

Sustainable Protein Recovery from Soft Capsule Trimmings Using Green Extraction Methods. GREENCAPSU

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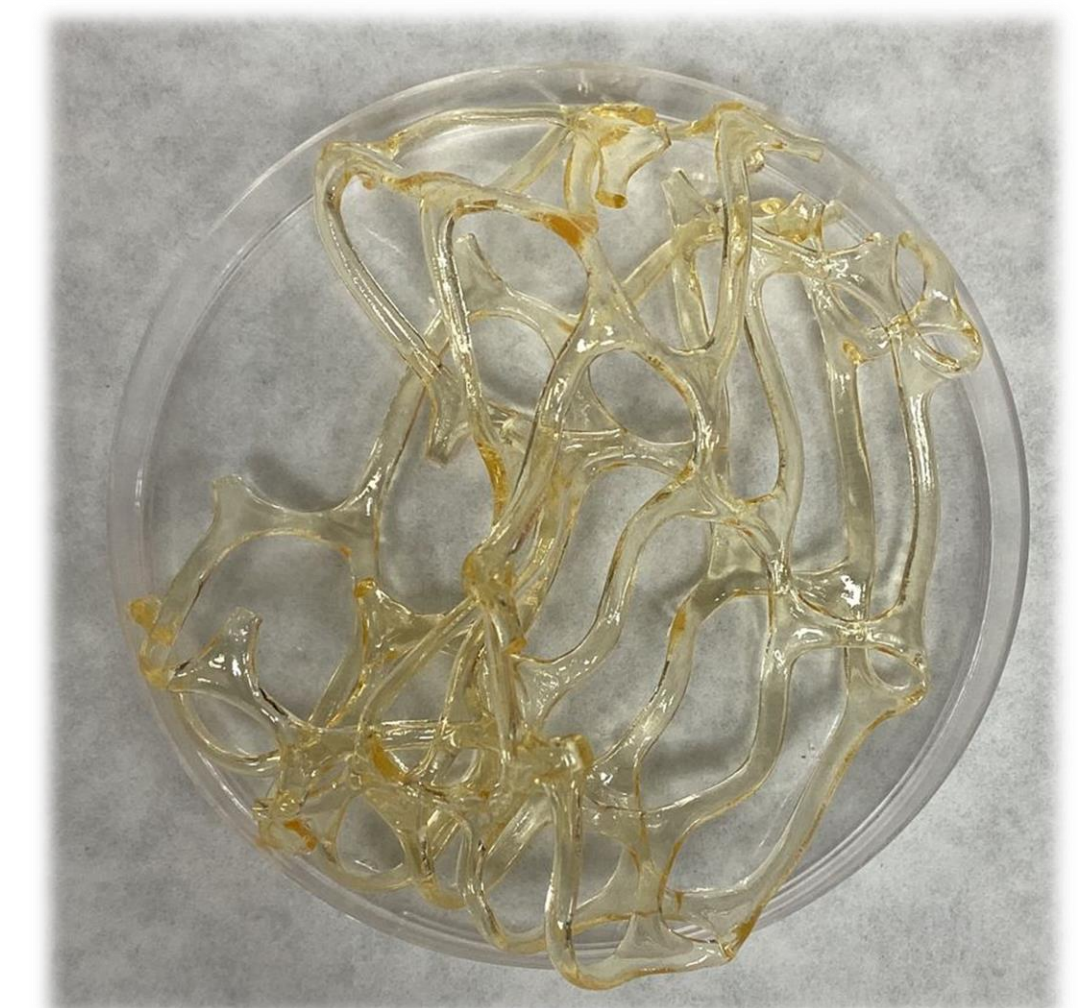
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INTRODUCTION

The food supplement industry generates significant amounts of waste during the encapsulation process of powdered and liquid formulations in soft capsules. These trimmings, mainly composed of gelatin and other valuable biomaterials, represent an untapped resource with potential applications in food production. This project aims to revalue this industrial by-product through sustainable extraction methods, promoting circular economy principles in food technology.



Picture 1. Soft capsules trimmings

OBJECTIVE AND RESULTS

This GREENCAPSU project aimed To develop an environmentally friendly approach for the recovery of protein from soft capsule trimmings by applying green extraction technologies, eliminating the use of organic solvents, and transforming waste into a functional food ingredient.

