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Fueling the protein transition

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Nothing is lost,
Nothing is created,
Everything is **transformed**.
A. Lavoisier

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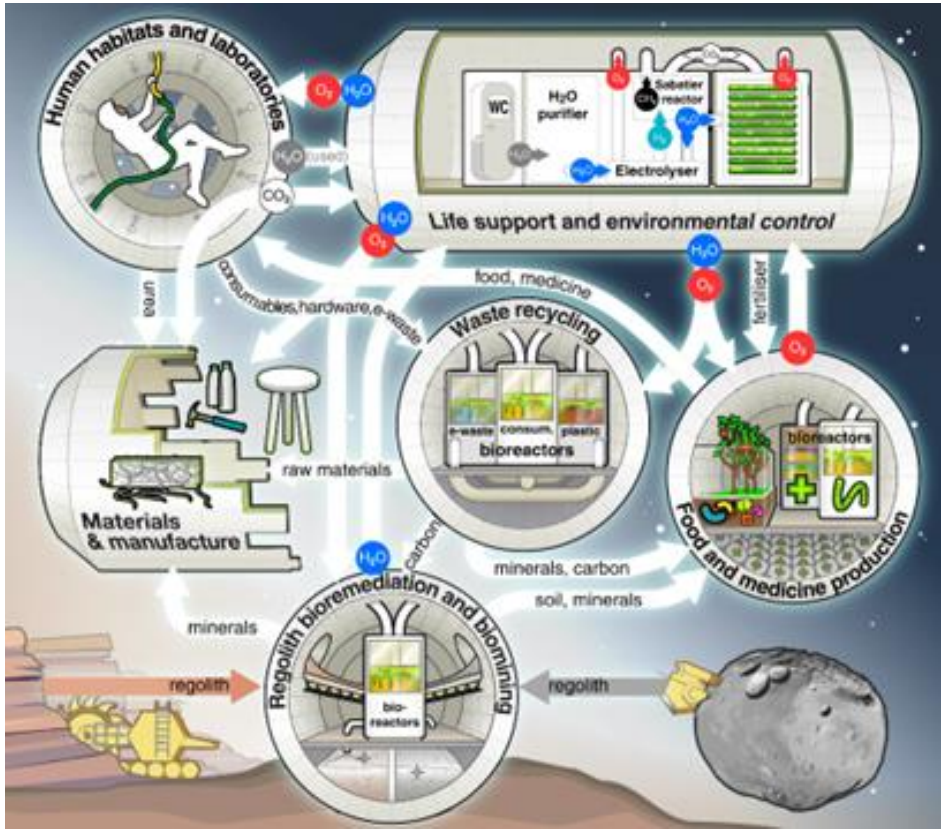


Source: Graphical rendering of a microbial biotechnology-based life-support system in an agnostic space environment. Retrieved from Santomartino, R., Averesch, N.J.H., Bhuiyan, M. et al. Toward sustainable space exploration: a roadmap for harnessing the power of microorganisms. Nat Commun 14, 1391 (2023). https://doi.org/10.1038/s41467-023-37070-2

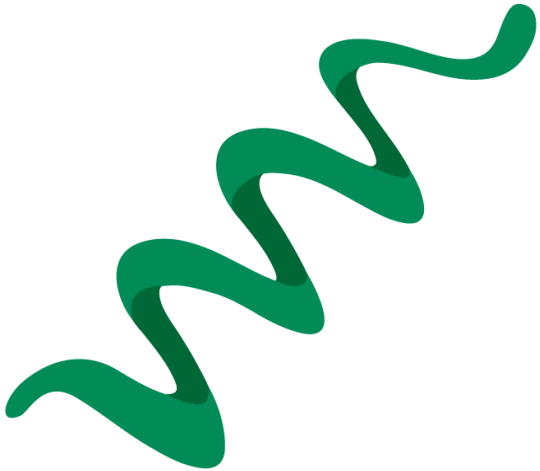
Challenges on earth and beyond

On earth

- Nutrient deficiencies
- High environmental burden of protein production
- Animal welfare

In space

- Nutritional requirements on longer missions
- Launch weight efficiency & limited volume
- CO2 & Nitrogen cycle to keep the astronauts alive!



