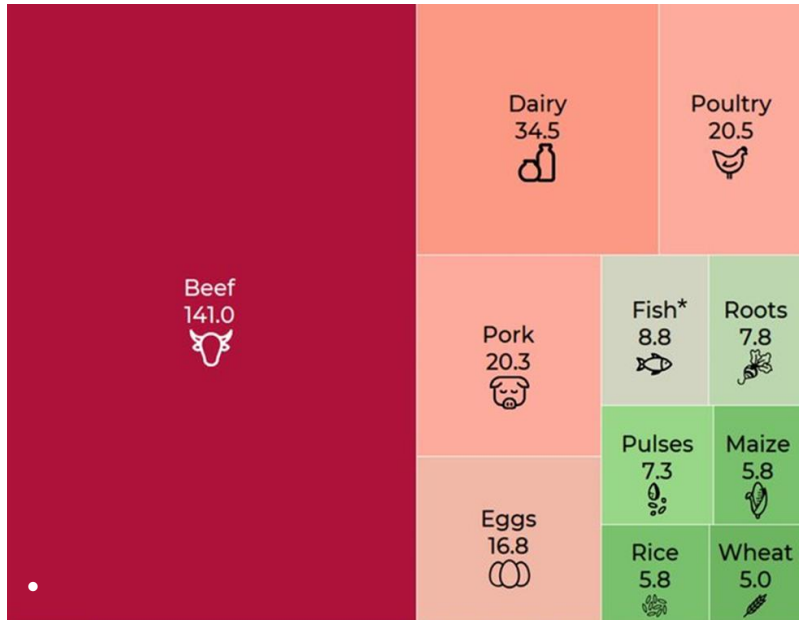
Orange peels
Wastes from juice manufacturers

Our impact: saving water, land, and 7 SDGs

We ONLY require 2-5 L of water per gram and 0.02 hectares to produce same amount of SBN protein



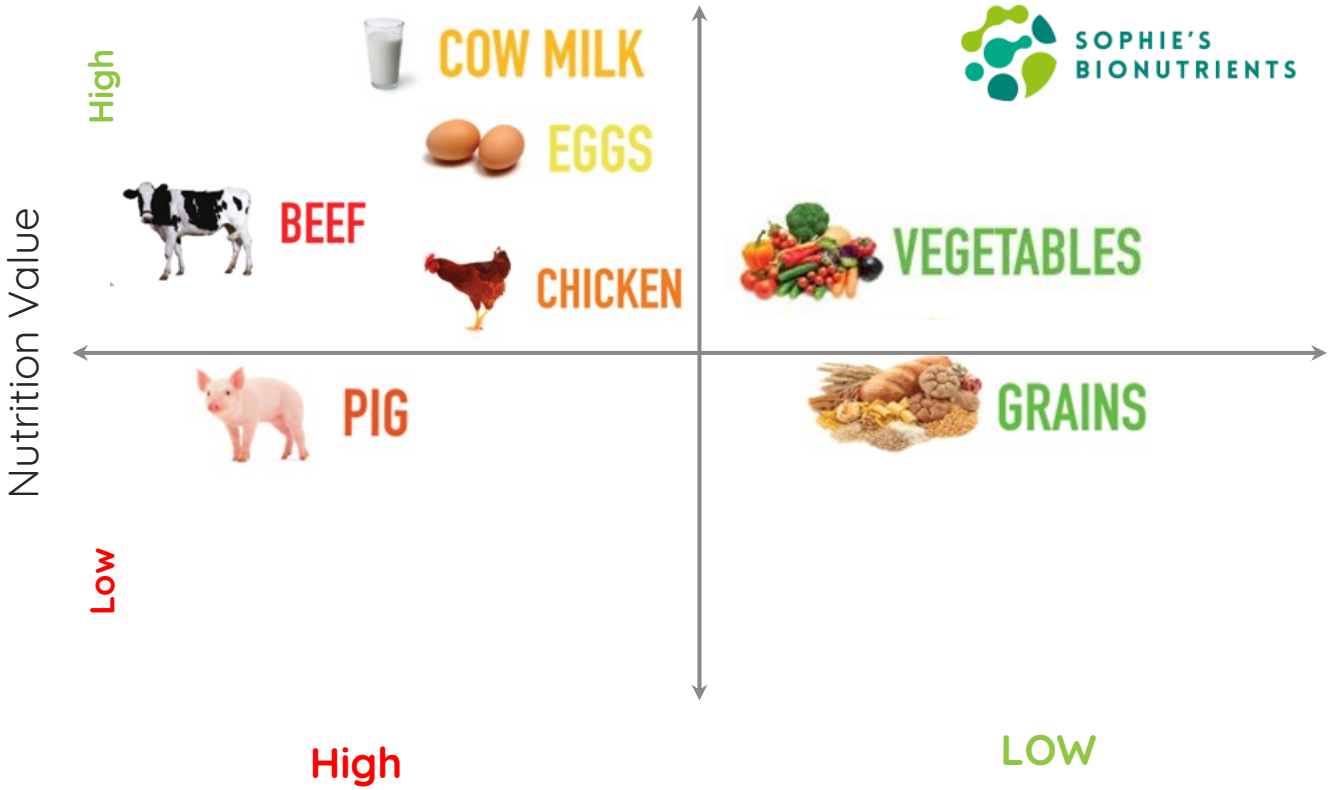
Liters of water per gram of protein.



