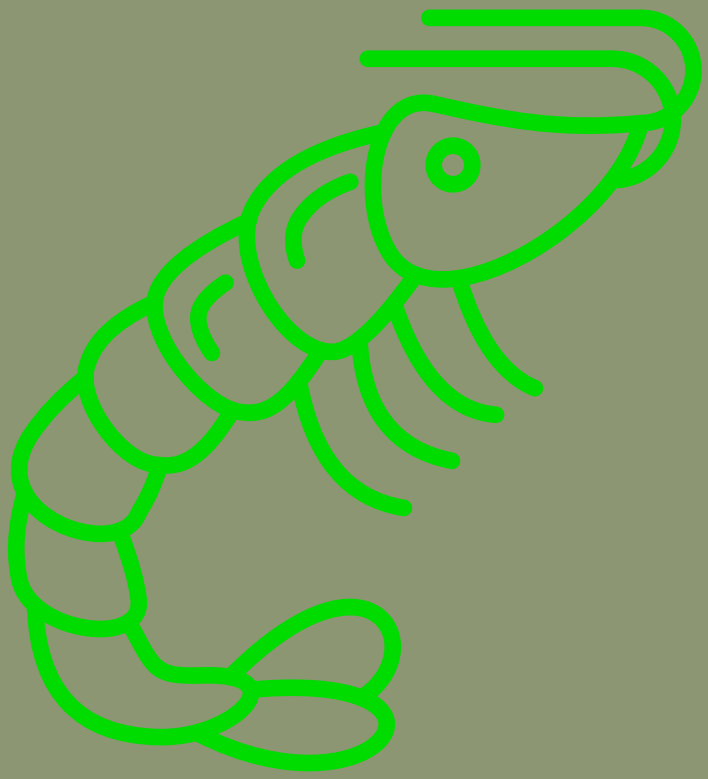


Krill Protein

Like a PRO

like-a-pro.eu

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.

Krill Protein Benefits

Krill protein (Euphausia superba) derived from Antarctic shrimp-like crustaceans (Figure 1) is rich in omega-3 phospholipids, vitamins, and minerals, with a similar profile to egg. It is gaining attention as a sustainable, high-value alternative to fish-derived proteins.

Extraction Challenges

However, its application in human food remains constrained by fluorine residues presence, high salt content and the formation of trimethylamine (TMA) and trimethylamine N-oxide (TMAO), causing off-odour and health concerns. Therefore, this protein is mainly diverted to animal feeding for pets, fish and prawns.

Funded by the European Union

Optimised Extraction and Filtration Process

As part of LIKE-A-PRO project, **RIMFROST**, **MOREFORESKING** and **CELABOR** optimised the krill protein extraction process through controlled enzymatic hydrolysis followed by purified onshore using sequential membrane filtration. The aim was to reduce salts and low-molecular-weight off-flavour compounds (TMA/TMAO) to improve both protein quality and functionality for human consumption.

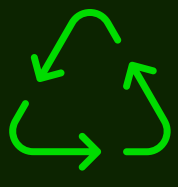
As a result, an innovative marine protein ingredient was obtained that preserves its nutritional integrity and exhibits the following key characteristics:

Superior functional performance

Strong solubility, proven **emulsifying capacity**, and **oil-binding ability**, supporting **stable textures** and **appealing mouthfeel** for the development of food products such as seafood analogues, high-protein beverages, emulsified products, and fortified foods.

High nutritional value with bioactive potential

~70% protein concentrate with a balanced amino acid profile high in lysine, arginine, branched amino acids and potential bioactive peptides. This unique and balanced composition together with high digestibility and overall bioavailability, makes it relevant as an ingredient in functional and fortified food formulations. Significant reduction of compounds associated with off odours (e.g., TMAO, TMA) were achieved.



Sustainability

Strong environmental sustainability by integrating mild enzymatic hydrolysis with **low-impact**, **solvent-free purification technologies**.

Affordability

The optimised process achieved a non-labour cost of only €0.89 per kg, representing an over 80% reduction in unit cost, attributed to s**horter processing times** and **lower energy consumption**.

The market strategy is to position krill protein as a premium, marine ingredient that combines high functional performance, nutritional value, and sustainability. This is supported by favourable market dynamics as the marine-derived protein market is projected to grow at a Compound Annual Growth Rate (CAGR) of over 8.5% between 2025 and 2034. These attributes position marine proteins as premium ingredients for the rapidly expanding health and wellness sector, with the global Antarctic krill market valued at € 1.45 billion in 2023, with forecasts indicating double-digit annual growth.

The technical optimisation achieved within LIKE-A-PRO demonstrated that high-quality krill protein can be produced with improved functionality, sensory profile, and stability. As a result, krill protein emerges as a commercially attractive, high-value marine ingredient capable of competing in premium food and nutraceutical markets while aligning with sustainability and blue bioeconomy objectives.

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