

TECH OFFER

Formulation and Optimisation of Fish (*O. niloticus*) Feed from Food Waste Protein Source



KEY INFORMATION

TECHNOLOGY CATEGORY:

Sustainability - Circular Economy

Waste Management & Recycling - Food & Agriculture

Waste Management

TECHNOLOGY READINESS LEVEL (TRL): **TRL3**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175378**

OVERVIEW

The aquaculture industry is facing rising costs of conventional feed. Premium protein sources such as fishmeal and fish oil are highly price-volatile due to fluctuating supply and demand, and reliance on imported feed further increases costs. Another key challenge is the growing volume of food waste. A survey of local food processing companies conducted between August 2022 and June 2023 identified approximately 174,300 tonnes of homogeneous food waste, highlighting the scale of the problem.

This technology offers a sustainable aquafeed solution by converting by-products from soy sauce production, fish processing, and bread waste into nutritionally balanced feed for tilapia (*O. niloticus*), delivering a sustainable fish feed formulation for tilapia that maintains optimal growth performance while reducing dependency on conventional, expensive feed ingredients. With rising pressures on feed manufacturers and fish farms to meet environmental goals, this platform supports circular agriculture by turning food waste into valuable inputs and reinforcing a sustainable fish feed formulation for tilapia approach.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technical specifications and features of the solution are as follows:

- **Processing:** Transforms readily available soy press cake, fish processing waste and bread into aquafeed through low-shear mixing, fermentation, spheronization and pelletization.
- **Formulation:** Provides feed formulation designed specifically for tilapia, incorporated with essential proteins, amino acids, carbohydrates, lipids, vitamins, and minerals.
- **Pellet properties:** Produces water-stable sinking pellets with enhanced physical stability and controlled nutrient leaching properties
- **Quality control:** Ensures consistency through physical profiling, nutritional analysis

POTENTIAL APPLICATIONS

This feed has been formulated for tilapia, but is open to reformulation to allow opportunities in:

- Feed for other types of fish species
- Ingredient for further development of fish feed
- Development of feed for other animals whether it is farm or pets
- Upcycling of food waste into higher value products

UNIQUE VALUE PROPOSITION

- Accelerate the R&D cycle and start with a proven sustainable aquafeed formulation that delivers better growth at a lower price
- Reduces feed costs through the utilisation of low-cost waste ingredients
- Supports circular economy by converting food waste into valuable resources
- Provides nutritionally complete feed specifically formulated for tilapia
- Contributes to meeting sustainable certification standards like ASC (Aquaculture Stewardship Council) or BAP (Best Aquaculture Practices)