



FUNPRO

For healthy food products

Innovating Functional Foods

Project Overview

The FUNPRO project developed functional milk protein products (FMPP) by enriching goat's milk proteins with bioactive compounds from grape pomace and edible mushrooms. This innovative approach enhances food properties, nutrition, and sustainability.



Key Findings



1. Grape Pomace Extracts (GPE)

- **Rich in Phenolics:** Prokupac grape seed extract - the highest phenolic content (6467.9 mg GAE/100g DM).
- **Antioxidant Power:** Significant ABTS and DPPH activity, with catechin bioaccessibility reaching 18.16%.
- **Best Practices:** Methanol/water extraction and lyophilization preserved maximum phenolics.



2. Mushroom Extracts (ME)

- **Potent Bioactivity:** *A. aegerita* aqueous extract - superior β -glucan (34.95%) and phenolic content (23.72 g GAE/100g DW).
- **Wound Healing:** *A. aegerita* - 100% closure in 24 hours.
- **Antimicrobial Strength:** Effective against *Bacillus cereus* - notable antifungal and antibiofilm properties.



3. Goat Milk Protein Products (MPP)

- **Thermal Advantage:** Heat-treated goat milk (TRM) formed stable casein-whey complexes for bioactive integration.
- **Improved Functionality:** Enhanced emulsifying, foaming, and binding properties for versatile applications.



4. Functional Milk Protein Products (FMPP)

- **Health Benefits:** Combined GPE/ME mixtures - strong anti-inflammatory and antioxidant effects.
- **Cancer Prevention:** M/ME formulations inhibited breast and colorectal cancer cell proliferation.
- **Bioactive Delivery:** Digestive bioavailability of phenolics and glucans ensured long-lasting functional activity.

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Structural Innovations

- Spectroscopy: FTIR confirmed homogeneous bioactive integration.
- SEM Analysis: Revealed honeycomb structures in enriched products, optimizing functional performance.
- DLS measurement: Good stability of particles, unimodal distribution

Functional dehydrated soups – with addition of M/GPE, M/ME and M/GPE/ME

- Health benefits: Good antioxidant properties
- Preservative properties: Good antibacterial, antifungal and anticandidal activity
- Sensory analysis: High sensory scores – very good quality



Final Products



TRM



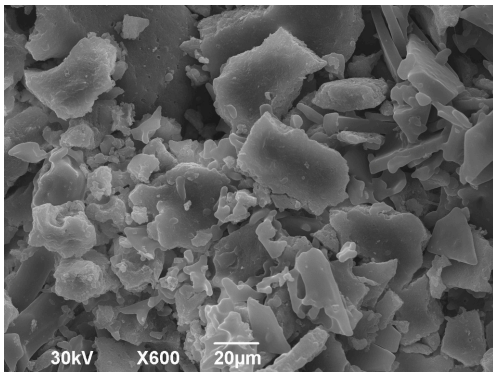
M/ME



M/GPE



M/GPE+ME



SEM of additive



Grape seed extract



Lyophilized mushroom extract



Milk + extracts



FUNPRO combined dairy proteins with plant- and mushroom-based bioactives to create innovative, health-enhancing, and sustainable food solutions.

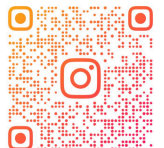


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