Hectares of land needed to produce 1-ton protein.

Better Nutrition Less Footprint

Competitive Landscape



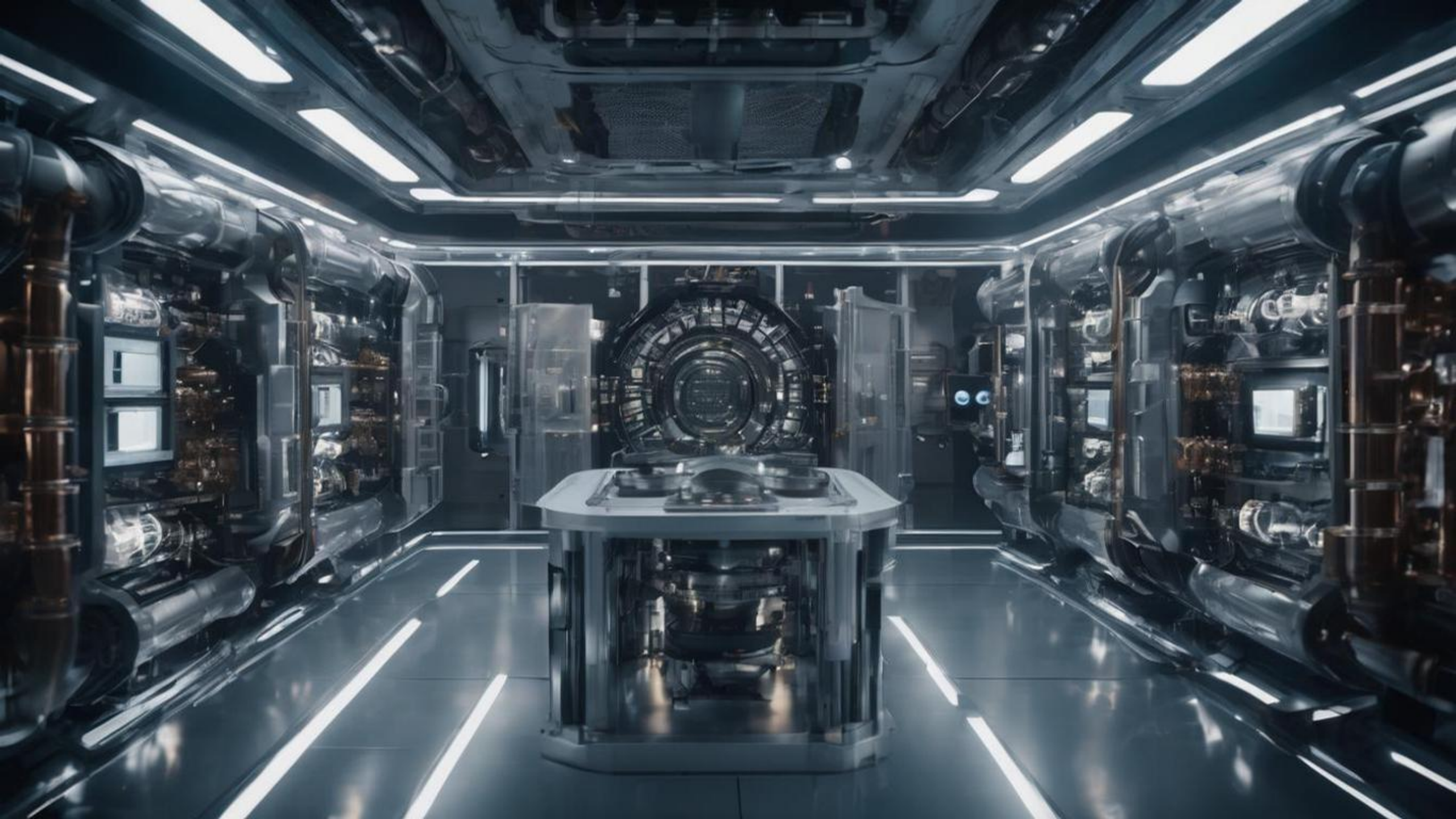
Our unique value proposition:

