Affordable DHA Without Fish Oil or Algae?

DHA is essential for maternal and child nutrition – but today's sources are often too costly. acib is developing a circular fermentation platform that converts brewery side streams into a stable, protein-rich yeast ingredient enriched with DHA and other micronutrients. The goal: affordable, vegan, locally producible nutrition without relying on fish oil or algae supply chains.

BACKGROUND

DHA (docosahexaenoic acid) is essential for early-life development, maternal health, normal brain function, vision, and plays an important role in several metabolic processes. Staple-based diets can be low in DHA, leaving a persistent nutrient gap. However, access to high-quality nutrient sources such as fish oil, algae-derived DHA or fortified products remains limited due to high costs.

At the same time, breweries generate large volumes of nutrient-rich side streams that are often underused. acib combines these two problems into one opportunity: locally available brewery residues become a fermentation feedstock for a stable, nutrient-dense yeast ingredient. The concept is designed for low CAPEX, use of existing fermentation infrastructure, and local technology transfer.

TECHNOLOGY

acib aims to develop a fermentation platform using the oleaginous yeast *Yarrowia lipolytica*, specially adapted to brewery-residue-based media. The process combines enzymatic pretreatment of brewery residues, strain development, and fermentation optimization to generate a stable, whole-cell yeast ingredient enriched in DHA.

The concept includes engineering *Y. lipolytica* for DHA accumulation via a multi-enzyme pathway. Laboratory evolution and process optimization are used to improve robustness on real brewery-derived media.

acib offers:

- Yeast strain development for DHA production
- Enzymatic pretreatment of brewery residues as fermentation media
- Screening and adaptation to partner-specific side streams
- Bench-scale fermentation and process optimization
- Harvesting, cell disruption and drying toward a stable yeast powder
- Analytics for DHA, quality and process KPIs
- Technology-transfer for brewery and/or food-production partners

OFFER

For companies facing pressure to reduce ingredient costs, secure alternative DHA supply chains and build credible circular nutrition products, we offer to co-develop this technology as an affordable, vegan and sustainable single yeast-based ingredient, supporting cleaner and simpler ingredient declarations.

IP generated can be fully transferred to company partners.

EXPERTS

Dr. Petra Heidinger

DEVELOPMENT STATUS:

Status of the project proposal – Technology Readiness Level 2 (technology concept formulated)

KEYWORDS

- Affordable nutrition
- DHA fermentation
- *Yarrowia lipolytica*
- Brewery side streams
- Brewers' spent grain
- Circular food ingredients
- Maternal and child nutrition
- Functional foods
- LMIC nutrition
- Fermentation-based supplements
- Technology transfer
- Local production
- Sustainable biomanufacturing

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