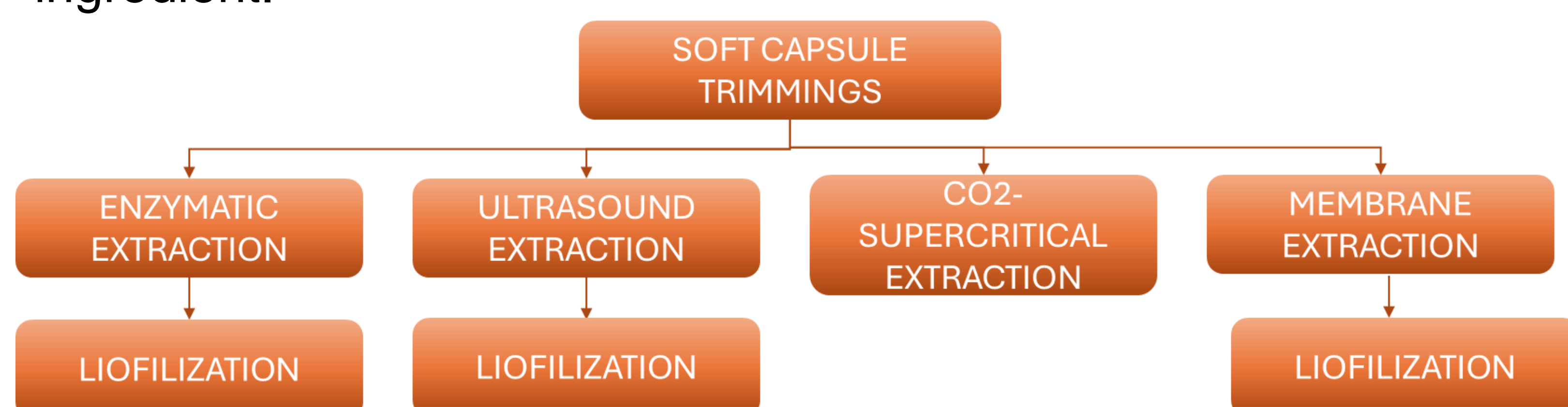
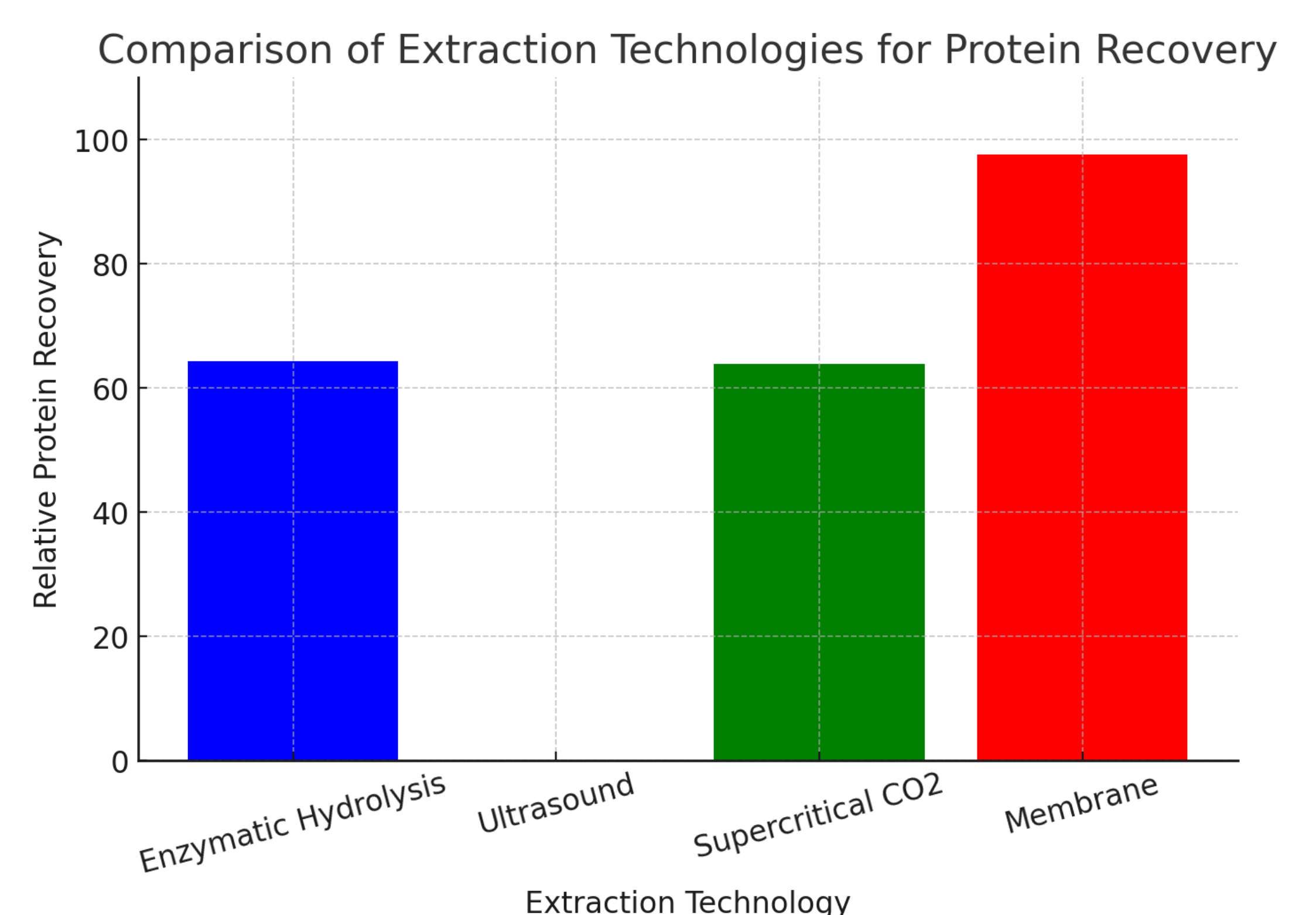


Figure 1. Methodology for protein recovery from soft capsules trimmings



RESULTS & CONCLUSIONS

- ✓ Membrane extraction achieved the highest protein recovery (97.6 g/100 g), proving to be the most efficient method for obtaining a high-purity protein fraction.
- ✓ Enzymatic hydrolysis (64.3 g/100 g) and supercritical CO₂ extraction (63.9 g/100 g) also showed promising results, offering viable solvent-free alternatives for protein recovery.
- ✓ Ultrasound technology did not yield any significant protein recovery, suggesting that this method alone is not suitable for extracting proteins from soft capsule trimmings.
- ✓ The use of green extraction techniques eliminates organic solvents, aligning with sustainability principles and ensuring the production of a clean-label, functional protein ingredient.

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