- **Better Nutrition** and **functional properties** (means less cost and better texture)
- **No Known Allergens**
- **No off taste** and better Consumer Perceptions
- **Regulatory Ready** (EFSA Approved, GRAS Ready)
- Our flour is an **isolated protein, not a biomass**, thus it **facilitates & reduce cost** of Plant meat and Plant dairy industries transformation process into food and meal

SOPHIE'S BIONUTRIENTS

The BEST way to develop the MOST sustainable food technologies on Earth is

to go to SPACE or even Mars



BSGN provides us the FIRST point of entry

Through BSGN …

We are now able to work with different service providers to take our project to ISS

YURI

BIOREACTOR EXPRESS

How we will do it

We plan to conduct the microalgae fermentation processes at two locations

1. International Space Station
2. AlgaeParc (Wageningen University, Netherlands)

The one done at AlgaePARC will serve as CONTROL. We will simulate microgravity condition on Earth and running on parallel through the use of a (3D) clinostat or RPM.

The strains we will study are

Wild Type *Chlorella vulgaris*

Sophie's BioNutrients' Proprietary Pale Type *Chlorella vulgaris*

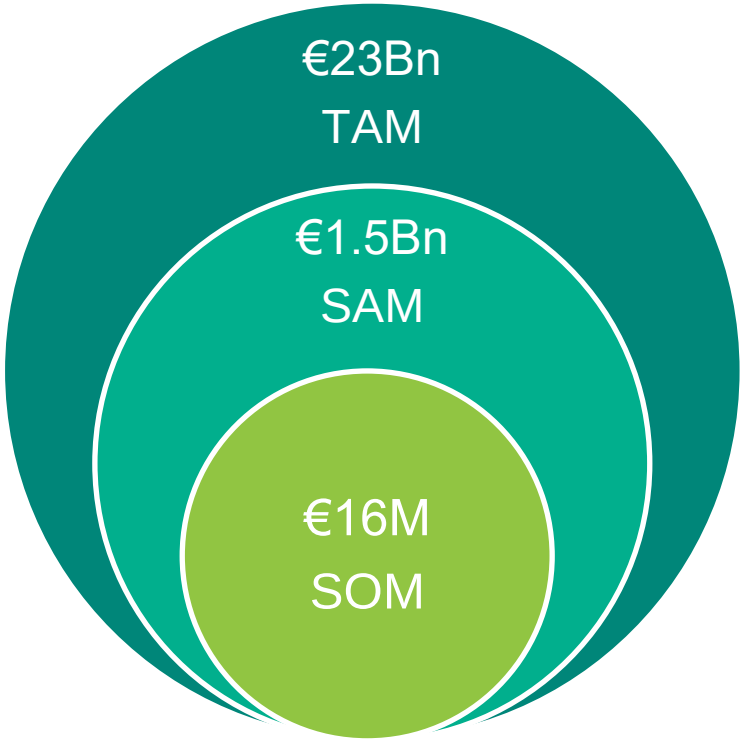
What we plan to understand to reduce cost

