Ultrasound-Assisted Salt Extraction of Functional Proteins from Oilseed Press Cakes for Sustainable Food Ingredient Development

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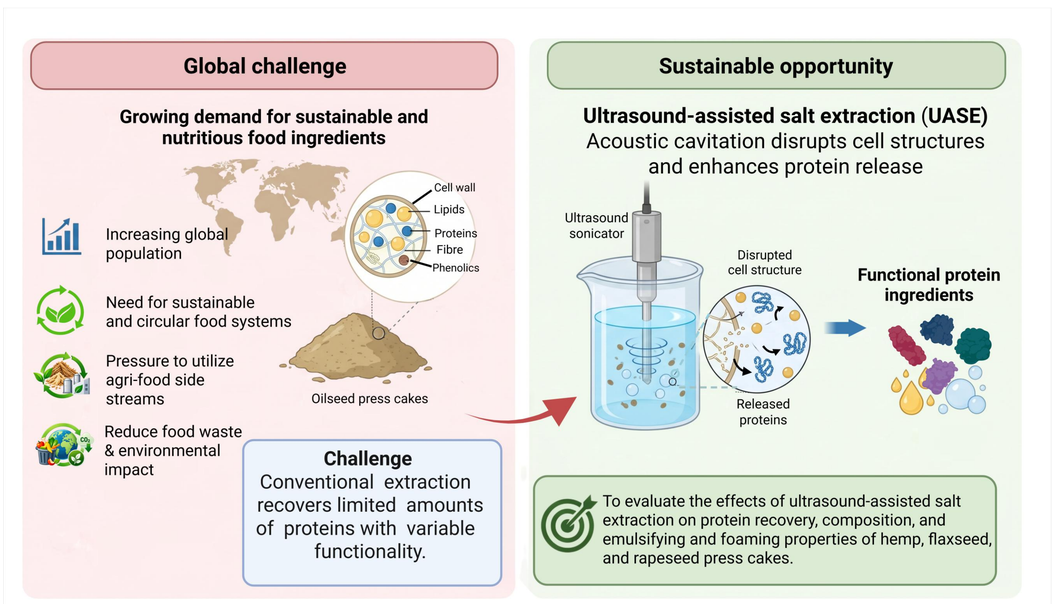
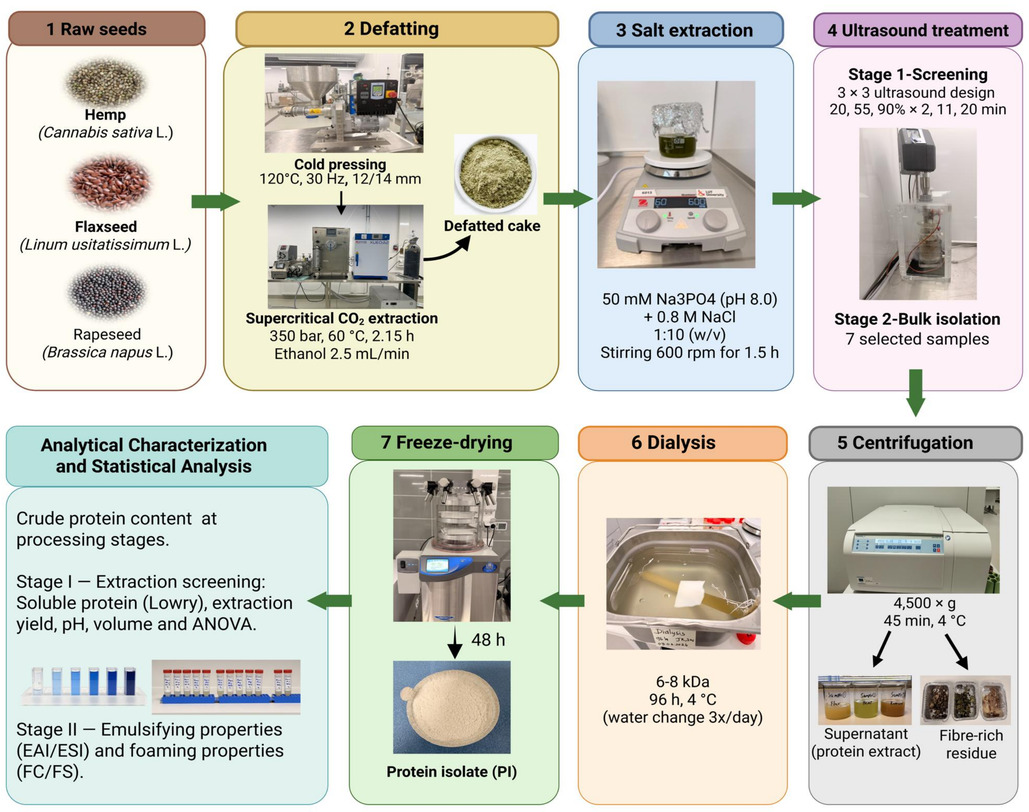
1. Introduction



