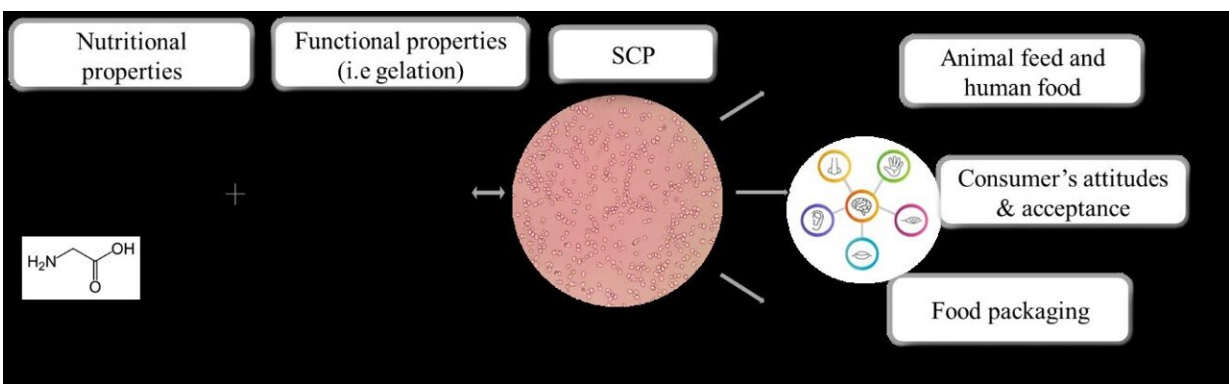


Single cell protein: An alternative eco-friendly protein source derived from microorganisms

September 18 2023



Properties and application of SCP. Credit: Danai Ioanna Koukoumaki

Researchers and businesses are increasingly drawn to alternative protein sources as they grapple with the challenge of meeting the growing global demand for protein. Among the unconventional sources, microorganisms stand out for their remarkable protein content.

Dry microorganism cells have been described as "single cell [protein](#)" (SCP) or "microbial protein." SCP is primarily sourced from [microorganisms](#) such as yeasts, fungi, bacteria and algae. They serve as an environmentally friendly alternative to animal-derived proteins. Furthermore, microorganisms exhibit the capacity to thrive on a diverse

range of substrates for their growth, including [waste materials](#).

Leveraging [renewable resources](#) derived from different waste streams within the food and [agricultural sector](#), such as dairy waste, crop residues, sugar industry byproducts, and fruit waste, has the potential to greatly enhance SCP production from a standpoint of socio-economic and environmental sustainability.

"Particularly when SCP production is integrated into biorefinery frameworks, it can significantly advance circular bio-economy concepts, fostering the continued growth of the SCP market for applications in [animal feed](#), innovative food formulations, and bioactive food packaging," explains Danai Ioanna Koukoumaki, first author of a recent review on the topic published in *Carbon Resources Conversion*.

"It's true that the use of microorganisms for protein production holds promise, but it is nonetheless crucial to study consumer perceptions of this alternative protein source," adds Koukoumaki, who is a Ph.D. candidate at the Department of Food Science and Nutrition, University of the Aegean.

For instance, in a research study examining the attitudes of older adults towards alternative protein sources such as single-cell protein and plant-based protein, it was observed that gender and country of residence had a notable impact on acceptance levels.

Overall, the review provides a clear insight of the micro-organisms, agro-industrial wastes, functional properties, as well as current applications of single-cell protein.

"Utilizing renewable feedstock in SCP production has the potential to address both modern society's challenges of food waste management and protein shortages. However, to effectively commercialize this

alternative, efforts must be made to enhance consumer acceptance," concludes corresponding author Dimitris Sarris.

More information: Danai Ioanna Koukoumaki et al, Recent advances in the production of single cell protein from renewable resources and applications, *Carbon Resources Conversion* (2023). [DOI: 10.1016/j.crcon.2023.07.004](https://doi.org/10.1016/j.crcon.2023.07.004)

Provided by KeAi Communications Co.

Citation: Single cell protein: An alternative eco-friendly protein source derived from microorganisms (2023, September 18) retrieved 6 May 2024 from <https://phys.org/news/2023-09-cell-protein-alternative-eco-friendly-source.html>

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