We use the microgravity research conducted on ISS to understand how the Earth's gravity is affecting the following,

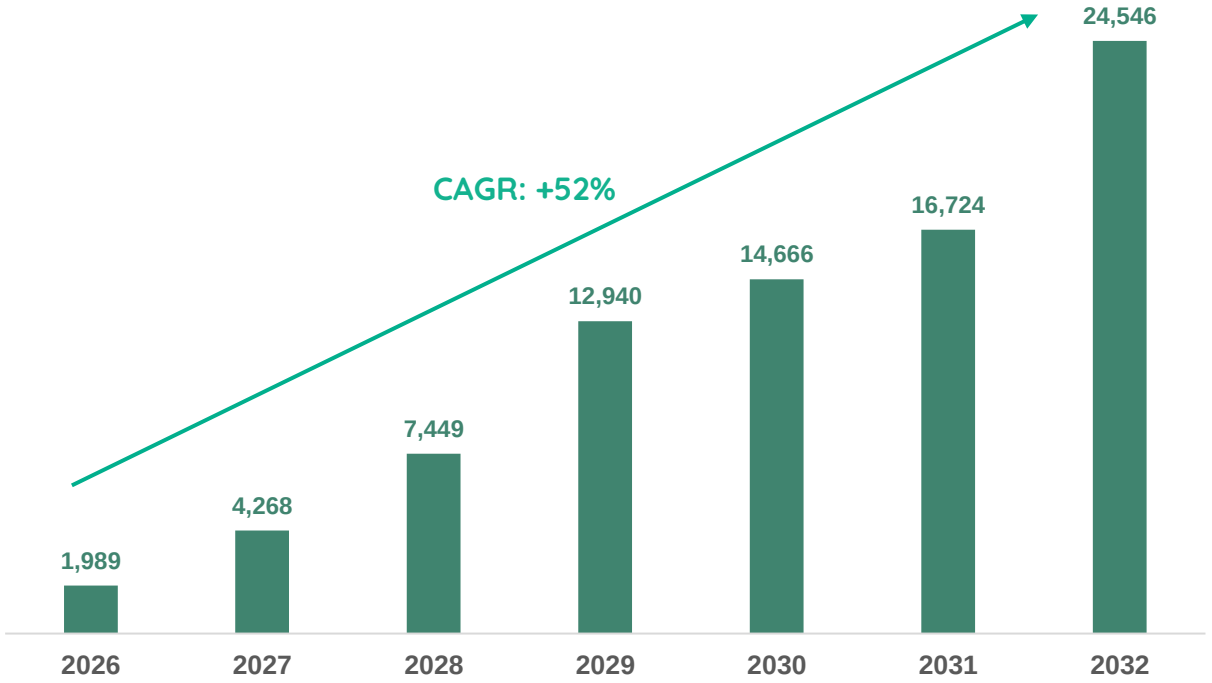
1. The heterotrophic growth rate
2. The nutrition composition
3. The rigidity of cell wall & organelles change (e.g. Chloroplast)
4. The oxygen input and CO2 output of the heterotrophic cultivation
5. The amino acid content of the studied strains

We aim at a Huge & Fast-Growing Market by 2035

Current Market Size



SBN Flour Revenues Projections (in k€)



SOM means penetrating approx. 0.1 % (estimated) of the EU alternative protein market by accessing DE, FR, NL, DK, BE, ES, PT by 2035.