2. Materials and Methods



3. Key Findings

3.1. Protein enrichment during oilseed processing

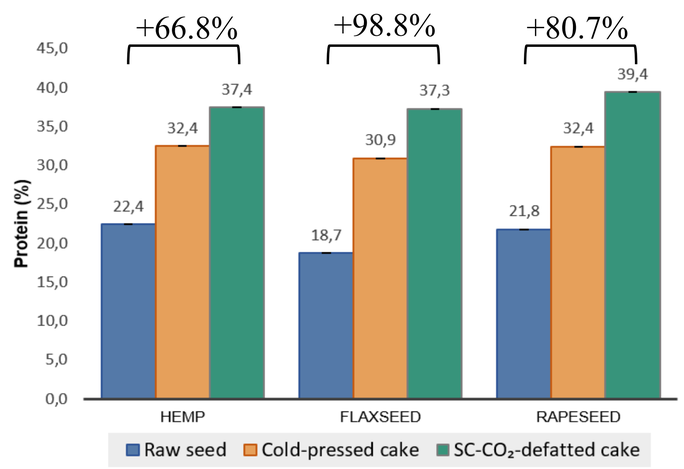


Figure 1. Crude protein content (N × 6.25) of raw seeds, cold-pressed cakes, and SC-CO_2-defatted cakes (mean ± SD).

3.2 Effect of Ultrasound on Protein Extraction

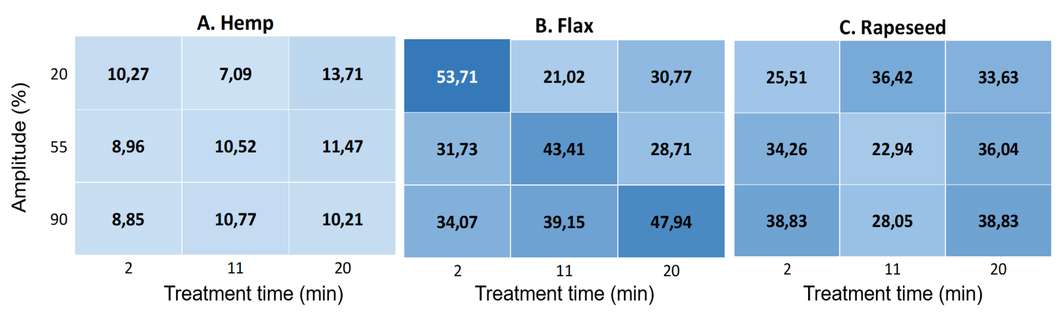
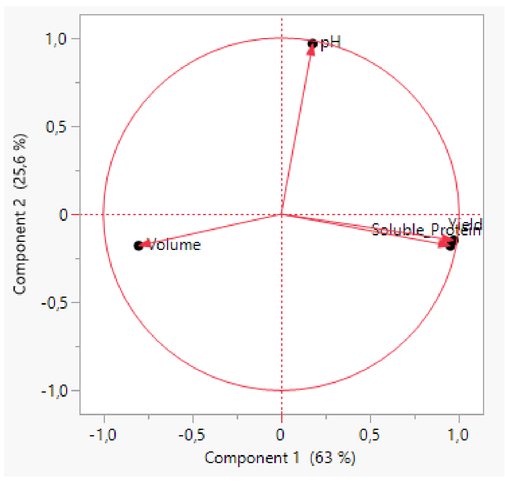


Figure 2. Effect of ultrasound amplitude and treatment time on protein extraction yield (%).