- **Nutrient dense + easily digestible**
- **Incredibly low environmental burden**
- **Closing the loop on earth and beyond**

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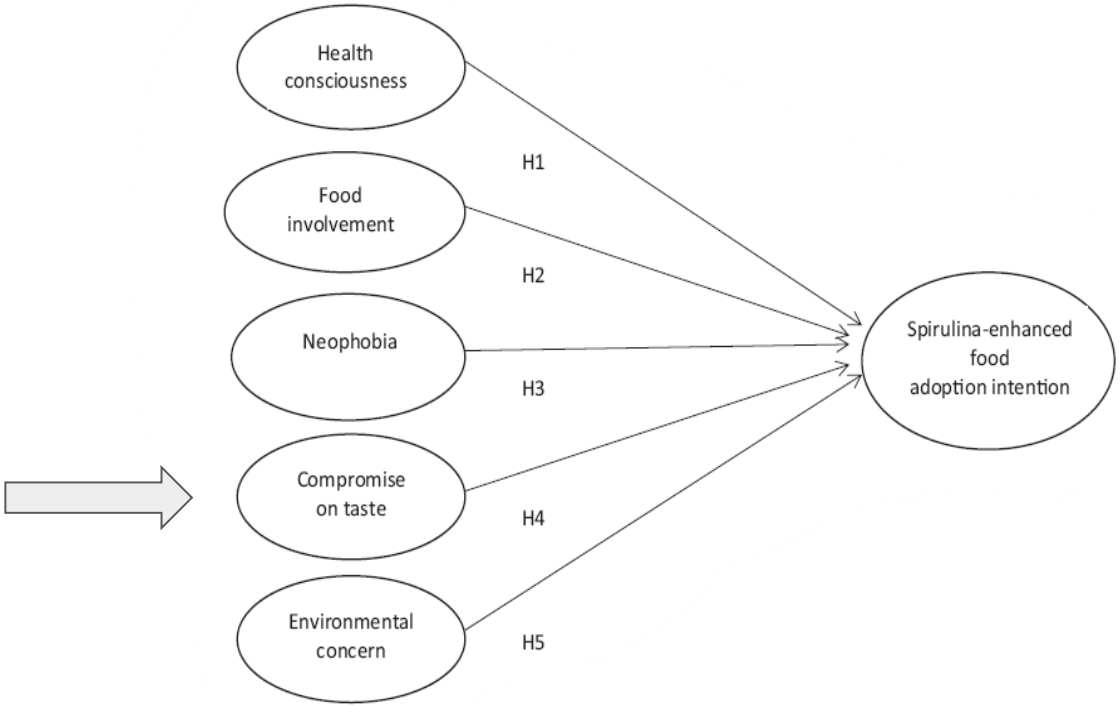
Spirulina bioreactors have previously been successfully researched on the ISS

Earth-bound bioreactors

- State of the art bioreactors
- High quality biomass => FRESH
- Tasteless and very nutritive

- Complex (industrial) food technology
- Very little literature and prior research to rely on
- High tech production method



Source: Moons et al.

Rode Kruis Ziekenhuis
Medisch Specialistische Zorg

Hôpital Erasme | ULB

WAGENINGEN
UNIVERSITY & RESEARCH

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Astrofood makes its neutral tasting fresh biomass the main ingredient in developing high-performance nutrition.

Our research is driven by our close ties with many **universities**, **laboratories** and **health professionals** in the benelux. This allows us to deliver optimized nutrition for high-performances.

GHENT UNIVERSITY

KU LEUVEN

LIÈGE université

SMART GASTRONOMY LAB

- Powerful product
- Generates biomass demand
- Continuing academic research

=> SYMBOL OF A NEW WORLD

Rob
THE GOURMETS' MARKET

EURO SPACE CENTER

Team

Zakaria Grevisse, DVM
CEO & Chief Scientist

Dirk Decoster
Businessman
Former CEO Agristo, Fevia
Advisor

Prof. dr. ir. Willy Verstraete
Former chair environmental sciences & food production, cofounder MELiSSA
Advisor

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Next step: solid foodstuffs

Food technology?

The case for biotech on Mars

The stepwise application of biotechnology will be instrumental to addressing four key challenges of Martian settlement.

Shannon N. Nangle, Mikhail Y. Wolfson, Lucas Hartsough, Natalie J. Ma, Christopher E. Mason, Massimo Merighi, Vinitra Nathan, Pamela A. Silver, Mark Simon, Jacob Swett, David B. Thompson and Marika Ziesack

Food production. Food production is one of the most immediate uses of biotechnology on Mars[32,33]. Approximately five tons of food are required to sustain a crew of six on 3,000 calories per day for an ~500-day surface mission, with an additional eight to ten tons for transit and contingencies.

3D Food Printing

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Conclusion

- Quality Benchmark
- AI Food Tech Database
- Groundwork for long-duration space travel & the future of life on Earth?