Cost Projections

		€K
1	**Expenditure on Manpower (In-kind)**	
	Sophie's BioNutrients	36,000.00
	EOM Total	**36,000.00**
2	**Equipment**	
	AlgaePARC	7,000.00
	Equipment Total	**7,000.00**
3	**Other DIRECT COSTS**	
	Sophie's BioNutrients	5,000.00
	AlgaePARC	15,000.00
	Other Direct Costs Total	**20,000.00**
	Total Direct Cost (excl EOM)	**27,000.00**
4	**Indirect Costs**	
	Sophie's BioNutrients	5,000.00
	AlgaePARC	5,000.00
	Indirect Cost Total	**10,000.00**
5	**Service Provider Cost (Please see file attached)**	252,500.00
6	**Unexpected Cost (Like equipment or else)**	10,000.00
	TOTAL FUND REQUESTED	**299,500.00**

Cost of Risk Mitigation is LOW

Risk	Impact	Likelihood of Occurence	Severity of Consequences	Risk Magnitude	Precaution Measures	Mitigation Plan	Cost of Risk Mitigation
Budget Overrun	Cost	Medium	Medium	Low	Constant Budget Reviews	Finding Alternative Funding	Low
Pre-Flight Project Delay	Schedule	Medium	High	High	Periodic Meetings	Postpone to Next Flight	Low
Pre-Flight Contamination	Technical	Medium	High	High	Attention to The Purity of Culture and Medium	Work with Service Provider	Medium
In-Flight Tempreture Changes	Technical	Medium	High	Medium	Tempreture Monitoring	Work with Service Provider	Low
In-Flight Payload Malfunction	Technical	Medium	High	High	Multiple Pre-Flight Testings	Work with Service Provider	Low

Our team

Eugene Wang
Co-founder & CEO

20+ years in food manufacturing

Successfully exited Sophie's Kitchen Plant-Based Seafood

MBA from Columbia Business School

Marieke Vanthoor
CTO

Algae production expert and food process technologist

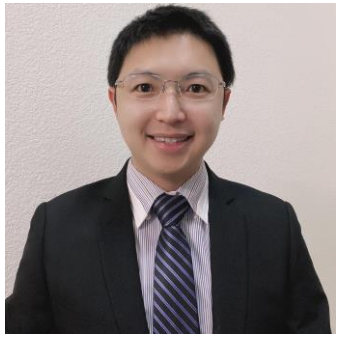
PhD growth of sponges (WUR)
MSc Bioprocess Engineer (WUR + Avans Breda)

Kirin Tsuei
Co-founder & CCO

20+ years in global supplement companies

MS in Nutrition Science from UC Davis

Licensed Dietitian



Chen-Han Shih
CSO

10+ years in microalgae research

PhD in Biosystems Engineering from The University of Arizona

SOPHIE'S BIONUTRIENTS

Our Partners

R&D Partners

ACIES BIO

3V TECH
PROGRESS BY PROCESS

BSGN
Business in Space Growth Network

DANISH TECHNOLOGICAL INSTITUTE

TERRA BIO

AlgaePARC™
is part of WAGENINGEN UR
For quality of life

Commercial Partners

Hochland

Ingredion

driessen group of companies

Vitagora®

DENISGROUP
ESTABLISHED 1862

Microalgae will be part of the Future Space Food systems

SOPHIE'S BIONUTRIENTS

Our Mission

Decoupling protein supply from arable land
& reducing the environmental footprint

Let's make EU a sustainable protein powerhouse!!!

Eugene Y. Wang
Co-Founder & CEO

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eugene@sophiesbionutrients.com

Our Vision

To make microalgae protein available even on Mars

Eugene Wang
Co-Founder & CEO at Sophie's BioNutrients