Figure 3. Principal component analysis correlation circle of protein extraction parameters.



3.3. Foaming and Emulsifying Properties

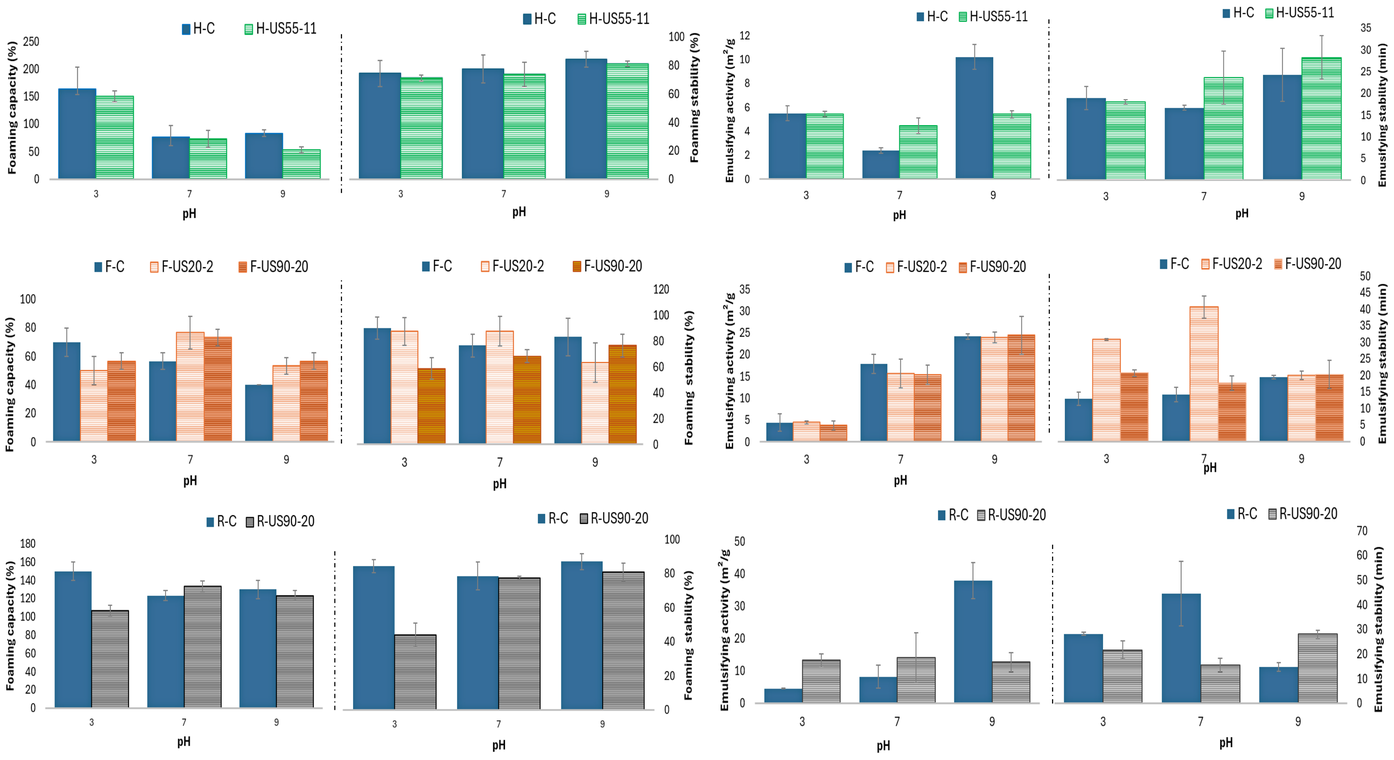


Figure 4. Foaming capacity (FC), foaming stability (FS), emulsifying activity index (EAI), and emulsion stability index (ESI) of protein isolates

4. Conclusion

- **Protein enrichment:** Flaxseed showed the greatest enrichment (+98.8%); rapeseed had the highest protein content (39.4%).
- **Protein extraction:** Flaxseed achieved the highest observed yield (53.71%) at 20% amplitude for 2 min.
- **Protein functionality:** Hemp showed the highest foaming capacity (163.3%), while rapeseed had the highest emulsifying activity (38.0 m²/g).

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