

# Rapeseed Protein



 [like-a-pro.eu](https://like-a-pro.eu)

 [project-like-a-pro](https://www.linkedin.com/company/project-like-a-pro)

**LIKE-A-PRO is a EU-funded project aiming to facilitate sustainable and healthy diets by mainstreaming alternative proteins and products, making them more available, accessible and acceptable.**

## Rapeseed Protein Benefits

Rapeseed protein is a by-product from rapeseed oil industry that emerges as a promising alternative to animal-based proteins. After oil extraction, a by-product called rapeseed meal or press cake remains, containing a high protein fraction (30–50%) with a balanced essential amino acid profile comparable to milk, egg, and soy.

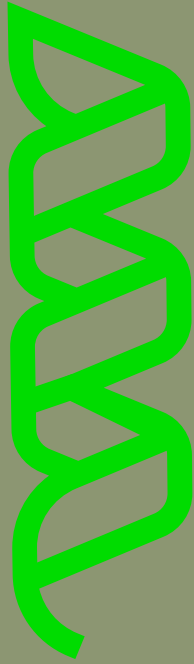


## Extraction Challenges

However, rapeseed protein has historically been underutilised due to the harsh conditions during the oil production process that led to high pressures and temperatures that denaturalise proteins and favours the presence of antinutritional factors (e.g., glucosinolates and tannins).



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## Optimised Extraction Process

As part of LIKE-A-PRO project, **FRAUNHOFER** optimised rapeseed protein fractionation at pilot scale to enhance sensory and nutritional quality and reduce antinutritional compound's presence. This was achieved through the development and scale-up of **EthaNa**, an innovative fractionation process that replaces conventional hexane extraction with food-grade ethanol, eliminating the use of toxic and environmentally hazardous solvents. In addition, EthaNa operates at lower temperatures ( $\leq 60$  °C) and ambient pressure, avoiding protein denaturation and preserving functional and nutritional properties. Compared to traditional hexane extraction, the process offers improved protein quality, enhanced safety for food applications and reduced environmental impact.

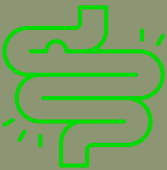


*EthaNa process was proven as a novel green biorefinery concept for rapeseed processing that couples high-quality oil extraction with the valorisation of rapeseed meal with the following characteristics:*



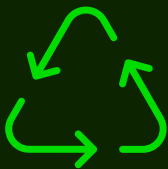
### High technical feasibility

Able to process de-hulled rapeseed kernels under mild ethanolic conditions to produce a >50% protein concentrate with **low glucosinolate** levels and **preserved functionality**.



### Strong nutritional value and functionality

Balanced amino acid profile, presence of health-promoting compounds and functional versatility for use in fish analogues, 3D-printed foods, hybrid meats and smoothies.



### Sustainability

EthaNa process delivers environmental advantages against traditional extraction with hexane as ethanol is a renewable solvent. Operating at ambient pressure and lower temperatures reduce energy consumption and associated emissions. In addition, this process can achieve 95% of biomass revalorisation, minimising waste from rapeseed oil production.



### Affordability

Driven by a multi-product portfolio through the co-production of rapeseed protein ingredients alongside hulls, sinapin, lecithin, and oil. This integrated valorisation improves process economics to a selling price of €1.00/kg for the protein ingredient, with a selling price of €0.77/kg across all co-products achieving a capacity of 47.6 tonnes/day. Based on these assumptions, the process is projected to achieve profitability within five years (short-term return of investment).

To translate this technical innovation into market uptake, Fraunhofer's business model is centred on **licensing** the EthaNa technology to rapeseed oil processors as the primary customer segment. Market conditions are favourable, with the rapeseed meal market projected to grow at a Compound Annual Growth Rate (CAGR) of 6.1% between 2025 -2035, supporting wide deployment of the process. With continued upscaling, strategic partnerships, targeted investment, and successful Novel Food authorisation of the protein ingredient, the EthaNa process is expected to reach full commercial readiness within approximately eight years.

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